

FROZEN SEA CREATURES AND METHOD OF FREEZING SEA CREATURES

This application claims priority from South African Patent Application No. 2006/04697 filed on 8 June 2006 in the name of Rob Arthur LLOYD, the contents of which is incorporated
5 herein in its entirety as if specifically reproduced.

Field of the Invention

The invention relates to frozen sea creatures and to a method of freezing sea creatures.
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Background to the Invention

The inventor is aware that presently, smaller fish such as pilchards, mackerel and maasbanker, weighing between 60g and 900g per fish are frozen in bulk and sold in packs
15 of several fish stuck together in the freezing process resulting in wastage when the fish are to be used individually. A typical pilchard or mackerel of this type weighs between 80g and 320g, with an average pilchard weighing from 100g to 120g and an average mackerel weighing from 100g to 300g each. An average maasbanker may weigh 800g.

20 Parting frozen pilchards leads to the skins being stripped from the pilchards or damage to the pilchards with resultant losses.

The same can be said for other fish and even crayfish (a crustacean).

25 Thus, the inventor proposes a solution which should at least reduce the wastage discussed above.

Summary of the Invention

30 According to a first aspect of the invention, there is provided a method for freezing sea creature weighing from 60g to 900g each, said method including the step of:

- chilling a substantially whole sea creature to firm it up in preparation for freezing; and
- individually freezing said sea creature so that the frozen sea creature remains separate from any other sea creature being frozen contemporaneously.

The chilling may be by immersing the sea creature in an aqueous bath at a temperature below -0 deg C, typically around -2 deg C.

5 The sea creature may be selected from:

<i>Common Name</i>	<i>Scientific Name</i>
Pilchard, Sardine	Sardinops Ocellatus
Red Eye Sardine	Etrumeus Teres
Squid, Chokka, Tjokka	Loligo Vulgaris Reynaudii
Mackerel, Slimy, Chub Mackerel	Scomber Japonicus
Maasbanker, Horse Mackerel, Scad	Trachurus Trachurus
Prawn, Swimming Prawn, Tiger Prawn	Penaeus Monodon
West Coast Crayfish	Jasus Ialandii
South Coast Crayfish	Palinurus Gilchristi
East Coast Crayfish	Panulirus Homarus
Shad, Elf, Blue Fish, Tailor	Pomatomus Saltatrix
Santer, Soldier	Chelmerius Nufar

The aqueous bath may be a salt water bath.

10 The salt water bath may be a sea water bath with additional salt added.

The bath may include ice.

The individual freezing may include one or more of the following steps:

- 15
- hanging said sea creatures individually, typically by the tail;
 - spacing said sea creatures from each other to facilitate circulation of a freezing medium between said creatures;
 - translocating said sea creature through a blast freezer;
 - blasting freezing air at below -30 deg C between and around said sea creatures to
 - 20 individually freeze them; and
 - maintaining said air flow for at least 2 minutes, typically around 10 minutes to reduce freezer burn.

25 The sea creature may be hung from a chain conveyor chain by a clip, or the like, which chain conveyor provides for the translocation of the sea creature through the blast freezer for individual freezing.



The chain conveyor may be a stainless steel chain conveyor.

5 The clips may be spaced 100 mm apart along the chain conveyor thereby providing for the spacing between the said sea creatures during freezing thereof.

The method may include placing said sea creatures in individual tubes.

10 The sea creatures may be placed in tubes after a preliminary freezing step and returned to the individual freezing process for final freezing in individual tubes.

The sea creatures may be finally frozen before being placed in individual tubes and placed into refrigerated storage.

15 An alternative method of individually freezing the sea creatures includes:

- placing sea creatures individually in plastic tubes or sleeves;
- packing said sea creatures onto a tray;
- passing said tray through a freezer thereby to freeze the sea creatures while inhibiting freezer burn.

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The sea creatures may be placed in the tubes or sleeves prior to firming up thereof by chilling.

A typical sea creature of this type may have a mass of from 80g to 900g.

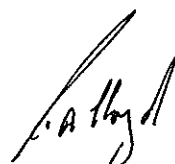
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A typical sea creature of this type may be a fish such as a pilchard, a mackerel, or a maasbanker.

30 An average pilchard may have a mass from 100g to 120g and an average mackerel may have a mass of from 100g to 300g each.

An average maasbanker may have a mass of from 250g to 800g.

The tube may be semi-rigid so that it is similar to a length of pipe sized and dimensioned



to receive said single whole sea creature therein.

The tube may be flexible so that it is similar to an elongate bag sized and dimensioned to receive said single whole sea creature therein.

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The tube may be made from polyethylene sheeting.

The freezing may be by means of a blast of refrigerated air, such as that used in known IQF processes, thereby to maintain the integrity of the sea creature including bodily fluids
10 thereof.

The invention extends to a production line using one of the methods as described above.

According to a second aspect of the invention, there is provided a single substantially
15 whole frozen pilchard sized sea creature, said frozen sea creature being located within a tube which separates said frozen sea creature from all other frozen sea creatures in its proximity.

The tube may be semi-rigid so that it is similar to a length of pipe sized and dimensioned
20 to receive said single whole sea creature therein.

The tube may be flexible so that it is similar to an elongate bag sized and dimensioned to receive said single whole sea creature therein. Thus the tube may be sleeve.

25 The tube may be made from polyethylene sheeting.

The sea creature may be selected from:

<i>Common Name</i>	<i>Scientific Name</i>
Pilchard, Sardine	Sardinops Ocellatus
Red Eye Sardine	Etrumeus Teres
Squid, Chokka, Tjokka	Loligo Vulgaris Reynaudii
Mackerel, Slimy, Chub Mackerel	Scomber Japonicus
Maasbanker, Horse Mackerel, Scad	Trachurus Trachurus
Prawn, Swimming Prawn, Tiger Prawn	Penaeus Monodon
West Coast Crayfish	Jasus Ialandii
South Coast Crayfish	Palinurus Gilchristi
East Coast Crayfish	Panulirus Homarus



<i>Common Name</i>	<i>Scientific Name</i>
Shad, Elf, Blue Fish, Tailor	Pomatomus Saltatrix
Santer, Soldier	Chelmerius Nufar

The freezing may be by means of a blast of refrigerated air, such as that used in known IQF processes, thereby to maintain the integrity of the sea creature including bodily fluids
5 thereof.



The invention extends to a frozen pack of sea creatures each having a mass of from 60g to 900g, said pack including one or more substantially whole sea creatures, each in a separate tube which maintains the individual character of each said sea creature in the pack and permits easy separation thereof from the remainder of the pack.

The sea creatures in the pack may be selected from:

<i>Common Name</i>	<i>Scientific Name</i>
Pilchard, Sardine	Sardinops Ocellatus
Red Eye Sardine	Etrumeus Teres
Squid, Chokka, Tjokka	Loligo Vulgaris Reynaudii
Mackerel, Slimy, Chub Mackerel	Scomber Japonicus
Maasbanker, Horse Mackerel, Scad	Trachurus Trachurus
Prawn, Swimming Prawn, Tiger Prawn	Penaeus Monodon
West Coast Crayfish	Jasus Ialandii
South Coast Crayfish	Palinurus Gilchristi
East Coast Crayfish	Panulirus Homarus
Shad, Elf, Blue Fish, Tailor	Pomatomus Saltatrix
Santer, Soldier	Chelmerius Nufar

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The frozen pack may include a single sea creature, for example, a single mackerel, a single pilchard, or a single maasbanker sold for human consumption.

5 Where possible, the pack may conveniently be a 500 g pack, however, the pack may be any pack sized desired by the consumer.

The inventor believes that the method of freezing said sea creatures and the sea creatures frozen by said method and disposed of in packs of the invention will substantially reduce
 20 wastage, maintain firmness of the individual sea creatures, improve packing efficiency, and generally contribute to economic use of a valuable natural resource.

Specific Description of the Invention

25 The invention will now be described by way of non-limiting example only, with reference to the accompanying diagrammatic drawings. In the drawings,

Figure 1 shows a pilchard individually frozen as a single whole fish in a tube in accordance with the invention;

5 Figure 2 shows a process for individually freezing a pilchard or a mackerel in accordance with the invention; and

Figure 3 shows another embodiment of a process for individually freezing sea creatures in accordance with the invention.

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In Figure 1, reference numeral 10 generally indicates a frozen pilchard broadly in accordance with the invention.

The pilchard 10 is in a polyethylene tube 12 which is sealed at one end 14.

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The pilchard 10 is frozen by a blast of -40 deg C air in a blast freezer.

The pilchard 10 retains its integrity and its body fluids when frozen.

20 In Figure 2, reference numeral 20 indicates a production line using a method broadly in accordance with the invention.

25 In the production line 20, pilchards 22, each having a mass of between 80g and 140g, are received from a fisherman and placed in 1 ton batches 24 in plastic boxes 26 in sea water and salt at a temperature of about -2 deg C. This firms up the pilchards 22 and prepares them for individual quick freezing (IQF) while keeping them separate.

The pilchards 22 are then selected by hand and attached to a stainless steel conveyor chain 28 of the line 20.

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The pilchards 22 are clipped by clips 30 to hang by their tails from the chain 28 with individual pilchards 22 spaced approximately 100 mm apart.

The conveyor 28 transports the hanging pilchards 22 through a blast freezer 32 in which

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freezing air at about -40 deg C is blasted at the pilchards 22 for about 10 minutes whereafter the semi-frozen pilchards 22 leave the blast freezer and are placed in individual polyethylene tubes 34 before being returned for final freezing and hardening.

- 5 The individually frozen pilchards 22 in tubes 34 are placed into cold storage ready for sale either individually or in packs for human consumption or for use as bait.

In Figure 3, reference numeral 40 indicates a production line using a method broadly in accordance with the invention.

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In the production line 40, pilchards 22, each having a mass of between 80g and 140g, are received from a fisherman and a placed in 1 ton batches 24 in plastic boxes 26 in sea water and salt at a temperature of about -2 deg C. This firms up the pilchards 22 and prepares them for individual quick freezing (IQF) while keeping them separate.

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The pilchards 22 are then selected by hand and placed in individual ployethylene tubes 42.

20 The pilchards 22 in tubes 42 are placed side by side on trays 50 before being passed through a blast freezer 32 in which freezing air at about -40 deg C is blasted at the pilchards 22 to freeze them in their tubes while inhibiting freezer burn.

The individually frozen pilchards 22 in tubes 42 are placed into cold storage ready for sale either individually or in packs for human consumption or for use as bait.

Claims

1. A method for freezing a sea creature having a mass of from 60g to 900g each, said
5 method including the step of:
 - chilling a substantially whole sea creature to firm it up in preparation for freezing; and
 - individually freezing said sea creature so that the frozen sea creature remains separate from any other sea creature being frozen contemporaneously.
- 10 2. A method as claimed in claim 1, wherein the chilling is by immersing the sea creature in an aqueous bath at a temperature below 0 deg C.
3. A method as claimed in claim 2, wherein the aqueous bath is a salt water bath.
- 15 4. A method as claimed in claim 3, wherein the salt water bath is a sea water bath with additional salt added which is cooled to around - 2 deg C.
5. A method as claimed in any one of the preceding claims, wherein the individual freezing includes one or more of the following steps:
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 - hanging said sea creatures individually;
 - spacing said sea creatures from each other to facilitate circulation of a freezing medium between said creatures;
 - translocating said sea creature through a blast freezer;
 - blasting freezing air at below -30 deg C between and around said sea creatures to
25 individually freeze them; and
 - maintaining said air flow for at least 2 minutes.
6. A method as claimed in claim 5, wherein the sea creature is hung by its tail from a chain conveyor chain by a clip which chain conveyor provides for the translocation of the
30 sea creature through the blast freezer for individual freezing, which clip spaced about 100 mm along the chain conveyor from an adjacent clip.
7. A method as claimed in any one of the preceding claims, which includes placing said sea creatures in individual tubes.



8. A method as claimed in claim 5 or claim 6, wherein the sea creatures are placed in tubes after a preliminary freezing step and returned to the individual freezing process for final freezing in individual tubes.

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9. A method as claimed in claim 7, wherein the sea creatures are finally frozen before being placed in individual tubes and placed into refrigerated storage.

10. A method as claimed in any one of claims 1 to 4, said method including:

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- placing said sea creatures individually in plastic tubes or sleeves;
 - packing said tubed or sleeved sea creatures onto a tray;
 - passing said tray through a freezer thereby to freeze the sea creatures while inhibiting freezer burn.

15 11. A method as claimed in claim 10, wherein the sea creatures are placed in the tubes or sleeves prior to firming up thereof by chilling.

12. A method as claimed in any one of the preceding claims, wherein the sea creature is a fish having a mass of from 80g to 320g.

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13. A method as claimed in claim 7, 8, 10, or claim 11, wherein the tube is semi-rigid so that it is in the form of a length of pipe sized and dimensioned to receive said single whole sea creature therein.

25 14. A method as claimed in claim 7, 8, 10, or claim 11, wherein the tube is flexible so that it is in the form of an elongate bag sized and dimensioned to receive said single whole sea creature therein.

30 15. A method as claimed in any one of claims 13 or 14, wherein the tube is made from polyethylene sheeting.

16. A method as claimed in any one of the preceding claims, wherein the sea creature is selected from the sea creatures appearing in the table which follows:



<i>Common Name</i>	<i>Scientific Name</i>
Pilchard, Sardine	Sardinops Ocellatus
Red Eye Sardine	Etrumeus Teres
Squid, Chokka, Tjokka	Loligo Vulgaris Reynaudii
Mackerel, Slimy, Chub Mackerel	Scomber Japonicus
Maasbanker, Horse Mackerel, Scad	Trachurus Trachurus
Prawn, Swimming Prawn, Tiger Prawn	Penaeus Monodon
West Coast Crayfish	Jasus Ialandii
South Coast Crayfish	Palinurus Gilchristi
East Coast Crayfish	Panulirus Homarus
Shad, Elf, Blue Fish, Tailor	Pomatomus Saltatrix
Santer, Soldier	Chelmerius Nufar

- 5 17. A production line using the method of any one of the preceding claims.
18. A single substantially whole frozen sea creature having a mass of from 60g to 900g, said frozen sea creature being located within a tube which separates said frozen sea creature from all other frozen sea creatures in its proximity.
- 10 19. A single substantially whole frozen sea creature as claimed in claim 18, wherein the tube is semi-rigid so that it is in the form of a length of pipe sized and dimensioned to receive said single whole sea creature therein.
- 15 20. A single substantially whole frozen sea creature as claimed in claim 18, wherein the tube is flexible so that it is in the form of an elongate bag sized and dimensioned to receive said single whole sea creature therein.
- 20 21. A single substantially whole frozen sea creature as claimed in any one of claims 18 to 20, wherein the tube is made from polyethylene sheeting.
22. A single substantially whole frozen sea creature as claimed in any one of claims 18 to 21, wherein the sea creature is selected from the sea creatures in the table which follows:

<i>Common Name</i>	<i>Scientific Name</i>
Pilchard, Sardine	Sardinops Ocellatus

<i>Common Name</i>	<i>Scientific Name</i>
Red Eye Sardine	Etrumeus Teres
Squid, Chokka, Tjokka	Loligo Vulgaris Reynaudii
Mackerel, Slimy, Chub Mackerel	Scomber Japonicus
Maasbanker, Horse Mackerel, Scad	Trachurus Trachurus
Prawn, Swimming Prawn, Tiger Prawn	Penaeus Monodon
West Coast Crayfish	Jasus Ialandii
South Coast Crayfish	Palinurus Gilchristi
East Coast Crayfish	Panulirus Homarus
Shad, Elf, Blue Fish, Tailor	Pomatomus Saltatrix
Santer, Soldier	Chelmerius Nufar

23. A single substantially whole frozen sea creature as claimed in any one of claims 18 to 21, wherein the sea creature is a crustacean.

5 24. A single substantially whole frozen sea creature as claimed in any one of claims 18 to 23, wherein the sea creature has a mass of from 250g to 900g.

25. A single substantially whole frozen sea creature as claimed in any one of claims 18 to 23, wherein the sea creature has a mass of from 95g to 125g.

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26. A single substantially whole frozen pilchard sized sea creature as claimed in any one of claims 18 to 23, wherein the sea creature has a mass of from 290g to 330g.

15 27. A single substantially whole frozen pilchard sized sea creature as claimed in any one of claims 18 to 26, wherein the freezing is by means of a blast of refrigerated air thereby to maintain the integrity of the sea creature including bodily fluids thereof.

20 28. A frozen pack of sea creatures, said pack including one or more substantially whole sea creatures, each in a separate tube which maintains the individual character of each said sea creature in the pack and permits easy separation thereof from the remainder of the pack.

29. A frozen pack as claimed in claim 28, which is in the form of a 500 g pack of sea creatures.

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30. A frozen pack as claimed in claim 28, which is in the form of a 1000 g pack of sea

creatures.

31. A frozen pack as claimed in claim 28, which is in the form of a 5000 g pack of sea creatures.

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32. A frozen pack as claimed in any one of claims 28 to 31, wherein the sea creature is selected from:

<i>Common Name</i>	<i>Scientific Name</i>
Pilchard, Sardine	Sardinops Ocellatus
Red Eye Sardine	Etrumeus Teres
Squid, Chokka, Tjokka	Loligo Vulgaris Reynaudii
Mackerel, Slimy, Chub Mackerel	Scomber Japonicus
Maasbanker, Horse Mackerel, Scad	Trachurus Trachurus
Prawn, Swimming Prawn, Tiger Prawn	Penaeus Monodon
West Coast Crayfish	Jasus Ialandii
South Coast Crayfish	Palinurus Gilchristi
East Coast Crayfish	Panulirus Homarus
Shad, Elf, Blue Fish, Tailor	Pomatomus Saltatrix
Santer, Soldier	Chelmerius Nufar

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33. A method for freezing a pilchard size sea creature as claimed in claim 1, substantially as herein described and illustrated.

34. A production line as claimed in claim 17, substantially as herein described and illustrated.

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35. A single substantially whole frozen pilchard sized sea creature as claimed in claim 18, substantially as herein described and illustrated.

20 36. A frozen pack as claimed in claim 28, substantially as herein described and illustrated.

37. A new method, a new production line, a new single substantially whole frozen pilchard sized sea creature, or a new frozen pack substantially as herein described.

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Signed this 28 day of July 2006 at Pretoria



J F Luterek
Patent Attorney for Applicant

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