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Processing and handling of prawns or shrimps — Code of practice

EAST AFRICAN COMMUNITY

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East African Community
P.O.Box 1096
Arusha
Tanzania
Tel: 255 27 2504253/8
Fax: 255 27 2504481/2504255
E-mail: eac@eachq.org
Web: www.eac-quality.net

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

In order to achieve this objective, the Community established an East African Standards Committee mandated to develop and issue East African Standards.

The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

FDEAS 874 was prepared by Technical Committee EASC/TC 003, *Fish and fishery products*.

Processing and handling of prawns or shrimps — Code of practice

1 Scope

This Final Draft East African standard prescribes guidelines for processing and handling of prawns or shrimps intended for human consumption.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CAC/GL 31, *Guidelines for the sensory evaluation of fish and shellfish in laboratories*

CODEX STAN 192, *General standard for food additives*

EAS 12, *Drinking (potable) water* — *Specification*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions shall apply.

3.1

prawn/shrimp

small swimming aquatic crustacean with an elongated body

3.2

deveining

process of removing the vein and/or gut from a peeled prawn or shrimp

4 Handling of prawns or shrimps

4.1 Raw fresh and frozen prawns or shrimps on receipt

4.1.1 Prawns or shrimps should be inspected upon receipt to ensure that they are well iced/preserved or deep frozen and accompanying records are in place for the purpose of product traceability. Upon receipt necessary records should be taken and kept properly.

4.1.2 A sensory evaluation should be performed in accordance with CAC/GL 31 on incoming lots to ensure that the product is of acceptable quality and not decomposed.

4.1.3 Checking should include substances such as phytotoxins in wild caught prawns or shrimps (specifically for head-on products) and potential veterinary drugs residues for prawns or shrimps produced under aquaculture. In addition, other chemical indicators for heavy metals, pesticides and indicators of decomposition may be applied.

4.1.4 It is necessary to wash fresh prawns or shrimps on receipt in suitable equipment with a series of low-velocity sprays with chilled potable water complying with EAS 12.

4.1.5 Prawns or shrimps should be stored in suitable facilities and allocated "use by" /duration for processing to ensure quality parameters are met in the end -products.

4.2 Frozen storage

4.2.1 The packaging container should be undamaged to avoid possibilities of contamination and dehydration. In the case of damaged packaging, repacking should be done.

4.2.2 Cold storage facilities should be suitable for storage with minimal temperature fluctuation.

4.2.3 The cold storage facility should have a temperature monitoring device, preferably a continuous recording unit to monitor and record ambient temperature properly.

5 Processing

5.1 General

The product should be processed within the "best before" time on the packaging, or before as dictated on receipt.

5.2 Thawing

5.2.1 The thawing process is undertaken on frozen shrimps depending on raw material sources. The outer and inner packaging should be removed prior to defrosting in order to prevent contamination. Extra care should be taken on block frozen prawns or shrimps where inner wax or polyethylene packaging may be entrapped with blocks.

5.2.2 Thawing tanks should be purposely designed to allow for "counter current" water defrosting where necessary to maintain lowest possible temperatures. However, water reuse is discouraged.

5.2.3 Potable water at a temperature not higher than 20 °C should be used for thawing. Use of additional ice to achieve a defrosted product at a temperature lower than 4 °C is recommended.

5.2.4 Thawing should be achieved as quickly as possible to maintain quality of the product.

5.2.5 It is desirable that the exit conveyor, leading from the defrost tanks, be equipped with a series of low-velocity sprays to wash the prawns or shrimps with chilled potable water.

5.2.6 Immediately after thawing, the prawns or shrimps should be maintained at chilled temperature or re-iced to avoid undue temperature rise before further processing.

5.3 Chilled storage

5.3.1 Chilled storage after receipt should be maintained at temperature between 0 °C and 4 °C

5.3.2 The chilled storage facility should have a temperature monitoring device (preferably a continuous recording unit) to monitor and record ambient temperatures properly.

5.3.3 Unnecessary delays should be avoided during chilled storage in order to prevent quality deterioration.

5.4 Selection

Prawns or shrimps may be selected for different quality parameters (grades, and species) according to specification requirements. This should be undertaken without delay followed by re-icing of the prawns and shrimps.

5.5 Size grading

5.5.1 Size grading of prawns or shrimps is undertaken manually or by use of mechanical graders of various degrees of sophistication. There is a possibility of prawns or shrimps becoming trapped in the bars of the graders. Hence, regular inspection is required to prevent "carry over" of old prawns and bacteriological contamination.

5.5.2 Prawns or shrimps should be re-iced and stored in chilled condition prior to further processing.

5.5.3 The grading process should be carried out quickly to prevent microbiological growth and product decomposition.

5.6 Addition of ingredients and use of additives

5.6.1 According to specification and legislation, certain treatments may be applied to prawns or shrimps to improve organoleptic quality, preserve yield or preserve them for further processing.

5.6.2 Examples of treatments include sodium metabisulphite to reduce shell blackening, sodium benzoate to extend shelf-life between processes and sodium polyphosphates to maintain succulence.

5.6.3 These ingredients and additives can be added at various stages, for example, common salt and sodium polyphosphates at defrost stages or chilled brine as a flume conveyor between cooking and freezing, or as glaze as stipulated under CODEX STAN 192.

5.6.4 At whatever stage where ingredients and additives are added, it is essential to monitor the process and product to ensure that any limits set by standards are not exceeded, quality parameters are met and that where dip baths are used, the contents are changed on a regular basis according to drawn-up plans.

5.6.5 Chill conditions should be maintained at all stages of production.

5.6.6 Sulphites for prevention of blackspot formation (autolysis) should be used in accordance with the manufacturer instructions and Good Manufacturing Practices (GMP).

5.7 Full and partial peeling

5.7.1 This process is recommended mainly to warm water prawns or shrimps and could be as simple as inspecting and preparing whole large prawns or shrimps for freezing and downgrading blemished prawns or shrimps for full peeling.

5.7.2 Other peeling stages should include full peeling or partial peeling leaving tail swimmers intact depending on the quality of the product.

5.7.3 Whatever the process, it is necessary to ensure that the peeling tables are kept clear of contaminated shrimps and shell fragments with water jets and the shrimps are rinsed to ensure no carryover of shell fragments.

5.8 Deveining

5.8.1 The vein is the dark line which appears in the upper dorsal region of prawns or shrimps flesh. In large warm water prawns or shrimps, this may be unsightly, gritty and a source of bacterial contamination.

5.8.2 Deveining is the removal of the vein by cutting longitudinally along the dorsal region of the prawns or shrimps and pulling the vein. This may be partially achieved with head-off, shell-on prawns or shrimps as well.

5.8.3 This operation is considered to be mechanical though labour intensive. Therefore, cleaning and maintenance schedules should be in place and cover the need for cleaning before, after and during processing by trained operators. In addition, it is essential to ensure that damaged and contaminated prawns or shrimps are removed from the line and that no debris build up is allowed.

5.9 Washing

5.9.1 Washing of peeled and deveined prawns or shrimps is essential in order to ensure that shell and vein fragments are removed.

5.9.2 Prawns or shrimps should be chilled immediately after draining the water.

5.10 Cooking processes and conditions

5.10.1 The cooking procedure and conditions, in particular time and temperature, should be fully defined according to the specification requirements of the final product, for example, whether it is to be consumed without further processing, and the nature and origin of the raw prawns or shrimps and uniformity of size grading.

5.10.2 The cooking schedule should be reviewed before each batch, and where continuous cookers are in use, constant logging of process parameters should be available.

5.10.3 Only potable water should be used for cooking, whether in water or via steam injection.

5.10.4 The monitoring methods and frequency should be appropriate for the critical limits identified in the scheduled process.

5.10.5 Maintenance and cleaning schedules should be available for cookers and all operations should only be undertaken by fully trained staff.

5.10.6 Adequate separation of cooked prawns or shrimps exiting the cooking cycle is essential in order to ensure no cross-contamination. This will be achieved through the use of suitable equipment and containers.

5.11 Peeling of cooked shrimps or prawns

5.11.1 Cooked prawns or shrimps have to be properly peeled manually or through mechanical peeling in line with cooling and freezing processes.

5.11.2 Cleaning and maintenance schedules should be available and implemented by fully trained staff in order to ensure efficient and safe processing.

5.12 Cooling processes

5.12.1 Cooked prawns or shrimps should be cooled as quickly as possible to bring the temperature to a range limiting microorganism proliferation or toxin production.

5.12.2 Cooling schedules should enable the time-temperature requirements to be met.

5.12.3 Maintenance and cleaning schedules of cooling equipment should be in place and complied with.

5.12.4 Only potable water should be used for cooling and it should not be used for subsequent batches, although for continuous operations a top-up procedure and maximum run-length will be defined.

5.12.5 It is essential to separate cooled products.

5.12.6 After cooling and draining, the prawns or shrimps should be frozen as soon as possible, to avoid spoilage.

5.13 Freezing processes

5.13.1 The freezing process will vary considerably according to the type of product. At its simplest, raw whole or head-off Prawns or shrimps may be block or plate frozen in purpose-designed cartons into which potable water is poured to form a solid block with protective ice.

5.13.2 At the other extreme, cooked and peeled Pandalus cold water prawns or shrimps tend to be frozen through fluidized bed systems, while many warm water prawns or shrimps products are Individually Quick Frozen (IQF) either on trays in blast freezers or in continuous belt freezers.

5.13.3 Irrespective of the freezing process, it is necessary to ensure that the freezing conditions specified are met and that, for IQF products, there is no clumping, that is, pieces frozen together. Putting product into a blast freezer before it is at operating temperature may result in glazed, slow-frozen product and contamination.

5.13.4 Freezers should be cleaned and maintained as per schedule operated by fully trained staff.

5.14 Glazing

5.14.1 Glazing is applied to frozen prawns or shrimps to protect against dehydration and maintain quality during storage and distribution.

5.14.2 Freezing prawns or shrimps in blocks of ice is the simplest form of glazing, followed by dipping and draining frozen prawns or shrimps in chilled potable water.

5.14.3 A more sophisticated process is to pass frozen size-graded shrimps under cold water sprays on vibratory belts such that the prawns or shrimps pass at a steady rate to receive an even and calculable glaze cover.

5.14.4 Ideally, glazed prawns or shrimps should receive a secondary re-freezing prior to packing, but if not, they should be packaged as quickly as possible and moved to cold storage. If this is not achieved, the prawns or shrimps may freeze together and "spot weld" or clump as the glaze hardens.

5.15 Weighing, packaging and labelling

5.15.1 Wrappings and packaging, including glues and inks, should be of food grade, odourless, with no risk of substances likely to be harmful to health being transferred to the packaged prawns and shrimps.

5.15.2 Prawns or shrimps should be weighed in packaging with scales appropriately tarred and calibrated to ensure correct weight.

5.15.3 Where products are glazed, checks should be carried out to ensure the correct compositional standards to comply with legislation and packaging declarations.

5.15.4 All ingredients used including food additives should be declared on the label in descending order by weight. All wrapping and packaging should be carried out in a manner to ensure that the frozen products remain frozen and that temperature rises are minimal before transfer back to frozen storage.

5.15.5 Sulphites should be used in accordance with manufacturer's instructions and GMP.

5.16 Transportation

During transportation of prawns or shrimps the following should be considered:

- a) the temperature of the product before loading and during transportation should comply with specific product standard. For instance, frozen products core temperature should be maintained at $-18\text{ }^{\circ}\text{C}$ or below;
- b) exposure to elevated temperatures during loading and unloading of prawns or shrimps should be avoided;
- c) product arrangement during loading should ensure good air flow between product, wall, floor and roof panel; and
- d) transportation and distribution facility should provide adequate protection against contamination from dust, exposure to higher temperatures and the drying effects of the sun or wind.

6 Final product quality control metal detection

6.1 The processor should put in place appropriate measures to ensure that final product is free from metal contamination.

6.2 Larger packs will be detected at a lower sensitivity than smaller packs, so consideration should be given to testing product prior to packaging. However, unless potential re-contamination prior to packaging can be eliminated, it is probably still better to check in-pack.

7 Frozen storage of end-product

7.1 Frozen products should be stored at freezing temperature in a clean and hygienic environment.

7.2 The facility should be capable of maintaining the temperature of the shrimps at or below $-18\text{ }^{\circ}\text{C}$.

7.3 The storage area should be equipped with a calibrated, indicating thermometer. Fitting of a recording thermometer is strongly recommended.

7.4 A systematic stock rotation plan should be developed and maintained.

7.5 Products should be properly protected from dehydration, dirt and other forms of contamination.

7.6 All end-products should be stored in the freezer in a manner that will allow proper air circulation.

Bibliography

CAC/RCP 52, *Code of practice for fish and fishery products*

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