Claims

1. A production method of caviar or a caviar-like product from live, mature, ovulated eggs from fish or crustaceans, which have three or more layers in an egg envelope, wherein the live, mature, ovulated eggs are in a fertile but unfertilized state and have a natural potassium content in an egg plasma, wherein the caviar or a caviar-like product comprises an elastic stabilizing layer (SS) that is formed in the egg envelope between the zona radiata interna (ZRI) and the alveolar layer (AL) or between the zona radiata externa (ZRE) and the alveolar layer (AL), wherein the elastic stabilizing layer is an eosinophilic and hyaline layer in which glucosaminogycans are incorporated, the method comprising: -

treatment of the live, mature, ovulated eggs with a 0.6 percent to 1.0 percent a saline solution to remove ovulation fluid and subsequently, in a potassium exposure step, with a potassium-containing solution which acts to stabilize the egg envelope of the live, mature, ovulated eggs,

wherein in the potassium exposure step, the potassium-containing solution comprises potassium dissolved in deionized water in a concentration of potassium cations of between 0.1 mmol/l and 3.0 mmol/l, wherein prior to the addition of a potassium donor for the formation of the potassium cations, the deionized water is at a temperature in the natural spawning temperature range for the fish and crustaceans of between 1ºC and 29ºC, and wherein the live, mature, ovulated eggs are treated in the potassium-containing solution for a potassium exposure time of between 5 min to 30 min, and finally, dipping of the live, mature, ovulated eggs in a 0.6 percent to 1.0 percent saline solution.

2. The method according to claim 1,
wherein the potassium donor employed is at least one potassium salt, and wherein said at least potassium salt is a salt of citric acid, salt of hydrochloric acid, salt of sorbic acid, or any combination thereof.

3. The method according to claim 1 or 2,
wherein the concentration of the potassium cations in the potassium-containing solution is 0.1 mmol/l, 0.5 mmol/l, 0.65 mmol/l, 1.6 mmol/l or 2.0 mmol/l.

4. The method according to claim 1 or claim 2,
wherein the concentration of the potassium cations in the potassium-containing solution is 1.0 mmol/l or 1.5mmol/l.

5. The method according to any one of claims 1 to 4,
wherein the potassium exposure time in the potassium exposure step is 10 min, 12 min, 15 min, 20 min or 25 min.

6. The method according to any one of claims 1 to 5,
wherein the temperature of the potassium-containing solution in the potassium exposure step in a polar temperature range is between 1ºC and 15ºC or between 5ºC and 12ºC, in a moderate temperature range is between 10ºC and 20ºC, or in a tropical temperature range is between 20ºC and 29ºC.

7. The method according to claim 6,
wherein the temperature of the potassium-containing solution in the potassium exposure step in the polar temperature range is 10ºC.

8. The method according to claim 6,
wherein the temperature of the potassium-containing solution in the potassium exposure step in the moderate temperature is 15ºC or 12ºC.

9. The method according to claim 6,
wherein the temperature of the potassium-containing solution in the potassium exposure step in the tropical temperature is 27ºC or 21ºC.

10. The method according to any one of claims 1 to 9,
wherein the potassium-containing solution in the potassium exposure step has a pH of between 6.8 and 8.0 or between 7.0 and 7.9.

11. The method according to any one of claims 1-9,
wherein the potassium-containing solution in the potassium exposure step has a pH of 7.2, 7.4 or 7.5.

12. The method according to any one of claims 1 to 11,
which further comprises a calcium exposure step in a calcium-containing solution, wherein calcium donor is dissolved in deionized water to provide a concentration of calcium cations of between 0.1 mmol/l and 3mmol/l, wherein prior to the addition of the calcium donor for the formation of the calcium cations, the deionised water is at a temperature of between 1ºC and 29ºC which is in the natural spawning temperature range for fish and crustaceans, and wherein the live, nature, ovulated eggs are treated in the calcium-containing solution for a calcium exposure time of between 9 min and 30 min,
wherein the calcium exposure step is carried out either before the potassium exposure step or after the potassium exposure step but before carrying out the step of dipping of the live, mature, ovulated eggs in a 0.6 percent to 1.0 percent saline solution.

13. The method according to claim 12,
wherein the calcium donor employed is calcium citrate, calcium chloride, calcium sorbate, or any combination thereof.

14. The method according to claim 12 or 13,
wherein the concentration of the calcium cations in the calcium-containing solution in the calcium exposure step is 0.5 mmol/l, 0.8 mmol/l, 1.0 mmol/l, 1.5 mmol/l, 1.6 mmol/l or 2.0 mmol/l.

15. The method according to any one of claims12 to 14,
wherein the calcium exposure time in the calcium exposure step is 10 min, 12.5 min, 15 min, 16 min, 20 min or 25 min.

16. The method according to any one of claims 12 to 15,
wherein the temperature of the calcium-containing solution in the calcium exposure step is in a polar temperature range is between 1°C and 15°C, or between 5°C and 12°C, in a moderate temperate range between 10°C and 20°C, or a tropical temperature range between 20°C and 29°C.

17. The method according to claim 16,

wherein the temperature of the calcium-containing solution in the calcium exposure step in a polar temperature range is 10ºC, in a moderate temperature range is between 15ºC or 12ºC, or in a tropical temperature range is 27ºC or 21ºC.

18. The method according to any one of claims 12 to 17,
wherein the calcium-containing solution in the calcium exposure step has a pH of between 6.8 and 8.0, between 7.0 and 7.9, or has a pH of 7.2, 7.4, or 7.5.

19. The method according to any one of the claims 1-18,
wherein the deionized water has an electrical conductivity at 25°C between 1 µS/cm and 15 µS/cm.

20. The method according to claim 19,
wherein the deionized water has an electrical conductivity of 1 µS/cm.

21. The method according to any one of claims 12 to 20,
wherein the calcium-containing solution has a pH between 7.0 and 7.9.

22. The method according to claim 21, wherein the calcium-containing solution has a pH of 7.2 or 7.4 or 7.5.

23. The method according to any one of claims 1 to 22,
wherein subsequent to the last exposure step and for the purposes of preservation and flavor intensification, a mild salting is carried out with2.0% to 3.8% sodium chloride with respect to the quantity of caviar or caviar-like product, wherein the sodium chloride is free of potassium and calcium donors.

24. The method according to claim 23,
wherein the mild salting is carried out with 3.5% sodium chloride with respect to the quantity of caviar or caviar-like product, wherein the sodium chloride is free from potassium and calcium donors.

25. The method according to claim 23 or 24,

wherein subsequent to the preservation and flavor intensification, the caviar or the caviar-like product is frozen at a temperature in the range between -20ºC and -15ºC.

26. The method according to claim 25,
wherein the caviar or the caviar-like product is frozen at -18ºC.

27. The method according to claim 23 or 24,
wherein subsequent to the preservation and flavor intensification, storage of the caviar or caviar-like product is carried out in hermetically sealed glass containers one to three months, at a temperature between -2°C and -4°C.

28. The method according to any one of claims 1-27,
wherein the live, mature, ovulated eggs from fish or crustaceans with a polarization index “PI” of 0.05 ≤PI ≤ 0.05, are treated.

29. The method according to claim 28,
wherein the polarization index “PI” is 0.05 ≤ PI ≤ 0.12.

30. The method according to any one of claims 1 to 29,
wherein the live, mature, ovulated eggs from fish or crustaceans from the wild or from aquaculture farming, which are harvested in an ovulated state by spawning or stripping, are treated.

31. The method according to claim 30,
wherein the live, mature ovulated eggs are harvested from recent and primitive bony fishes or from crustaceans.

32. The method according to claim 31, wherein the live, mature, ovulated eggs are harvested from sturgeons species.

33. The method according to claim 31, wherein the live, mature, ovulated eggs are harvested from lobsters.

34. The method according to any one of claims1-33,

wherein very large live, mature, ovulated eggs with a grain size equal to or greater than 3.2 mm in diameter are treated.

35. The method according to any one of claims 1 to 34,
wherein soft, unstable, live, mature, ovulated eggs with a load before bursting of less than or equal to 0.3N are treated.

36. The method according to any one of claims 1 to 35,
wherein the saline solution is a 0.9 percent saline solution.

37. A caviar or caviar-like product from live, mature, ovulated eggs from fish or crustaceans which have three or more layers in egg envelope, said three or more layers comprising a zona radiate interna (ZRI), a zone radiata externa (ZRE), and an alveolar layer (AL), wherein the live, mature, ovulated eggs are in a fertile but unfertilized state and have a natural potassium content in the egg plasma,
wherein an elastic stabilizing layer (SS) is formed in the egg envelope between the zona radiata interna (ZRI) and the alveolar layer (AL), or between the zona radiata externa (ZRE) and the alveolar layer (AL), wherein the elastic SS is an eosinophilic and hyaline layer in which glucosaminoglycans are incorporated.

38. The caviar or caviar-like product according to claim 37,
wherein in addition, an irreversible cross-linking of protein strands by incorporated tyrosine molecules forms in the egg envelope in the Zona Radiata Interna (ZRI) and in the Zona Radiata Externa (ZRE).