



# NORWEGIAN INDUSTRY STANDARD FOR FISH

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## Standard

# *Quality grading of farmed salmon*

Industry Standards for Fish  
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## Introduction

The Norwegian Industry Standards for Fish and their accompanying Codes of Practice have been drawn up by the project «Industry Standards for Fish». Five specialist sub-committees, representing the respective industries of whitefish, salted fish/klippfish, stockfish, pelagic fish and salmon/trout, have been responsible for the specialist content, drawing on professional resources within production and processing, exports and research.

The standards include product specifications, quality classifications and method descriptions, whereas the codes of practice provide guidelines and describe matters of importance to the production processes.

## 1 Object

This industry standard lays down general and specific requirements pertaining to the quality grading of farmed salmon. Use of the standard is voluntary and shall contribute to an unambiguous description and understanding of Norwegian fish products. The standard shall also serve to simplify market communication, for example as a tool when drawing up contracts and orders.

The Directorate of Fisheries' Quality Control Service may issue certificates in accordance with the industry standards accepted by the Director General of Fisheries.

## 2 Scope

This standard describes quality grading of farmed salmon, *Salmo salar*, in the categories Superior, Ordinary and Production. Fish that do not satisfy the requirements in this standard shall not be described according to this standard, but shall be treated according to the Norwegian Quality Regulations relating to Fish and Fishery Products.

This industry standard, together with the industry standard for *quality grading of farmed rainbow trout (NBS 10-02)*, replaces the Industry Standard for Farmed Salmon of 6 September 1996.

## 3 Definitions

**Fully bled:** The gills are severed and the fish is fully bled.

**Environmental colour:** The fish has an uncharacteristic colour

(grey, brown or green tint) in the skin caused by environmental effects

**Melanin:** Dark pigment deposited in the skin or musculature.

**Lice:** *Lepeoptheirus salmonis*

**Pre-rigor:** Before rigor mortis sets in.

## 4 References

Norwegian Quality Regulations relating to Fish and Fishery Products of 14 June 1996 with subsequent amendments, most recently of 10 June 1998

NS 9401 Atlantic salmon

Reference sampling for quality assessment

NS 9402 Atlantic salmon

Measuring colour and fat

## 5 Description

### 5.1 Preconditions

#### 5.1.1 Government requirements

Farmed salmon, *Salmo salar*, produced in accordance with this standard satisfies the requirements in the Norwegian Quality Regulations relating to Fish and Fish Products. The regulations include requirements to:

- wholesome and fresh products
- hygiene
- chilling
- use of medicines
- sorting and rectifying defects
- labelling
- additives
- own checks, based on HACCP principles

#### 5.1.2 Starving

The fish is sufficiently starved so that the gut is empty and no remains of foodstuff can be detected.

#### 5.1.3 Colour

The colour is measured against Norsk Kvalitetssnitt (Norwegian Colour Average), cf. NS 9402, using the Roche colour card for salmonids or Roche *SalmoFan*<sup>TM</sup>.

When using the colour card for salmonids, the scale 11 – 18, determination of fillet colour, is used. The following colour requirements apply:

- a) Fish < 3 kg: average for consignment: ≥ 14, but minimum 13
- b) Fish ≥ 3 kg: average for consignment: ≥ 15, but minimum 14

When using Roche *SalmoFan*<sup>TM</sup> the following colour requirements apply:

- c) Fish < 3 kg: average for consignment: ≥ 24, but minimum 22
- d) Fish ≥ 3 kg: average for consignment: ≥ 27, but minimum 24

Salmon that do not satisfy the above criteria are not to be classified according to this standard.

#### 5.1.4 Processing

The fish is produced, starved, transported, and slaughtered so that

shelf life and structure do not deteriorate and the product retains its optimal quality from the farm to the consumer.

At the time of packing this is characterised by:

- a) the fish being in a state of pre-rigor at the time of packing
- b) core temperature  $\leq 4^{\circ}\text{C}$
- c) the fish being fully bled
- d) lice having been removed
- e) entrails having been removed
- f) the musculature being firm, elastic and resilient

Salmon that do not satisfy the above criteria are not to be classified according to this standard.

## 5.2 Quality grading

Farmed salmon are graded in the quality classes: Superior, Ordinary or Production.

### 5.2.1 Superior

A first class product with characteristics which make it suitable for all purposes. The product is without substantial faults, damage or defects and provides a positive overall impression.

The product has the following characteristics at the time of packing:

- a) skin with sheen and no significant loss of scales
- b) no healed sores impairing the overall impression
- c) no open sores
- d) no bruising or damage to belly or musculature
- e) no melanin spots in the musculature
- f) intact, firm belly membrane
- g) whole or worn (healed) fins
- h) natural streamlined shape
- i) no significant bleeding in the scale pockets at the anal fin or under the belly membrane

### 5.2.2 Ordinary

A product with limited external or internal faults, damage or defects. The product is without substantial faults, damage or defects which would make further use difficult.

The product shall have the following characteristics at the time of packing:

- a) no tissue damage beneath the skin or in the musculature
- b) no open sores
- c) natural streamlined shape

Nevertheless, the product may have:

- d) damage to the head region or fins
- e) bleeding in scale pockets or at fin supports caused, for instance, by bites from lice or stress
- f) loss of scales
- g) minor skin damage or sores on the upper skin layer, but with the lower layer still intact
- h) moderate bleeding under the belly membrane
- i) minor deposits of melanin in the musculature
- j) faulty cutting, but without extensive damage to musculature
- k) spread fin rays without soft tissue

- l) excessively fat bellies
- m) moderate discolouration caused by gall
- n) deviations in skin colour
- o) moderate external signs of sexual maturity especially in the region of the head. The fish should otherwise be shiny
- p) damaged belly membrane without rifts in the musculature

### 5.2.3 Production

Salmon that do not satisfy the requirements to Superior or Ordinary because of faults, damage or defects are to be sorted into the Production category. The fish are supplied as head off.

Fish with the following characteristics are sorted into this category:

- a) sexual maturity characteristics
- b) sores
  - i) sores on snout
  - ii) open sores
  - iii) damaged, bleeding fins
- c) deformities
  - i) deformed jaw
  - ii) truncated operculum
  - iii) crooked backbone
    - for instance fused vertebrae
  - iv) shortened tail
- d) serious handling defects
  - i) extensive faulty cutting
  - ii) extensive discolouration from gall
  - iii) scales scrapped off
- e) internal quality faults
  - i) significant amounts of melanin in the muscles
  - iv) damage/bruising in muscles caused by blows
- f) substantial scale loss

Fish with these characteristics are governed by § 9-6 (1) of the Norwegian Regulations relating to Fish and Fisheries Products. Pursuant to these regulations

*»Farmed fish are to be graded so that fish with obvious mating colours, sores, deformities, defects from rough handling or internal quality defects, are not sold to the retail trade, catering institutions or consumers. Fish with such defects are only permitted sold to approved establishments in Norway which have the necessary equipment to rectify defects and at which such rectification shall be performed.»*

## 5.3 Product classification

Fish produced and quality graded in accordance with this standard are classified as:

- Norwegian salmon - Superior
- Norwegian salmon - Ordinary
- Norwegian salmon - Production



These industry standards are drawn up by and for the Norwegian Fishing Industry, through the project "Industry Standards for Fish". This work is the joint effort of representatives from more than 20 different fishery enterprises throughout Norway. The project has also included representatives from different fishery organisations, official authorities and research institutions.

The Norwegian Seafood Export Council has assumed formal responsibility, initially for a period of two years, for continuing the work on these voluntary standards for fish and fish products.

All enquiries regarding the industry standards should be addressed to the secretariat, Industry Standards for Fish, Bergen.

#### Industry standards published in 1999

Title	Number
Quality Grading of Farmed Salmon .....	NBS 10-01
Quality Grading of Farmed Rainbow Trout .....	NBS 10-02
Norwegian Premium Smoked Salmon and Rainbow Trout .....	NBS 10-03
Salted Fish and Klippfish Products .....	NBS 20-01
Classification of Stockfish .....	NBS 30-01
Quality Grading of Fresh Fish .....	NBS 40-01
Whitefish Fillets and Fillet Products .....	NBS 40-02
Block Products of Whitefish .....	NBS 40-03
Norwegian Round Herring .....	NBS 50-01
Norwegian Round Mackerel .....	NBS 50-02
Processed Herring Products .....	NBS 50-03
Processed Mackerel Products .....	NBS 50-04
Measuring Central Quality Parameters in Herring and Mackerel .....	NBS 50-05