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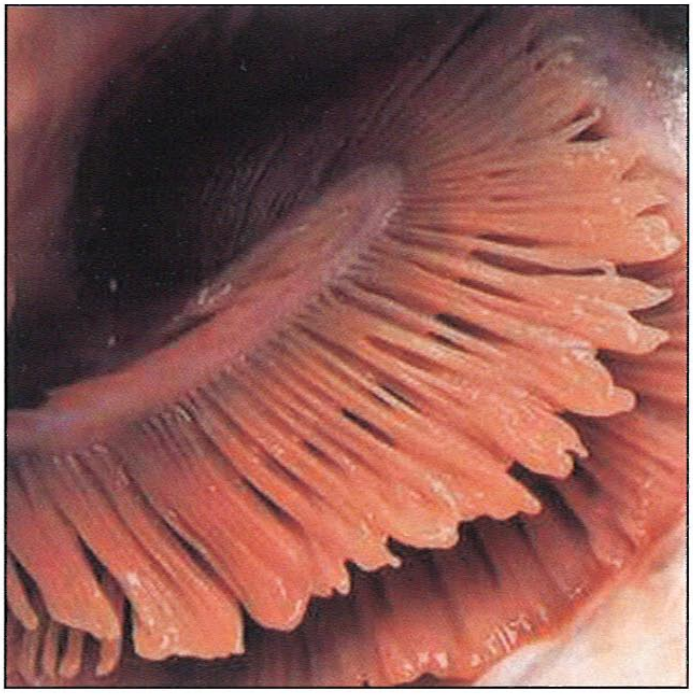

QIM – Quality evaluation of salmon freshness and remaining shelf life

A method is now available to objectively and rapidly evaluate the freshness of fish and estimate the remaining shelf life. This method is called the Quality Index Method (QIM). A QIM manual has been prepared that shows how to utilise this method.

The manual may be obtained from the Internet address www.qim-eurofish.com.

In order to implement a QIM evaluation correctly, it is important that the person has undergone the necessary training. In addition, a minimum of three fish per lot must be evaluated and averaged to reduce the effects of natural variation. According to the method the fish should be stored in ice, at a temperature of 0 °C.

These photos show the development the appearance of the eyes and gills of salmon from Day 0 to Day 20.

The quality index is a score that results from an objective, rapid sensory evaluation of several important quality parameters for the specific fish species. A score is given from 0–1, 0–2 or 0–3 for the changes that occur in appearance, odour, gills, eyes and texture of the whole fish. A score of 0 gives the highest sensory quality or, in other words, the lower the QIM value, the fresher the fish.

When the method was developed, scientific storage trials were carried out in parallel with sensory evaluation of boiled samples by a trained panel of sensory judges. These trials concluded that the maximum storage time in ice for salmon was 20–21 days (Sveinsdottir et al. 2002). Through this work, a linear connection was determined between the quality in-

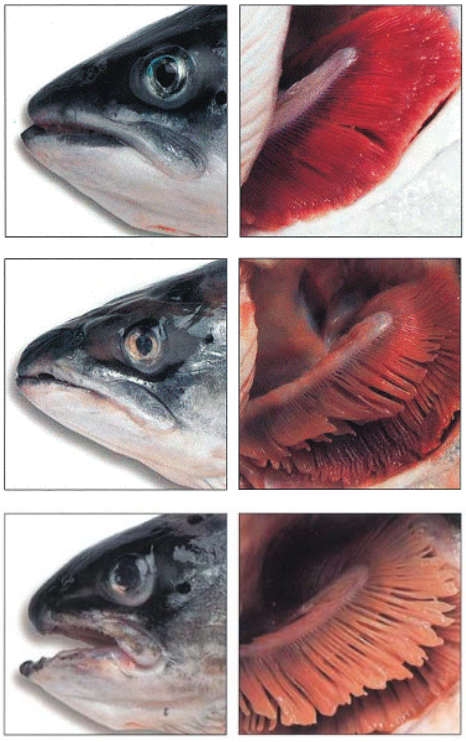

Figure 1. Development from Day 0 to Day 20 on eyes and gills of the salmon.

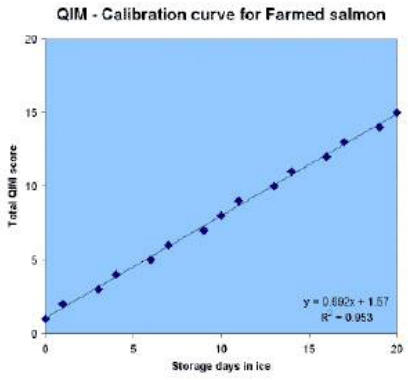

Figure 2. Calibration curve for farmed salmon. The relation between quality index and storage time on ice is linear.

dex and the number of days the fish is stored in ice.

When QIM is implemented on salmon, the form shown in Figure 3 is utilised. The salmon is evaluated in accordance with all the parameters listed on the form. The fish cannot be rejected in relation to shelf life even though one attribute gets the maximum score. As shown in the table below, when a QIM score of 15 is obtained, the salmon has reached the limit for being fit for human consumption. In other words the salmon has 0 days of remaining shelf life.

Quality Index (QIM)	Storage Time (Days)	Remaining Shelf Life
1	0	20
2	1	19
3	3	17
4	4	16
5	6	14
6	7	13
6	9	11
8	10	10
9	11	9
10	13	7
11	14	6
12	16	4
13	17	3
14	19	1
15	20	0

Table 1. Quality Index and Shelf Life

Using QIM is not reliant on knowing the age of the fish, as the method estimates the remaining shelf life of the salmon based on the given quality parameters. Consumers and retailers can use QIM as a rapid and objective method for evaluating the quality of salmon and the remaining shelf life of the fish.

Quality parameter		Description	Score
Skin	Colour/ appearance	Pearl-shiny all over the skin	0
		The skin is less pearl-shiny	1
		The fish is yellowish, mainly near the abdomen	2
	Mucus	Clear, not clotted	0
		Milky, clotted	1
		Yellow and clotted	2
	Odour	Fresh seaweedy, nutral	0
		Cucumber, metal, hay	1
		Sour, dish cloth	2
		Rotten	3
	Texture	In rigor	0
		Finger mark disappears rapidly	1
		Finger leaves mark over 3 seconds	2
Eyes	Pupils	Clear and black, metal shiny	0
		Dark grey	1
		Matt, grey	2
	Form	Convex	0
		Flat	1
		Sunken	2
Gills	Colour	Red/dark brown	0
		Pale red, pink/light brown	1
		Grey-brown, brown, grey, green	2
	Mucus	Transparent	0
		Milky, clotted	1
		Brown, clotted	2
	Odour	Fresh, seaweed	0
		Metal, cucumber	1
		Sour, mouldy	2
		Rotten	3
Abdomen	Blood in abdomen	Blood red/not present	0
		Blood more brown, yellowish	1
	Odour	Neutral	0
		Cucumber, melon	1
		Sour, fermenting	2
		Rotten/rotten cabbage	3
Quality Index			0-24

Figure 3. QIM form for farmed salmon.

The QIM method is based on the result of the EU financed project "Development and Implementation of Computerised Sensory System (QimIT) for Evaluating Fish Freshness".

Reference:
Kolbrun Sveinsdottir, Grethe Hyldig, Emilia Martinsdottir, Bo Jørgensen, Kristberg Kristbergsonn. 2002. Quality Index Methode (QIM) scheme developed for farmed Atlantic salmon (Salmo salar).

Organisations

The Fisheries and Aquaculture Industry Research Fund (FHF) initiates and finances strategic research and development (R&D) projects on behalf of – and in close cooperation with – the Norwegian fishery and aquaculture industry.

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The Norwegian Seafood Federation (FHL) represents the interests of approximately 500 member companies and 8,000 employees. FHL covers the entire value chain from fjord to dinner table in the fisheries and aquaculture sectors in Norway.

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Nofima is a business oriented research group working for the aquaculture, fisheries and food industry in Norway. Nofima shall provide research and solutions at an international level which will give a competitive edge throughout the value chain.

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See www.qim-eurofish.com for more information about the Quality Index Method (QIM).