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Quick-frozen coated aquatic products — Specification

Produits aquatiques enrobés surgelés — Spécification

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Foreword

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This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 6, *Meat, poultry, fish, eggs and their products*.

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Introduction

As a kind of instant and healthy food, quick-frozen coated aquatic products are very popular among global consumers due to their different varieties, tender texture, delicious taste and convenience. The product not only maintains the nutrition and freshness of aquatic products, but also improves the flavour by using different seasonings and batter formulas.

The global annual output and international trade for frozen coated aquatic products have been on the rise with the continuous growth of consumers' preference for quick-frozen prepared and instant food. In addition, the diversity of aquatic animals results in varying quality and market prices. The existing International Standard for quick-frozen coated aquatic products is CXS 166, but this is only applicable to frozen breaded fish, which as a product type is rather narrow for such a huge market. The absence of an International Standard for other product types makes it difficult to ensure consumers' health and food safety.

This document, therefore, specifies the quality requirements for quick-frozen coated aquatic products.

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Quick-frozen coated aquatic products — Specification

1 Scope

This document specifies the requirements for quick-frozen coated aquatic products and test methods for quality control. It also specifies the requirements of packaging, labelling, storage and transportation.

This document is applicable to raw or pre-cooked products made from a single species of finfish, crustaceans, cephalopods or other aquatic animals, mainly through pre-treatment, wet and/or dry coating with batter and/or breading and quick freezing.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 1442, *Meat and meat products — Determination of moisture content — Reference method*

AOAC Official Method 977.13, *Histamine in Seafood: Fluorometric Method*

CXC 1, *General Principles of Food Hygiene*

CXC 8, *Code of Practice for the Processing and Handling of Quick Frozen Foods*

CXC 52, *Code of Practice for Fish and Fishery Products*

CXS 1-1985 (revised in 2018), *General Standard for the Labelling of Prepackaged Foods*

CXS 152 *Standard for Wheat Flour*

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CXS 192-1995 (revised in 2024), *General Standard for Food Additives*

CXS 210, *Standard for Named Vegetable Oils*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

fish fillet

slice of fish flesh of irregular size and shape removed from the carcass of finfish by cutting made parallel to the back bone, with or without skin

Note 1 to entry: The slices of fish flesh may be jointed or repaired to obtain fish fillets with regular shape or size.

3.2

fish block

fish portion

rectangular or other uniformly shaped masses of cohering *fish fillets* (3.1), minced fish or a mixture thereof

3.3

fish stick

fish finger

finger-like fish flesh cut from frozen *fish block* (3.2) or *fish fillet* (3.1), weighing not more than 30 g with the length not less than three times the greatest width, and not less than 10 mm thick

3.4

round shrimp or prawn

product prepared by removing the head, all shell segments and tail fins of a shrimp or a prawn

3.5

fantail shrimp or prawn

product prepared by peeling a shrimp or a prawn except that the tail fins remain attached, and the shell segment immediately adjacent to the tail fins can be left attached

3.6

butterfly shrimp or prawn

product prepared by peeling a shrimp or a prawn except that the tail fins and the shell segment immediately adjacent to the tail fins can be left attached, and there is splitting through the back to maintain the connection of abdominal flesh, and then flattening to a butterfly shape

3.7

squid ring

ring shape product (with or without skin) prepared by cross-cutting or flat-cutting (including punching) the carcass body of a squid

3.8

squid slice

flesh prepared by double-sided carving the peeled carcass of a squid and cutting it into a slice or a piece shape

3.9

batter

viscous and homogenous liquid preparations from ground cereals, water, with or without salt, sugar, other ingredients and food additives

Note 1 to entry: Typical batter types are leavened batter and non-leavened batter.

3.10

breadding

dry or wet breadcrumbs or other powdery or coarse granular dry preparations mainly from cereals with or without colourants and other ingredients

Note 1 to entry: Typical breadding types are free-flowing breadding, coarse breadding and flour-type breadding.

3.11

coating

process of uniformly covering the surface of aquatic animal flesh with *batter* (3.9) and/or *breadding* (3.10)

3.11.1

wet coating

process of covering a flesh core uniformly on all sides with *batter* (3.9) (without a bare flesh area)

3.11.2

dry coating

process of completely covering wet-coated flesh with *breadding* (3.10) that adheres well to *batter* (3.9)

3.12

pre-cooking

process of frying coated aquatic products in a preheated oil bath for a short time in order to achieve a satisfying colour and flavour, and to make the outer *coating* (3.11) adhere firmly to the flesh core

4 Product classification

4.1 The products are divided into the following categories according to the kind of aquatic animals:

- quick-frozen coated fish products, which are prepared by coating fish fillets, fish sticks, fish blocks and other similar products with batter and/or breading;
- quick-frozen coated crustacean products, which are prepared by coating round, fantail or butterfly shrimps or prawns, crab meat and other similar products with batter and/or breading;
- quick-frozen coated cephalopods products, which are prepared by coating the edible parts of cephalopods (the head, tentacles, squid ring, squid slice, etc.) and other similar flesh with batter and/or breading;
- quick-frozen coated products made from other edible aquatic animals.

4.2 The products are divided into the following categories according to whether they have been pre-cooked or not:

- quick-frozen raw coated aquatic products, which are prepared by coating aquatic animal flesh with batter and/or breading and quick freezing directly without pre-cooked processing;
- quick-frozen pre-cooked coated aquatic products, which are prepared by coating aquatic animal flesh with batter and/or breading, and quick freezing after pre-cooking in frying oil (fat).

5 Requirements

5.1 Raw and supplementary materials

5.1.1 Aquatic animals

5.1.1.1 Only fresh or frozen finfish, crustaceans, cephalopods and other edible aquatic animals that are fit for human consumption shall be used as raw materials.

5.1.1.2 The content of contaminants in aquatic animals shall conform to the requirements given in [Table 1](#). Residues of veterinary drugs in cultured aquatic animals shall conform to the requirements given in [Table 2](#).

Table 1 — Maximum levels of contaminants in aquatic animals

Contaminants	Aquatic animals	Maximum level (ML) (mg/kg)	Notes
Cadmium	Marine bivalve molluscs	2	The ML applies to clams, cockles and mussels after removing the shell.
	Cephalopods	2	The ML applies to cuttlefishes, octopuses and squids without viscera.
Lead	Fish	0,3	The ML applies to fish flesh after removing the digestive tract.
Methylmercury	Alfonsino	1,5	The ML applies to fish flesh after removing the digestive tract. If the total mercury concentration is below or equal to the ML for methylmercury, no further testing is required, and the sample is determined to be compliant with the ML. If the total mercury concentration is above the ML for methylmercury, follow-up testing shall be conducted to determine if the methylmercury concentration is above the ML.
	Marlin	1,7	
	Orange roughy	0,8	
	Pink cusk-eel	1	
	Shark	1,6	
	Tuna	1,2	

Table 2 — Maximum residue limits of veterinary drugs in cultured aquatic animals

Veterinary drugs	Species	Tissue	Maximum residue limits (MRL) (µg/kg)	Notes
Amoxicillin	Finfish	Fillet	50	The term “finfish” includes all fish species. Muscle plus skin in natural proportions.
Ampicillin	Finfish	Fillet	50	The term “finfish” includes all fish species. Muscle plus skin in natural proportions.
Oxytetracycline	Fish	Muscle	200	—
Deltamethrin	Salmon	Muscle	30	—
Diflubenzuron	Salmon	Fillet	10	Muscle plus skin in natural proportions.
Emamectin benzoate	Salmon and Trout	Fillet	100	Muscle plus skin in natural proportions.
Flumequine	Trout	Muscle	500	Muscle including the normal proportion of skin.
Lufenuron	Salmon and Trout	Fillet	1 350	Muscle plus skin in natural proportions.
Teflubenzuron	Salmon	Muscle	400	—

5.1.1.3 The aquatic animals shall be cultured in marine or freshwater, or harvested from fishing zone designated by Food and Agriculture Organisation (FAO) of the United Nations and captured with permitted fishing gear.

5.1.2 Coating materials

The batter, breading and all ingredients used for coating shall be of food grade quality, and wheat flour shall conform to CXS 152.

5.1.3 Frying oil

Vegetable oil used in pre-cooking operation shall conform to CXS 210.

5.2 Processing requirements

5.2.1 The key steps of quick-frozen coated aquatic products processing are pre-treatment, coating and quick freezing. Seasoning and pre-cooking are optional steps.

5.2.2 During the process (except for pre-cooking), the temperature of aquatic animal flesh should not exceed 10 °C. The proportion of coating and flesh core shall be appropriate to avoid insufficient or excessive coating. After quick freezing, the central temperature of final products shall be –18 °C or below.

5.3 Organoleptic requirements

Quick-frozen coated aquatic products shall conform to the requirements given in [Table 3](#).