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Agenda 5 **FFP/34 CRD/5**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON FISH AND FISHERY PRODUCTS

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REPORT OF THE PHYSICAL WORKING GROUPS ON THE CODE OF PRACTICE FOR FISH AND FISHERY PRODUCTS (SECTION ON CAVIAR)

Summary

The Physical Working Group (pWG), chaired by Iran, met on Sunday, 18 October to advance the development of the draft Code of Practice for Sturgeon Caviar using CRD3 as the basis for the discussion. The pWG took into account all the comments submitted by members by 18th October that are included in CX/FFP 15/34/6 Add.1, Add.2, Add.3 and relevant CRDs. The pWG was attended by 19 member countries[1] and the EU.

Good progress was made on reaching agreement on most of the text. These are outlined in this report, and the revised text is attached as Appendix I of this document for further consideration by CCFFP34.

The pWG began with an introduction and an overview of CRD3, as well as the recommendations of the eWG by Iran. Then a section by section discussion on the Code was started with the majority of the suggested revisions in CRD3 agreed. The main points of discussion focused on the following issues:

General considerations and X.16 – the proposal to modify the salt content of the end product was discussed but not agreed as it was inconsistent with the corresponding Section 2.2 of the *Stanard for Sturgeon Caviar* (CODEX STAN 291-2010);

Sections X.19 and X.23 – the references to "microbiological contamination" under potential hazards in these sections was retained as this term is defined in the *Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003);

Section X.20 – following wide debate on this issue, it was agreed that the provisions on labelling of: country of origin and pasteurisation would not be included in this section as they are not mentioned in the corresponding standard, and the *General Standard for Labelling of Pre-package Foods* (CODEX STAN 1-1985) could be referred to as appropriate in any case which is listed in the first bullet of X.20. The same principle was applied to the suggestion of labelling of hormones and anaesthesia used in the fish which was not included as the General Standard for Labelling could be referred to as needed;

Section X.21 – a country introduced CRD 14 to add new bullet for quick frozen products and, after extensive discussion, its proposal was modified and included in the second bullet. The modification was in line with the standard (i.e. last sentence of second paragraph of section 2.3.1) which states that freezing as well as frozen storage of caviar is not permitted unless the deterioration of quality is avoided. Several countries were of the opinion that, in principle, caviar should not be quick frozen (QF) and it should only exist in exceptional cases where the deterioration of quality can be avoided. Most of these countries were not aware of the use of new QF processing of caviar and its impacts on the traditional caviar product, and also considered that introducing this technique would necessitate new processing steps in the flow diagram. Also, it was noted that a general Code on QF products already exists which would cover such products so making a specific reference to QF caviar in this document was unnecessary. Other countries considered that the standard does not exclude frozen caviar from its scope and were of the opinion that QF caviar could be included in the code to take account of future technological development and innovation in this area.

The Chair thanks the delegates for their participation and for the good spirit of co-operation at the pWG.

Recommendation

Committee is invited to consider this report and the amended draft proposed code found in Appendix I.

[1] Argentina, Canada, China, Estonia, France, Germany, India, Iran, Italy, Japan, Luxembourg, Malaysia, Mexico, Norway, Papua New Guinea, Poland, Spain, UK, USA

Appendix I

General considerations:

In the context of recognizing controls at individual processing steps, this section provides examples of potential hazards and defects and describes technological guidelines that can be used to develop control measures and corrective actions. At a particular step, only the hazards and defects that are likely to be introduced or controlled at that step are listed. It should be recognized that in preparing a Hazard Analysis and Critical Control Point (HACCP) and/or Defect Action Point (DAP) plan it is essential to consult Section 5 ~~of the *Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003)~~, which provides guidance for the application of the principles of HACCP and DAP analysis. However, within the scope of this Code, it is not possible to give details of critical limits, monitoring, record-keeping and verification for each of the steps as these are specific to particular hazards and defects, and to the process used.

This section applies to products covered by the *Standard for Sturgeon Caviar* (CODEX STAN 291-2010), and covers the production of caviar, by extraction of non-ovulated eggs and the production of caviar from ovulated eggs by induction of ovulation using natural means as well as by the use of authorized products. Potential hazards and defects that may be introduced at a processing step are identified in this code of practice, a summary of major defects and additional prerequisites programs are listed below:

Microbial hazards: Ovaries remain sterile as long as they are located in the belly cavity. Contamination may occur through contact with hands, equipment and utensils, air, water, additives, fish skin and guts. Therefore, implementation of good hygienic practices (Section 3~~ of the *Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003)~~), use of potable or clean water and regular monitoring are very important. Time/ temperature control (shortest possible processing time under cold chain condition) followed by rapid transfer to cold area will reduce risk of microbial growth and related toxin production.

Proteolytic and non-proteolytic *Clostridium botulinum* are spore forming microbial hazards which should be controlled in packed caviar. These pathogens are controlled by an adequate quantity of salt (product salt content ≥ 3g/100g~~; and ≤ 5g/100g,~~ ≥ 5% salt in the water phase~~;, or~~ a water activity of < 0.97) and ~~proper~~ cold storage, (temperatures of ≤ 4°C). Other controlling factors shown to prevent *Clostridium botulinum* growth and toxin production in the caviar can be used when shown to be effective by scientific studies. In addition to the control of *C. botulinum*, countries producing caviar should ensure that the process used (e.g., pasteurization step, use of permitted food additives, % salt, microbiological testing, temperature controls) will control non-spore forming microorganisms (e.g., *Salmonella*~~ spp.~~, *Listeria monocytogenes*).

Chemical hazards: Contaminants such as heavy metals, pesticides, oil derivatives, residues of veterinary drugs, including hormones, need to be considered. Technical guidelines mentioned in Ss~~of the *Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003)~~ should be considered. Potential chemical hazards can also come from the water used for washing fish eggs and from other processing steps. Therefore, potable or clean water shall be used for this purpose. Contaminants from the salt and additives may also introduce chemical hazards.

Physical hazards: Sharp and hard fish body fragments, glass and metal inclusion (from utensils and packaging materials) can be introduced. The introduction of these hazards should be controlled. The control measures should be monitored and verified.

Defects: potential defects could be classified in 3 categories:

1- Development of ~~microbial and~~ chemical decomposition due to temperature abuse during caviar production process, handling and storage. This can be prevented by controlling time and temperature.

2- Fat tissues, ovarian follicles and blood clots in caviar (from slaughtered sturgeon), could be avoided by proper bleeding, careful sieving and ovarian washing.

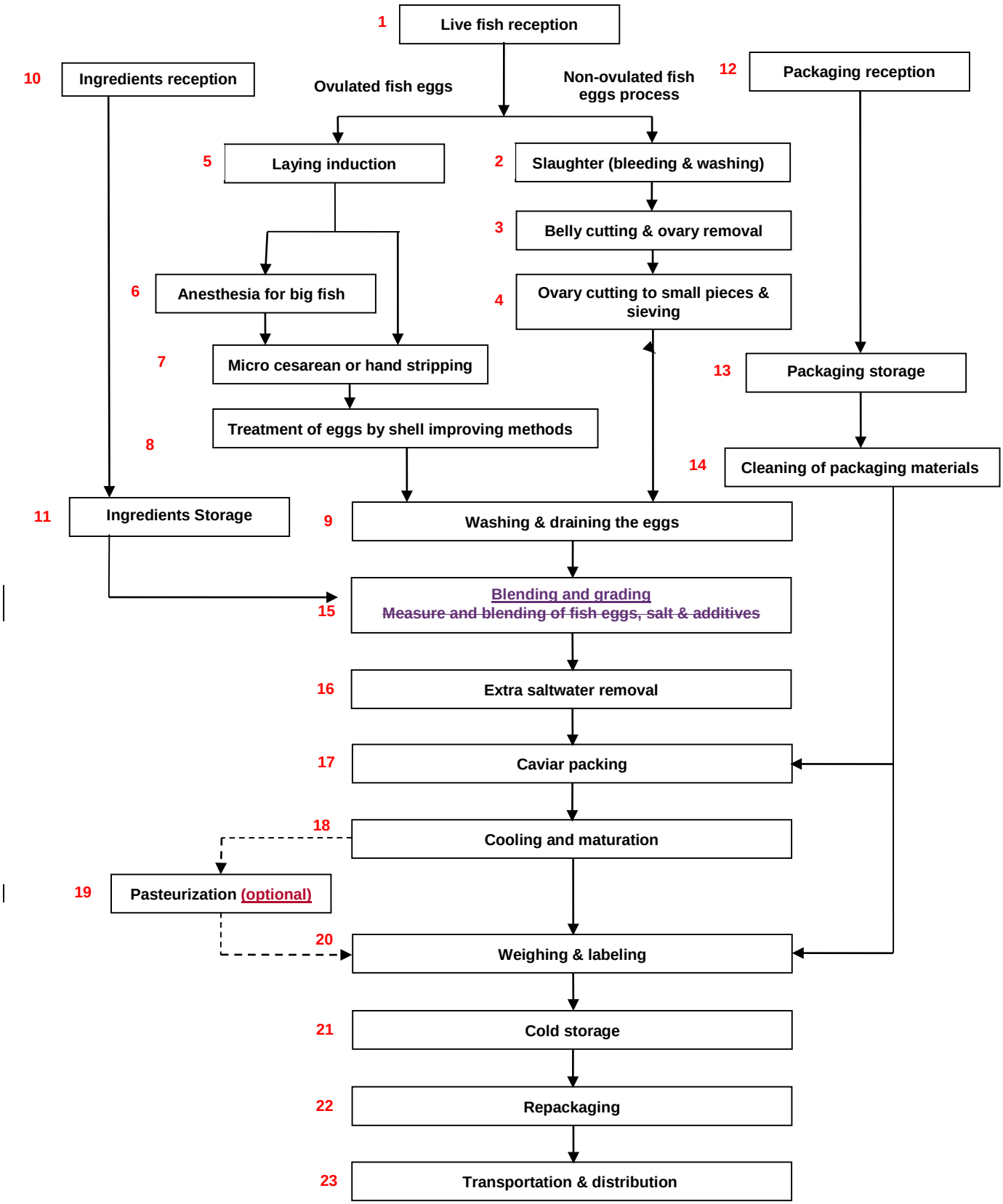
3- A number of factors can have an effect on physico-chemical and sensory properties of caviar; for example; eggs breakage, shell loosening, eggs softening or hardening as a result of overpressure on caviar and temperature abuse. Impure salt or additives, dust, smoke and aromatics in detergents or disinfecting agents can be absorbed by caviar and affect flavour and taste.

This code provides guidance for the common steps used for processing caviar as shown in the Example Flow Chart for Caviar Production (Figure x.1).

Figure x.1Example flow chart for caviar production

This flow chart is for illustrative purposes only. For in-factory HACCP implementation a complete and comprehensive flow chart has to be drawn up for each process.

References correspond to relevant Sections of the Code



X.1 Live fish reception (Processing Step1)

Potential Hazards: ~~Microbiological and c~~Chemical contamination (e.g. oil pollutants, heavy metals, pesticides, drugs residue)~~, Biotoxins (refer to Section 6.3.6 the *Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~

Potential defects: Decomposition, physical damage

Technical guidance:

- Refer to ~~the *Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003) s~~Sections 6.1, 6.2 and 6.3.
- Farmed fish should be harvested from growing area where water quality should comply with ~~S~~section 6.1.2 ~~(*Code of Practice for Fish and Fishery Product* (CAC/RCP 52-2003))~~.
- Fish handling should be undertaken in a manner to avoid stress (e.g. direct sunlight, high temperature, oxygen depletion) and contamination.
- In order to prevent the mortality of live fish which could result in decomposition in fish eggs, fish should be handled with care, stored in clean (filtered), oxygenated water and rapidly prepared for ovary removal.
- Live fish should be transported to a processing establishment quickly without causing physical damage.
- Training should be provided to persons who harvest, handle or receive fish.
- All documents related to health status of farmed fish such as veterinary drug or medicated feed dosage and period of treatment as well as feed composition should be reviewed at the reception points. For example, it should be ensured that the fish has been subjected to the proper withdrawal time for the specific products in question e.g., antibiotics or hormones.
- To facilitate traceability/product tracing of the fish, a record keeping system should be in place including a name and address of the farm sites (in case of farmed fish). If fish is kept out of water, the period of time should be short and the places used for this purpose should be clean.
- In the case of fresh dead fish, the fish should be stored under refrigeration or in cold ~~and~~ clean water.

X.2 Slaughter (bleeding and washing) (Processing step2)

Potential hazards: Microbiological contamination

Potential defects: Blood remaining in fish organs

Technical guidance:

- Stunning may be used to reduce stress after fish are harvested. It should be done by a skilled person and in accordance with the technical guidelines established by the OIE in order not to harm or damage the fish or eggs.
- As soon as the live fish have been slaughtered the fish should be bled to prevent blood dispersion into the eggs.
- Fish should be bled by cutting gills in both sides or by cutting the tail.
- Bleeding process should be fully completed before ovary removal.
- After bleeding is completed, fish should be washed with potable or clean water to clean all residual blood leftover from surface and reduce the risk of contaminating the eggs.
- Suitable facilities for hygienic waste disposal should be available in bleeding site.

X.3 Belly cutting and ovary removal (Processing step3)

Potential hazards: Microbiological and physical contamination

Potential defects: Physical damage to the eggs, off flavour, off odour, decomposition

Technical guidance:

- Prior to cutting, the belly part (around cutting area) should be fully brushed with potable or clean water to remove all foreign matter (e.g. sand and blood) and to reduce microbial load on the skin.

- All equipment/utensils used for cutting the belly, such as tables, knives, bowls used for ovary transfer and storage should be cleaned and disinfected.
- Cleaning and disinfection agents used for hand washing and on equipments should not affect the flavour and odour of the eggs.
- Belly cutting should be done by trained and skilled personnel using an appropriate method to preclude any contamination with viscera and damage to the eggs.
- All utensils that come in contact with fish eggs should not be used for other purposes and should be carefully cleaned, disinfected and stored in a proper place to avoid any contamination.
- Knives that are used for belly cutting should be distinct from those used for ovary cutting.
- If appropriate, the personnel performing the abdominal incision should be different from that in charge of cutting the ovaries.

X.4 Ovary cutting to small pieces and sieving (Processing step4)

Potential hazards: Microbiological contamination

Potential defects: Physical damage to the eggs, off flavour and off odour, eggs with bad consistency

Technical guidance:

- Prior to cutting to small pieces, ovaries could be placed in cold potable or clean water or cold potable or clean water with added salt to improve consistency.
- To prevent microbial contamination:
  - all caviar processing steps should be performed within areas set apart from belly cutting and gutting areas in order to prevent possible microbial cross-contamination.
  - all utensils and work surfaces should be cleaned and disinfected. Cleaning and disinfection agents used should not affect the flavour and odour of the eggs.
  - staff should be trained and have appropriate experience in cutting and sieving.
  - sieve should be washable and made from suitable material. Mesh size should be matched with egg size.
- Ovaries should be cut into small pieces to improve sieving process and reduce friction among eggs.
- Sieving should be performed in a manner that minimizes damage to the eggs to the extent possible while removing ovary follicle**s** and other undesirable matters (fat and blood).
- The ambient temperature and duration of exposure to the ambient temperature should be controlled and monitored to ~~minimize~~prevent microbial growth.

X.5 Laying induction (Processing step5)

Potential hazards: Chemical contamination (residues of veterinary drugs), use of unapproved drugs

Potential defects: Quality deterioration

Technical guidance:

- If hormones are used to induce ovulation (or to assist in the release of eggs), the hormones should have undergone regulatory assessment and be approved for use, for the purpose of food production, by the competent authorities having jurisdiction.
- Hormon dosage and treatment time should be applied in accordance with fish size and manufacturer's instructions.
- Eggs should only be harvested after the appropriate withdrawal period, following the injection of the hormone has been completed.

X.6 Anaesthesia for big fish (Processing step6)

Potential hazards: Chemical contamination (residues of veterinary drugs), use of unapproved drugs

Potential defects: Physical damage to the eggs, off flavour and off odour, quality deterioration

Technical guidance:

- If using electric shock, it should be done by skilled personnel with allowed voltage to minimize stress to fish and physical damage to eggs.
- If anaesthetics are used, their use must be approved for sturgeon intended for human consumption by the competent authorities having jurisdiction.
- Anaesthetic dosage and treatment time should be applied in accordance with fish size and the manufacturer's instructions.
- Refer to Ssection 6.3.2 ~~(*Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~.

X.7 Micro caesarean or hand stripping (Processing step7)

Potential hazards: Microbiological contamination

Potential defects: Physical damage to the eggs, foreign matter, off flavour and off odour

Technical guidance:

- Prior to cutting, belly area should be appropriately brushed and washed with potable or clean water to remove all foreign matters (sands and blood) and reduce microbial load.
- Cleaning and disinfection agents used for hand washing and on equipment should not affect the flavour and odour of eggs.
- Belly-cutting and the extraction of the eggs should be done by skilled personnel to minimize contamination with fish guts and faecal matter and reduce physical damage to the eggs.
- Hand stripping should be performed gently taking into account the anatomical position and direction of the oviduct in order to release the eggs quickly.

X.8: Treatment of eggs by shell improving methods (Processing step8)

Potential hazards: Chemical contamination (e.g. use of texturizing agents), microbiological contamination, drug residue

Potential defects: Damage to the egg texture, off flavour and off odour, quality deterioration

Technical guidance:

- Shell texturizing agents are not permitted in accordance with Section 4 (Food Additives) of the *Standard for Sturgeon Caviar* (CODEX STAN 291-2010)
- Treatment of eggs by shell improving methods should occur in a manner that does not result in chemical or microbiological contamination and growth.

X.9: Washing and draining the eggs (Processing step9)

Potential hazards: Microbiological and chemical contamination

Potential defects: Quality deterioration (damage to texture, off flavours and off odours), residues of undesirable matter (fat, blood and ovary remnant).

Technical guidance:

- The water used for washing the eggs should be potable or clean, free of any off odour and taste and it should be cold enough to prevent a loss in the texture quality. Salt may be added to the water in order to prevent water uptake by the eggs.
- The eggs should be washed until they are free from all foreign matter.
- The eggs should be drained using a sieve to avoid water remaining in fish eggs which may impact the final weight at packaging.
- Draining should be performed in a chilled cold room or in a temperature-controlled environment away from any source of contamination.

X.10 Ingredients reception (Processing step10)

Potential hazards: Microbiological, chemical and physical contamination (impurities), non permitted additives

Potential defects: Quality deterioration, foreign matter

Technical guidance:

- Refer to Section 8.5.1 ~~(*Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~. Additives should be used in compliance with requirements mentioned in Section 4 of the *Standard for Sturgeon Caviar* (CODEX STAN 291-2010).
- The ingredients should be inspected to ensure that they are clean and show no visible sign of contamination with dirt, oil~~, bilge~~ or other extraneous materials.
- Ingredients should be sourced from reliable suppliers, received with appropriate documentation about their composition and verified against the specifications requested.
- Salt used for caviar should be in compliance with the *Standard for Food Grade Salt* (CODEX STAN 150-1985).
- Salt impurities such as magnesium (Mg^{2+}) and calcium (Ca^{2+}) can affect the taste of the caviar and the penetration of sodium chloride into the eggs.
- ~~–~~Granule size of salt crystals and permitted additives should be tiny to allow for rapid dissolution and absorption into the eggs and to prevent damage to the eggs.

X.11 Ingredients storage (Processing step11)

Potential hazards: Microbiological, chemical and physical contamination

Potential defects: Loss of effectiveness, moisture absorption, dust and foreign matters.

Technical guidance:

- Refer to section 8.5.2 ~~(*Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~.
- Salt and additives should be packed and protected from chemical pollutants and foreign matters such as dust that may affect safety, odour and other sensory characteristics.
- Suitable procedures and controls should be in place to prevent exposure of ingredients to insects and pests.
- Storage area and packaging materials used for additives and salt should comply with S~~s~~ection 3 ~~(*Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~.
- All stored additives and salt should be kept with labels with the name, expiry date and storage requirements.

X.12 ~~Reception of p~~Packaging reception ~~materials~~ (Processing step12)

Potential hazards: Microbiological, chemical and physical contamination

Potential defects: Improper quality of packaging materials (material, paint coating, construction, sealing, corrosion). Inaccurate or misleading label information, contaminated packaging materials, foreign matter inclusion.

Technical guidance:

- Refer to S~~s~~ection 8.5.1 ~~(*Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~.
- All packaging materials such as metal or plastic cans, glass jars and rubber bands should be resistant to the components of caviar especially salt and additives and be able to preserve the product during its shelf-life without any quality loss.
- All packaging materials should be verified prior to use by trained personnel to ensure that specifications are met and that they are not damaged or contaminated.
- Any non-compliant items should be rejected and all corrective measures should be recorded.
- Prior to their application, labels should be verified to ensure that all information declared meets, where applicable the *General Standard for the Labelling of Pre-Packaged Foods* (CODEX STAN 1 - 1985) and labelling provisions of the *Standard for Sturgeon Caviar* (CODEX STAN 291-2010).
- Packaging materials and labels should be sourced from reliable suppliers and accompanied by appropriate documentation on the specifications and composition.

X.13 ~~Storage of p~~Packaging storage ~~materials~~ (Processing step13)

Potential hazards: Microbiological, chemical and physical contamination

Potential defects: Quality deterioration, physical damage, foreign matter inclusion

Technical guidance:

- Refer to Ssection 8.5.2 ~~(*Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~.
- Packaging materials and labels should be stored in dry and clean area to avoid any chemical and microbial contamination.
- Storage area should be clean and free of insects and pests.
- Trained personnel should periodically monitor storage environment and records should be kept.

X. 14 Cleaning of packaging materials (Processing step14)

Potential hazards: Microbiological, chemical and physical contamination

Potential defects: Damage of containers

Technical guidance:

- The cleanliness, integrity and safety of packaging materials should be monitored prior to use, to prevent cross-contamination of the caviar.
- Cleaning and disinfection should be performed outside of the processing area. Controls should be done at the reception step and related records should be checked.
- Cleaning and disinfection of packaging materials should be done by trained personnel with potable or clean water and permitted detergents and disinfectants.
- The effectiveness of the cleaning and disinfection of packaging materials should be validated, and revalidated after any changes of the procedures, e.g. change of disinfectants, cleaners etc.

X. 15 ~~Measuring and blending of fish eggs, salt and additives~~ Blending and Grading (Processing step15)

Potential hazards: Microbiological and physical contamination (e.g. glass and metal inclusion)

Potential defects: F~~Spoilage, microbial growth, f~~oreign matters, additive misuse

Technical guidance:

- The quantity or weight of eggs, salt and as applicable, additives should be measured adequately with calibrated equipments to ensure that the appropriate percentage of salt and additives are met.
- Additives should be used in compliance with the *Standard for Sturgeon Caviar* (CODEX STAN 291-2010).
- Additives should be used under conditions of good manufacturing practices in compliance with Section 3 (General Principles for the Use of Food Additives) of the *General Standard for Food Additives* (CODEX STAN 192-1995).
- The ingredients should be verified prior to use to ensure they are free from hazardous glass or other foreign matters.
- To prevent the growth and toxin production by non-proteolytic *Clostridium botulinum*, the quantity of salt added should result in at least 5% water phase salt or a water activity of ~~<~~<< 0.97.
- The ingredients and additives should be blended uniformly with the eggs.
- The ambient temperature, humidity, and the duration of exposure to the ambient temperature, should be controlled and monitored so that it does not affect the homogeneous distribution of ingredients and additives and to prevent microbial growth.
- Grading and blending should be done by trained personnel.

X. 16 Extra saltwater removal (Processing step16)

Potential hazards: Microbiological contamination

Potential defects: Quality deterioration due to improper saltwater removal

Technical guidance:

- Extra saltwater removal (sieving) should be done in a manner that does not damage the quality of caviar.

- Extra saltwater removal should be performed by trained personnel.
- The salt content of final product should be equal to or above 3g/100g and below or equal to 5g/100g ~~remain~~ (≥ 5% in the water phase or a water activity of ~~≦~~ ≤0.97).

~~In addition, the salt content shall be equal to or above 3g/100g and below or equal to 5g/100g~~

- The ambient temperature and duration of exposure to the ambient temperature should be controlled and monitored to ~~minimize~~prevent microbial growth.

X. 17 Caviar packing (Processing step17)

Potential hazards: Microbiological contamination~~,~~

Potential defects: Oxidation, physical damage, off flavour, egg discoloration due to corrosion of container's epoxy coatings, improper coding, rusting

Technical guidance:

- All packaging materials should be verified prior to use to ensure that they are not contaminated and are free from physical damage. These materials should be dry.
- The cans/jars should be filled to capacity to minimize the air space but should not put pressure on the caviar.
- Vacuum~~Air exhausting~~ and sealing of cans or jars should be performed by trained personnel to ensure that air is fully removed from cans/jars to inhibit the growth of aerobic micro-organisms as well as fat oxidation.
- During the vacuum sealing~~exhausting~~ process, the cans/jars should be kept clean from salt water that leaves the cans/jars.
- The ambient temperature and duration of exposure to the ambient temperature should be controlled and monitored to minimize microbial growth by maintaining caviar temperature ≤ 4ºC.
- The primary coding should be verified by trained personnel to ensure that it is legible, accurate and permanent.

X.18 Cooling and maturation (Processing step18)

Potential hazards: Microbiological contamination

Potential defects: Decomposition, quality deterioration

Technical guidance:

- Packaged caviar should be stored in an appropriate manner prior to final cold storage (for example in a refrigerator; 2-4 °C for 24 hours) upon packaging to facilitate salt absorption, equilibrium and maturation (equal salt distribution in caviar, giving enough time for saltwater removal) and also to minimize microbial growth.
- Laboratory check should be performed for proper caviar salt content (e.g. by water phase salt determination or by water activity measurement and weight as appropriate) after maturation is complete.
- Cooling system should be cleaned and equipped with thermometer and thermograph to frequently monitor and record caviar temperature.
- Cooling system should be frequently calibrated to ensure accuracy and efficiency.

X.19 Pasteurization (optional step) (Processing step19)

Potential hazards: Microbiological contamination

Potential defects: Taste and flavour change, hardening of caviar grains

Technical guidance:

- Pasteurization process should be performed and monitored by trained personnel to ensure process specifications are followed and the equipment is functioning appropriately.
- The containers should be sealed hermetically prior to pasteurizing in order to prevent post-contamination.

- Caviar cans/jars should be cooled to lower temperature (0°C to 4°C) immediately after pasteurization to prevent germination, growth and toxin production of spore forming microorganisms and prolonged heating of proteins which might affect taste and texture.
- Pasteurization time and temperature should be determined in relation to cans/jars volume, shape and material, as well as weight of caviar in cans and type of pasteurization equipment used for process to ensure required temperature is applied on the caviar for a suitable period of time.
- All thermal equipment and monitoring devices should be regularly checked and calibrated based on a schedule to ensure accuracy.

X.20 Weighing and labelling (Processing step20)

Potential hazards: Unlikely~~Incorrect or misleading labelling~~

Potential defects: ~~Unlikely~~ incorrect labelling and weighing

Technical guidance:

- Information printed on the labels should be in compliance with the *General Standard for the Labelling of Pre-Packaged Foods* (CODEX STAN 1-1985) and the *Standard for Sturgeon Caviar* (CODEX STAN 291-2010). ~~The country of origin (where the sturgeon is born, reared, slaughtered and where the caviar is produced) should be labelled.~~
- ~~[Pasteurization treatment or a reference to pasteurization should be indicated on the label.]~~
- The cans/jars should be weighed to ensure the quantity of caviar filled meets weight declared on the label.
- Net weight,refrigeration instructions and a maximum shelf-life for caviar should be clearly labelled.
- Caviar cans/jars should not be described or presented on any label in a manner that is false or misleading to consumers.
- Labels should be monitored for accuracy by trained personnel.

X.21 Cold storage (Processing step21)

Potential hazards: Microbiological contamination

Potential defects: Freezing, decomposition and quality deterioration

Technical guidance:

- The product should be held at cold storage temperatures between -4ºC and 0ºC.
- Care should be taken to avoid temperatures below -5°C which will cause freezing and quality deterioration. ~~.~~Normally freezing or frozen storage is not permitted, unless it can be demonstrated that quality deterioration is avoided.
- Caviar cold storage room should be cleaned and disinfected based on a permanent cleaning and disinfection schedule.
- The chilled storage facility should have a temperature monitoring device and preferably a continuous recording unit to monitor and record ambient temperatures properly.
- Temperature monitoring system should be supplied with an alarm to alert any fluctuations from allowed limits.
- All time/temperature monitoring and record systems should be calibrated regularly through a permanent schedule to ensure accurate and precise performance.
- Containers of caviar should be periodically checked regarding for loss of vacuum or rusting for cans ~~air existence~~ and any affected containers should be ~~re-exhausted or~~ rejected.

X.22 Repackaging (Processing step22)

See S~~s~~ection X.17 and X.20

X.23 Transportation and distribution (Processing step23)

Potential hazards: Microbiological contamination

Potential defects: Decomposition, physical damage to the caviar cans/jars

Technical guidance:

- Refer to Ssection 17, ~~(*Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003))~~.
- Proper handling and vehicle conditions should be followed to prevent physical damage to caviar cans/jars.
- Caviar temperature should be monitored during loading to make sure the temperature is between -4°C to 0°C.
- Temperature of vehicle storage cabin should be maintained between - 4°C to 0°C.
- The duration of caviar exposure to surrounding temperatures above 2°C should be monitored to prevent temperature abuse and pathogen growth.
- Products should be transported in a way that allows cool air to circulate easily around cans/jars and that protects them from physical damages.
- Product cabin should be completely insulated and clean. It should be cleaned and disinfected according to a regular sanitation schedule.
- The storage cabin should be equipped with a thermometer and a thermograph to frequently monitor and record the storage temperature.
- Handling should be done by trained personnel.