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Blackspot seabream (*Pagellus bogaraveo*) Quality Index Method (QIM) sensory scheme

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1 Introduction

Among the several sensory, chemical, physical and microbiological methods nowadays available to evaluate seafood freshness, the sensory are the most common and the closest to the used by consumers. They are considered as reference methods and used to validate all others.

The Food Technology Laboratory (LTA) of ICBAS published some of the last QIM (*Quality Index Method)* tables dedicated to locally relevant species, namely: common octopus (*Octopus vulgaris*), cuttlefish (*Sepia officinalis*) and broadtail shortfin squid (*Illex coindetii*), and more recently blackspot seabream (*Pagellus bogaraveo*), a species that shows some potential for aquaculture.

This poster indicates the QIM schemes already published and available and, with some detail, the scheme for the blackspot seabream (common name in Portuguese: *goraz-de-pinta*).

2 QIM schemes published

Common name	Scientific name	Product(s)
Atlantic halibut	*Hippoglossus hippoglosus*	farmed
Herring	*Clupea harengus*	fresh, whole
Haddock	*Melanogrammus aeglefinus*	fresh, gutted
Cod	*Gadus morhua*	fresh, whole
Cod	*Gadus morhua*	fresh, gutted
Cod	*Gadus morhua*	fresh, cooked
Cod	*Gadus morhua*	fresh fillets, open fish
Cod	*Gadus morhua*	defrosted, whole
Cod	*Gadus morhua*	defrosted, fillets
Cod	*Gadus morhua*	defrosted, cooked fillets
Anchovy	*Engraulis encrasicholus*	fresh, whole
Shrimp	*Pandalus borealis*	fresh, whole
Shrimp	*Pandalus borealis*	cooked, peeled
Shrimp	*Litopenaeus vannamei*	fresh, whole, farmed
Horse mackerel (or scad)	*Trachurus trachurus*	fresh, whole
Cuttlefish	*Sepia officinalis*	fresh, whole, washed
Cuttlefish	*Sepia officinalis*	fresh, whole, unwashed
Seabream	*Sparus aurata*	fresh, whole
European eel	*Anguilla anguilla*	fresh, gutted, farmed
Pollock	*Pollachius virens*	fresh, gutted
Pollock	*Pollachius virens*	fresh, whole
Frigate tuna	*Auxis thazard*	fresh, whole
Senegalese sole	*Solea senegalensis*	fresh, whole, farmed
Sole	*Solea vulgaris*	fresh, whole
Silver scabbard	*Lepidopus caudatus*	fresh, whole
Black scabbard	*Aphanopus carbo*	fresh, whole
Redfish	*Sebastes mentella, S. marinus*	fresh, whole
Hake	*Merluccius merluccius*	fresh, whole
Octopus	*Octopus vulgaris*	fresh, whole
Broadtail shortfin quid	*Illex condetti*	fresh, whole
Turbot	*Scophtalmus maximus*	fresh, whole
Sea bass	*Dicentrarchus labrax*	fresh, whole, wild, farmed
Hybrid striped bass	*Morone saxalis, M. chrysops*	fresh, whole, farmed
Brill	*Scophthalmus rhombus*	fresh, whole
Atlantic salmon	*Salmo salar*	fresh, whole, farmed
Artic charr	*Salvelinus alpinus*	fresh, whole, farmed
Mackerel	*Scomber scombrus*	fresh, whole
European sardine	*Sardina pilchardus*	fresh, whole
Australian sardine	*Sardinops sagax*	fresh, whole
Flounder	*Platichthys flesus*	
Plaice	*Pleuronectes platessa*	fresh, whole
Flounder	*Paralichthys patagonicus*	fresh, whole
Dab	*Limanda limanda*	
Spotted trevalla	*Seriolella punctata*	fresh, whole
Rainbow trout	*Oncorhynchus mykiss*	whole, farmed
Blackspot seabream	*Pagellus bogaraveo*	fresh, whole

Key to symbols: Portugal ICBAS IPIMAR/INRB

3 Main characteristics of the QIM system

A QIM scheme is based on the observation and careful registration of seafood changes during their degradation, until they reach a rejection point, defined mainly by external sensory characteristics (*e.g.* appearance, brightness and mucus in whole fish and/or muscle), and/or evaluated by a panel (*e.g.* smell, flavour and texture, in fillets) and generally complemented by physical, chemical and/or microbiological analysis.

Most relevant characteristics are used to build a table, in which increasing points are attributed along the degradation in ice.

The system, after testing and fine tuning, validation and final adjustments, allows the estimation of the corresponding time in ice ("icedays") and also prediction of the remaining shelf-life until rejection. The precision is around 1 iceday, much higher than the previous European Union sensory scheme, which is about 2 icedays.

4 Blackspot seabream QIM scheme

Fig. 1 - Analysing blackspot seabream (*Pagellus bogaraveo*) sensory characteristics to build its QIM table.

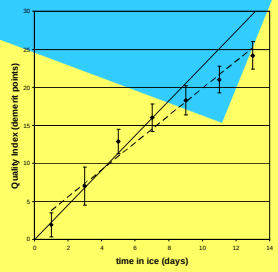

Fig. 2 - Blackspot seabream Quality Index *vs* icedays.
Filled line (——) is theoretical;
Dashed line (– –) and diamonds (♦ *s.d.*) are obtained data.
Rejection is attained at day 12-13 (30 demerit points)

Table 1 - QIM scheme of whole iceboxed blackspot seabream (*Pagellus bogaraveo*). From Sant'Ana, Soares & Vaz-Pires (2011), article front page at left.

Quality attribute	Parameter		
Appearance	Dorsal skin	Bright, iridescent, salmon	0
		Slightly bright	1
		Pale, dull	2
	Belly and operculum	Grey, silver	0
		Grey, yellowish spots	1
		Grey, brown spots	2
	Odour	Fresh, sea weedy	0
		Neutral	1
		Sour milky	2
		Metallic	3
Texture	Firmness	Firm	0
		Rather soft	1
		Very soft	2
Mouth	Resistance	Very	0
		Little	1
		Without	2
	Colour	Pinky	0
		Yellowish	1
Anal area	Mucus	Absent	0
		Present	1
	Appearance	Shut	0
		Open	1
		Excessively open	2
Eyes	Cornea	Clear, translucent	0
		Opaque and/or red	1
		Milky, gelatinous	2
	Pupil	Black, bright, shiny	0
		Slight milky, opaque	1
		Milky, white, opaque	2
	Shape	Plane	0
		Convex	1
		Concave	2
		Deformed	3
Gills	Colour	Bright red	0
		Red, light brown	1
		Brown and/or greenish	2
	Mucus	Absent	0
		Transparent, gelatinous	1
		Milky	2
		Transparent, watery	3
	Odour	Sea weedy	0
		Neutral	1
		Rotten and/or metallic	2
Total QIM score			0-30

5 Conclusion

The QIM system is modern and precise, allowing a rapid answer without sample destruction. Presumptively, it will be increasingly used at labs and all seafood chain.

The existence of QIM tables for wild and farmed species and products is useful and will be continued at the LTA of ICBAS. QIM tables allow a very precise evaluation and the prediction of the remaining shelf-life, minimizing effort and cost.

The differences between theoretical and obtained line, as they occur mainly at the end of the curve (less relevant portion), are not considered crucial, but further adjustments are needed to improve this point.