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INTRODUCTION OF THE QUALITY INDEX METHOD (QIM) IN THE EUROPEAN FISHERY CHAIN (QIMCHAIN)

FIRST CONSOLIDATED PROGESS REPORT

ACCOMPANYING MEASURE CONTRACT No. QLK1-CT-2002-30152

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Skýrsluágrip Rannsóknastofnunar fiskiðnaðarins

Icelandic Fisheries Laboratories Report Summary

Titill / Title	Introduction of Quality Index method (QIM) in the European Fishery Chain- First Consolidated Progress Report		
Höfundar / Authors	*Emilía Martinsdóttir*		
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Ágrip á íslensku:

Verkefnið felst í því að kynna gæðastuðulsaðferðina QIM fyrir fiskiðnaði í Evrópu og stuðla að því að samræmd aðferð verði tekin upp í skynmati á ferskum fiski. Samræmd aðferð við mat á ferskum fiski mun greiða fyrir viðskiptum með fisk á fiskmörkuðum og vera nauðsynlegur þáttur í í framleiðslu- og gæðastýringu í fiskiðnaði. Á fyrra ári verkefnisins var lögð mest áhersla á kynningu fyrir fiskmarkaði og aðra aðila í Bretlandi. Í verkefninu hefur QIM verið kynnt á fjórum sjávarútvegssýningum í Evrópu, greinar skrifaðar í blöð og tímarit, handbók um skynmat á ferskum fiski mun verða þýdd á 10 tungumál og reynt hefur að skapa umræðu um ferskfiskmat með þáttöku á fundum hjá hagsmunaaðilum. Heimasíða verkefnisins er www.qim-eurofish.com og þar eru birtir QIM einkunnaskalar sem eru til á ensku.

Lykilorð á íslensku: *QIM, gæðastuðulsaðferð, ferskleiki, fiskur, skynmat QIM*

Summary in English:

The Quality Index Method (QIM) is a seafood freshness quality control system. The main objectives of this project are: to introduce the Quality Index Method (QIM) and stimulate the implementation of QIM in the relevant parts of the European fishery chain to facilitate fish trade and improve quality assurance. The main emphasis this first year of the project has been on introduction of for fish auctions, fish industrial oriented agencies, and companies in UK. Translations of multilingual guidelines and reference manuals for end-users in 10 languages are proceeding effectively. The QIM method has been demonstrated by participation at 4 important European fish exhibitions. Articles in international industry orientated, and consumer oriented journals and in national journals have been written. The existing QIM-schemes in English and photos are now published on the web-site(www.qim-eurofish.com)

English keywords: *QIM, Fish, Sensory, Quality, Freshness*

PROGRESS REPORT

Title of the project: Introduction of Quality Index method (QIM) in the European Fishery Chain		
Acronym of the project QIMCHAIN		
Type of contract QLAM		Total project cost (in euro) 316756 €
Contract number QLK1-CT-2002-30152	Duration (in months) 24 Months	EU contribution (in euro) 316756 € 316756 €
Commencement date 1. August 2002	Period covered by the progress report (e.g. 1 February 2000 – 31 January 2001) 1. August 2002 – 31. July 2003	
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Key words (5 maximum - Please include specific keywords that best describe the project.). QIM, Fish, Sensory, Quality, Freshness		
World wide web address (the project's www address) **www.qim-eurofish.com**		

List of participants **Provide all partners' details including their legal status in the contract i.e.,contractor, assistant contractor (to which contractor?).**

All partners are contractors

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1. CONSOLIDATED PROGRESS REPORT

1.1. Objectives

To introduce the Quality Index Method (QIM) and stimulate the implementation of QIM in the relevant parts of the European fishery chain to facilitate fish trade, improve quality assurance and ensure traceability of quality information of fish for European consumers

To enhance the European dimension of the exploitation of research results on QIM in the European fish sector

To raise the awareness of the benefits of using standardised methods for evaluating fish freshness in Europe

To identify the need for further research in this field to be able to provide the European fish sector with multilingual tool for all important fish species

This objective must be achieved through several sub-objectives:

Creating and establishing QIM network-platform for partners in the fishery chain, authorities and scientists. Emphasis must be on active participation of fishermen, auctions, processors and retailers (including supermarkets). National and European associations of the respective stakeholders must be approached.

Organisation of two QIM workshops for demonstration of the effectiveness and user-friendliness of the QIM scheme to the European fish sector. Industrial key end-users of QIM already existing must be involved.

Development of multi-lingual (computerised) sensory evaluation reference manual and guidelines for practical application of QIM for end-users e.g. fish-auctions, fish processing industry, retailers, inspection bodies and research institutes.

Active dissemination of QIM knowledge by participation at important European fish exhibitions.

Information about QIM methodologies and practical applications must be published in popular fish trade journals at national and European level.

Creation of web-site with detailed information on QIM.

1.2. Description of work

The formation of the QIM-network has been started both by meetings organised and planned by the participants in collaboration with stakeholders and also by taking part in meetings planned and organised by others. These meeting already hold have initiated to a nucleus of a network consisting of the partners from QIM Eurofish. This nucleus together with the other partners in the project are creating by means of meetings a European network including also other relevant key actors in the fishery chain, authorities and scientists from the various European countries who are interested in QIM implementation. The main emphasis this first year of the project has been on introduction of for fish auctions, fish industrial oriented agencies, and companies QIM in UK.

Project members have sought the opportunity to participate in ongoing meetings (e.g. annual meetings) already established by the actors in the chain to give information about QIM. Discussion about QIM has been established at various conferences and workshops both for researchers and the fish industry to identify the needs for further research in this field taking into account different views. Additionally authorities in Brussels have been informed.
Preparation have been performed for holding two workshops aimed for fish sector in selected European countries and the most possible countries are Spain, UK and France.

Material for translation of guidelines and reference multilingual manual for education, training and easy application of QIM in the fish sector has been delivered to all project participants and subcontractors (totally 10 languages). The translation of text and tables has been finished and delivered in 3 languages. Danish, Dutch, Portuguese, finished in Icelandic Norwegian and Spanish and the translations have started in German and Greek, Italian and French

The usefulness and effectiveness of QIM for improving fish quality have been demonstrated by t participation at 5 important European fish exhibitions.

Articles on the QIM method and the possibilities of using the method have been published in fish trade journals 3 at national level and 2 articles in a book. Scientific articles are under preparation.

A web-site that offers information to all interested parties about QIM and status and possibilities of using QIM have been created .and maintained from the beginning of the project and contains information about the project, its status, progress and other relevant information. The existing QIM-schemes in English and photos are now published on the web-site. The web site must also be an active forum for the QIM network.

1.3. Results and deliverables

All the results from individual work-packages are shown in more details later in the report

The development of QIM platform scientists and network for partners in the fishery chain, authorities and has made in 2003 considerable progress with a new or stronger involvement of various partners from scientific institutes and from the fishery chain. There seems to be a need in the fishery chain also to involve other criteria in classifying the quality of landed fish than only the freshness. Translating the quality of handling the catch on board of the vessels into a catch quality index could be an interesting option for a common European strategy for research and fishermen. Small workshops aimed for the fish sector in selected European countries have been held. Translations of multilingual guidelines and reference manuals for end-users in 10 languages is proceeding effectively. Demonstration and presentations have already been done in four important fishery exhibitions in Europe. Articles in international industry orientated, and consumer oriented journals and in national journals have been written Web-site used as an active platform for the network is visited many visitors every day. The knowledge about QIM has spread in the fish sector, authorities and the scientific community and will lead to increased implementation and practical application of QIM in the European fish sector.

1.4. Dissemination of research results

Meetings

QIMCHAIN tour in Ireland and United Kingdom June 2003: Meetings with workshops at the fish auction Fishgate in Hull,BIM in Dublin , Sea Fish Industry Authorities in Hull

Meeting with European Association of Fishing Ports and Auctions (EAFPA) and DG XIV in Brussels in May 2003

Meetings with The Netherlands Organisation of Fish Auctions (NOVA) and the Dutch Board for Fisheries (PVis) and the The Fisheries Research Station (FRS) in Oostende (Belgium)

Lectures given at:

the Baltic Region Quality Fish Forum,. April 10-11, 2003 in Pori (Finland, European Sensory Network Seminar: Using sensory analysis in food product development and quality control 21-22 November 2002, Budapest, Hungary

International Quality Retail Conference November 2002 **,**Hamburg, Germany

FAIRFLOW-meeting, 25, Oct, 2002, Reykjavik, Iceland

Posters were demonstrated at

SEAFOODplus workshop at European Research 2002, Brussels 11-13 November 2002

the First Joint Trans-Atlantic Fisheries Technology Conference (TAFT)-33rd WEFTA Meeting and 48th Atlantic Fisheries Technology Conference, 11-14 June 2003, Reykjavik - Iceland 2003

Publications:

Rf-Report Sensory Evaluation of Fish Freshness by QIM-method. Emilia Martinsdottir, Kolbrún Sveinsdóttir, Ása Thorkelsdóttir and Bjarni Áskelsson Icelandic union of Fish Auctions

Rian Schelvis. Kwaliteits Index Methode: De beste manier om de versheid van vis te bepalen. Vleesindustrie Januari 2003 (18-19).

Emilía Martinsdóttir, Icelandic Fisheries Laboratories, How fresh is your fish? , Food Ingredients Sensorik, Newsletter, Behr´s Verlag Hamburg , Germany, October 2002

Emilía Martinsdottir and Bjarni Askelsson (Federation of fish auctions). Evaluation of fish quality at fish auctions in Iceland . Aegir 96, 4 2003 30 – 33

E. Martinsdóttir J.B. Luten, Schelvis-Smit, A.A.M and Hyldig G. 2003. Scientific developments of QIM - past and future. Quality of Fish from Catch to Consumer. Eds. J.B. Luten, J. Oehlenschlåger,G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

Schelvis-Smit, A.A.M and J.B. Luten,. 2003. Catch Index: Developmen of a tool for measurement of the quality of the catch handling at sea. Quality of Fish from Catch to Consumer. Eds. J.B. Luten, J. Oehlenschlåger,G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

The homepage of the project is: **www.qim-eurofish.com**.

Schemes Quality Index method schemes are presented at the web-page

Supporting documentation of all activities accompany this report as Appendices

1.5. Future actions

It was agreed that a representative form the QIMCHAIN project will be invited at the next annual meeting of the EAFPA, probably to be held during the seafood exhibition in Vigo, September 2003.

The next year of the QIMCHAIN project the network will be extended towards the south of Europe. Via the contacts of the EAFPA meeting in Vigo, interested French auctions will be visited similar to the tour in UK. There will be a follow-up in UK where other companies and auctions shown their interest will be visited.

Participation at 4 fish exhibitions is scheduled

The translations and printing of the reference manual in 10 countries will be finished

Scientific articles on the use of QIM methods and more articles in magazines at European level will be published.

The feasibility of the use of streaming video technology at the website for giving information about QIM will be evaluated. This upcoming technique may enhance the effect of transferring knowledge to the users in the chain

The website must be maintained after the lifetime of the accompanying measure by the QIM Eurofish alliance.

1.6. Action requested from the Commission

Not relevant

2. PROGRESS REPORT OF WORKPACKAGE 1 - QIM NETWORK-PLATFORM

2.1 Objectives

The objective is to introduce the Quality Index Method (QIM) and to stimulate the implementation of QIM in the relevant parts of the European fishery chain to facilitate fish trade, improve quality assurance and ensure traceability of quality information of fish for European consumers. The objective must be achieved by creating and establishing QIM network-platform for partners in the fishery chain, for authorities and scientists. Emphasis must be on active participation of fishermen, auctions, processors and retailers (including supermarkets).

The aim is to raise the awareness of the benefits of using standardised methods for evaluating fish freshness in Europe.

The aim is also to identify the need for further research in the area of valid methods to evaluate fish quality to be able to provide the European fish sector with multilingual tool for all important fish species.

2.2. Description of work

All information of these dissemination's activities have been reported on the website in order to inform all members of the network.

In a systematic way key actors in the chain with emphasis on, fish auctions in the various countries must were approached by the members of the project. The main target group this year were fish auctions but also the organisations

All the research organisations are members of WEFTA (Western European Fish Technologists Association). Researchers in Europe must be informed at annual WEFTA-meetings 2002 and 2003 and discussions encouraged to identify the need for further research in the field. A poster was presented at the TAFT 2003 meeting

2.3. Results and deliverables

Widespread knowledge about QIM for evaluating fish freshness have been disseminated throughout the fish sector, the scientific community and authorities by this pan-European activity. The European dimension of the fish sector using research results on QIM have be enhanced and the awareness raised of the benefits of using standardised methods for evaluating fish freshness in Europe.

It was decided that the fish auctions should be the main target groups the first year of the project

2.3.1. QIMCHAIN tour in Ireland and United Kingdom June 2003

In May 2003 arrangements were made for a QIMchain tour in Ireland and United Kingdom. These countries were selected based upon previous interest in QIM from the fish industrial oriented agencies BIM in Dublin, Sea Fish Industry Authorities (SFIA) in Hull, the auction 'Fishgate' in Hull and the company Young's Bluecrest in Humberside during the EU Concerted Action 'Fish Quality Labelling and Monitoring'. Visits to BIM, SFIA and Fishgate have been realized. The visit to Young's Bluecrest was postponed due to other obligations of staff of Young's Bluecrest. Meeting is scheduled for second half year of 2003

The general aim of the QIMchain tour was to stimulate the use of QIM and to make more partners in the fishery chain aware of the benefits of QIM. If useful, hands-on demonstration of QIM was given. Also the exchange of experiences in QIM and establishment the needs from partners in the chain was an important topic during the tour.

The presentation given by Rian Schelvis-Smit, RIVO in is in Appendix 1

2.3.2. Visit BIM Dublin

The BIM quality team of Ian Lawler, Catharine Barrett and Michael Gallagher were hosting the meeting. Participants, invited by BIM, were:

Martina Clarke: Development officer for Irish Association of Seafood Companies (IASC),Alan Mc Kenna: Chairman of IASC, David Lyons: Food Safety Authority of Ireland: Marine contracts manager, Cormac Craven: Sea fishery officer, Department of Communications, Marine and natural resources, June Frisby: Dublin City University, research student on Radio Frequency automated temperature loggers and fish spoilage, Kim Loo: Dublin City University, Post doc on Fish spoilage working on a freshness meter, Carol Rafferty: Head of the lab in BIM, Michael Gallagher: BIM, Stuart McWilliams: BIM, Catharine Barrett: BIM, Susan Steele: BIM tutor in the Castletownbere fishery school via video link, Ronan Gormley: The National Food Centre, John Fagan: The National Food Centre.

Catharine Barrett (BIM) presented the aims of an on-going research project with Seafood Scotland Agency among others in which QIM and GMP are essential elements. This project is funded by trans-national EU funds. It is a similar project, which was presented at the WEFTA meeting 2002. The targets are:

To assist industry in the implementation of legislation relating to food safety, health and hygiene, traceability etc.

To provide a monitoring structure on how fish quality and handling can be independently assessed and to promote food safety, quality and technical excellence under one banner

To support and execute targets of the various proposed schemes associated with technological development in quality and traceability

The assessments in the project are dealing with on-board assessment (vessel hygiene, fish handling) and quality assessment (freshness and quality handling). EU quality grades and subclasses (E, A+, A, A-, B) were used. However it was based upon a freshness and handling evaluation. Freshness determination at BIM has similar approach like the QIM method. The differences between QIM (by QIMEurofish) and “freshness+quality” determination (by BIM) are shown in Table 1.

Table 1. Comparison of QIM and Frehness+Quality

QIM by QIM Eurofish	Freshness by BIM	Notes
Skin (4 items), eyes (2 items,), colour (3 items), abdomen (2 items). Within each item 3 score levels and corresponding description	Skin, eyes, gills, blood, odour and rigor. In each item 5 score levels and corresponding description.	Number of descriptions for QIM items to be assessed is larger than in BIM approach. BIM approach is not resulting in scientifically proven relation between freshness and time
3-5 fishes per lot	10 fishes per lot	BIM approach will take more time
Score for attributes unweighted	Score for attributed are weighted	Necessity of weighing factors for scores by BIM is not explicitly given
Possibility to determine storage time in ice (catch date) and remaining shelf life	No possibility to determine storage time in ice (day of catch) and remaining shelf life	The outcome of CA-FILM showed the need in the chain for information about day of catch, storage time on ice, remaining shelf life.
Simple calculating (summing up)	'Complicated' calculating procedure	Minor to overcome difference

However BIM takes also the handling aspects (gutting, washing and boxing) into account for a final Quality Assessment Grade. Both aspects freshness and handling results in a grading of E, A+, A, A- or B for the fish.

The QIMCHAIN team member Rian Schelvis presented the basic principles of QIM and the state of the art in Europe as well the aims of QIMCHAIN project. A short video film about the QIM implementation in the Dutch auction of Scheveningen was also shown. Joop Luten, member of the QIMCHAIN team, emphasized in his introduction to follow a common harmonized strategy in Europe for the implementation of QIM and in particular the connection of the QIM results with EU classifications.

In the discussion the QIMCHAIN project team members and the BIM representatives and Irish representatives of the fisheries sector agreed that the procedure followed by BIM was not dealing with freshness but also with handling. QIM is focused on freshness, which is essential for EU grading. Although handling is an important quality issue demanded by the fish trade, it was agreed that we should not mix those items for classifications in EU grades. This approach is conflicting with the EU grading objectives and may work rather confusing to the partners in the chain.

Therefore the QIMCHAIN proposed harmonization of the BIM approach to QIM reference method. Also the QIM method applied by BIM is not according the reference method developed in Europe.

Rian Schelvis, Catharine Barrett and Michael Gallagher gave a hands-on QIM demonstration for the participants on salmon, plaice, haddock, monkfish and mackerel with different freshness. In this way it was shown again that it is rather easy to learn the basics behind the methodology in particular for those who have experience in quality assessment of fish.

All participants agreed that QIM is a good reference method for freshness determination. Alan Mc Kenna, chairman of IASC was also in favour to involve other elements in the assessment which are important in the buying decision making process.

Catharine Barrett (BIM) and David Lyons from Food Safety Authority of Ireland at hands-on QIM demonstration.

2.3.4. Visit to Sea Fish Industry Authorities in Hull

The QIMCHAIN team visited the Technology Department of Sea Fish Industry Authority (SFIA) in Hull. Wesley Denton is head of the Department Technology.
This department deals with the commercial handling, processing and distribution of fish and shellfish from capture to consumption. They carry out technical development projects, establish good manufacturing practice standards for industry and advise industry and government on matters concerning fish technology. One of the activities deals with good manufacturing practice (GMP) guidance for industry. They draft guidelines in collaboration with industry representatives and the enforcement agencies. The standards also provide a basis for further activities such as training and quality assurance schemes.

Currently the team is working on fish quality items:

- The application of a standardized fish freshness assessment system (QIM)
- Further work on determining the effects of capture techniques on fish quality
- The application of pumpable ice technology.

Work on QIM sensory assessment includes the commercial development of a handheld data capture, analysis and communication device. Work on fish capture techniques has shown their importance to fish quality and is being extended to include the effects of trawl tow times. Pumpable ice offers chilling benefits in a range of commercial circumstances at sea and ashore.

During the meeting Rian Schelvis and Joop Luten and the staff of Sea Fish Industry Authority (SFIA) exchanged information and future possibilities of QIM in United Kingdom. Within SFIA several seafood quality inspectors are involved in quality assessment of seafood in the industry. Adrian Barratt (senior quality advisor of SFIA) is responsible for these activities. SFIA staff is very experienced with the Torry schemes for quality assessment of fish. Michael Anyadiegwu is as fish technologist involved in a internal SFIA QIM project. Richard Watson (Senior Fish Technologist of SFIA) explained that SFIA has come to the conclusion that it is necessary to train the SFIA staff on QIM for several research projects. It was agreed that RIVO would prepare a tender document for a QIM training for SFIA staff. This tender document has been accepted recently. The training will be carried out in September-October 2003.

Michael Anyadiegwu explained the project dealing with the development of the handheld data capture instrument for QIM. It is primary the goal to use the instrument for training purposes at SFIA and industry. At this moment it is not the aim to commercialize the instrument. The treatment of the data captured is relatively simple in comparison to Wisefresh software. But the instrument shows its potential for training purposes.

From left to right: Rian Schelvis (RIVO), Adrian Barratt (SFIA), Peter Wilson (SFIA) and Michael Anyadiegwu (SFIA)

2.3.5. Visit to Fishgate

Fishgate is the new name for the fresh market in Hull. With an investment of over £5 million by a range of stakeholders representing all aspects of the fish industry in Hull, Fishgate aims to raise the standards of quality of the fish brought into the UK through the Humber ports. The aim is to bring

to auction a high quality product by the use of modern food processing standards and the latest technology. The modern plant and facilities ensures that fish:

Is fully traceable

is accurately weighted

is held in a controlled environment throughout processing

is sold in a transparent and fair way

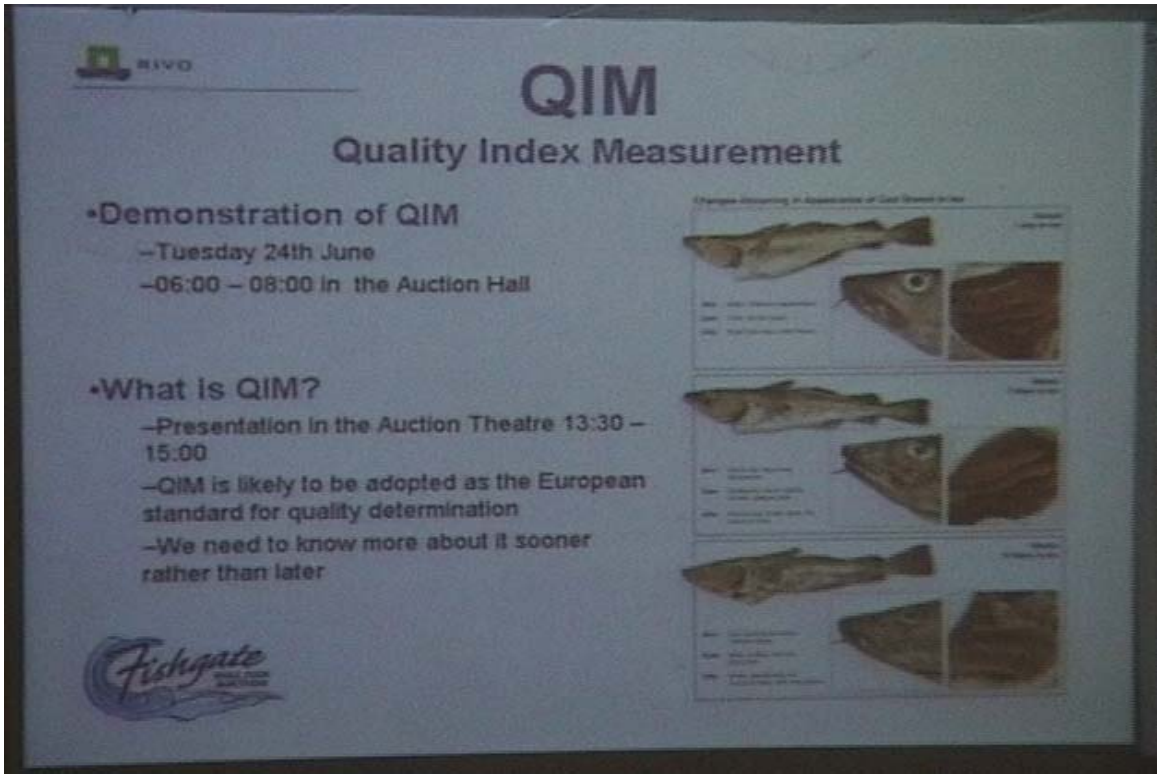
is able to be bought remotely using an Intranet connection

Remote buying is one the driven forces for the need of an objective standardized method for assessing the freshness of the landed fish.

Alan Hopper and Kristjon Bergmundsson were the hosts for the visit of the QIMchain team. On 24th June a practical demonstrations of QIM was given in the storage hall of Fishgate. The fishing vessel DalaRafn provided samples of cod, haddock and plaice and these were caught on 17th June in Icelandic waters. The market demonstration took place between 0600 and 0800 and was seen by a number of buyers, guests from Safeways and the Public Health officials. SFIA staff was also present. The results from the hands on demonstration showed that QIM could classify the landed fish in a correct way into different freshness classes. A lecture in the afternoon was given in the Auction Theatre of Fishgate by Rian Schelvis and was attended by 14 people.

Hands-on demonstration of QIM to buyers at Fishgate

For the majority of buyers who buy daily on Hull Fish Auction and rely on their own judgement there was a lukewarm interest in QIM. The event had been well published by Fishgate in the week prior to it and again on the Monday, 23rd.



This lack of interest should not be taken as a rejection of QIM but possibly it is seen as irrelevant to the small buyers at this time. When Fishgate goes on line with Shetland and hopefully Dutch auctions, it should be possible to re- kindle an interest.

The view of the different participants was following:

David Latus, Buyer and Chairman of the Hull Fish Merchants' Association

He is positively inclined to the use of QIM, and has recommended to the Board of the Fish Merchants' that they support this scheme through its development and evaluation stage. He said that Barry Midgley, who was also one of the Buyers present in the morning, endorsed this view as well. The main problem is that QIM does not tell the whole story and there is a need for other information such as thinness of the fish after spawning.

John Hooper, Smales & Co., Quality Manager

He is very open-minded but emphasises in his Company fish quality and shelf life are absolutely crucial. He sees QIM as an extra tool and bonus if it can be established. He uses the Torry system at present but likes the style of QIM. He said the most important thing was to know how much shelf life remained in the fish at purchase. He is interested in some of the other developments of QIM mentioned by Rian Schelvis and Joop Luten.

Andrew Mills, Quality Assurance Manager at 3 Oceans Limited

The company 3 Oceans mainly specialise in frozen fish and therefore his interest is academic rather than practical. He has a strong preference for the Torry system but is willing to be converted. He has no confidence in the computer system working successfully in a wet environment.

Paul Turner, Environmental Health Inspector, Hull City Council

They are only concerned with fish that is unfit for human consumption and he does not need a QIM score for that. However, he and his team are enthusiastic about QIM and they see a possible role for themselves in becoming experts and therefore arbiters in any disputes. Conclusion – very enthusiastic and can see the potential. They would like to be associated with next stage developments and become trained if that is possible.

Trevor Briggs, Fish Merchant and Remote Buyer from Grimsby

He was the most helpful of all the interviewees and would like to see QIM established as an aid to his decision-making. He sees the overall benefits especially to remote buyers but emphasised that Fishgate will have to make a number of organisational changes of which QIM is only part of the solution and not a total solution. He also stressed the importance of having additional information about the condition of the fish and any weedy odours.

Barry Midgley, Buyer, B Midgley Fish Processing Limited

A similar positive view as David Latus**. He also** stressed that QIM gave quality on the basis of days on ice but ignored the intrinsic qualities coming from seasonal changes and strong flavours from feeding conditions

Jim Walmsley, Buyer

He did not attend either session, but he picked up enough information to be supportive of further work**.**

Bill Glenton, Buyer and Fishmonger

He did not see the relevance of QIM to his business, which is to buy small quantities each morning on the market for which he makes his own quality judgement. This view is probably similar to the majority of small buyers. After some explanation to him he began to see its value in a general sense especially if the opportunity should arise for him to buy on other markets.

Nick Purdy, Buyer, Director of Fishgate and AE Purdy Ltd.

Much the same view as Latus and Midgley but highlighted the fact that he had bought some very fresh fish from the Faroe Islands this week which would have probably had a score on QIM of less than 4 but because it was thin and soft he could not use it.

In general the response was of encouragement to develop the system as quickly as possible and to help everybody gain confidence. Somehow the Fishgate management must find a way to build in other descriptors of the intrinsic quality.

There is wide spread support amongst those who either appreciate the importance of remote buying or are already involved in it.

Doug Harrison visited the Netherlands (10 – 11 April 2002) to get information about the state of the art of QIM in practice (funded by Fishgate, Hull). The main aims of this visit:

To gain more information on QIM in theory and practice and know what is the level of training of staff at the auctions, in respect to food safety. Also To know how fish is graded for quality at the auctions and how is this related to 'home-buying'.

2.3.6. European Association of Fishing Ports and Auctions

Joop Luten was invited by DG XIV Fisheries to attend a meeting with the European Association of Fishing Ports and Auctions (EAFPA) and DG XIV. About 10 representatives from the EAFPA attended this meeting. The EAFPA, chaired by Alain Schlesser has raised three questions related to quality (QIM):

- Where do we stand on quality schemes?
- What is going to be the role of auctions on this subject?
- What is the follow up of the studies carried so far?

The results of the Concerted Action 'Fish Quality Labelling and Monitoring' was presented and in particular the results on QIM. It appears that there is interest in the QIM methodology. But there is still a lack of information for several members of the EAFPA In the meeting in Brussels there was limited time to discuss in detail the (dis)advantages of QIM, the new developments in order to overcome 'experienced' obstacles for QIM assessment, training facilities, QIM software.

It was agreed that a representative form the QIMCHAIN project will be invited at the next annual meeting of the EAFPA, probably to be held during the seafood exhibition in Vigo, September 2003.

Several representatives of EAFPA were sent a summary of the presentation (see appendix 2).

It is very important to know the needs from the European auctions and ports with respect to quality assessment. In our opinion QIM could contribute to the objectives of the EAFPA, as presented in the Brussels meeting, in order to strengthen the position of auction in the fishery chain.

2.3.7. Netherlands Organisation of Fish Auctions

The Netherlands Organisation of Fish Auctions (NOVA) and the Dutch Board for Fisheries (PVis) have approached RIVO for a discussion about the state of the art on QIM and the need of auctions and (remote) buyers for an implementation of QIM. Although the experienced disadvantages (e.g. time consuming) should be reduced. Based upon the needs expressed by NOVA, a possible concept for QIMscan was presented recently. In accordance with the BIM meeting, it is also clear from this

meeting that there is a request from buyers to involve also other quality elements like handling. However PVis and NOVA agreed that EU grading into E, A and B and subclasses should only be based on freshness by QIM.

2.3.8. Flemish fish auctions

The Fisheries Research Station (FRS) in Oostende (Belgium) is involved in a Flemish regional project for improvement fish quality in auctions. Karen Bekaert, project leader on behalf of FRS has approached RIVO to help in the development of 10 new QIM schemes in 2003-2004. RIVO and FRS have been working together several years in the implementation of QIM in Belgium auctions.

During a visit from Karen Bekaert from DVZ Oostende, introduction of 6 hours on the development of QIM schemes as preparation for the development of 10 to 12 QIM schemes for new species in Belgium. Within this project QIM-EUROFISH (i.e. RIVO) will assist in validation and advice.

2.3.9. Icelandic fish auctions

In January and February 2003 four one-days courses to introduce the QIM-method for quality managers in Icelandic fish auctions have been held. About 60 participants attended the courses. During each course lectures were given and practical sessions with demonstrations on the use of the method. The courses were managed by Emilia Martinsdóttir, Kolbrún Sveinsdóttir and Ása Thorkelsdóttir, Icelandic Fisheries Laboratories. The results of the courses were published in an Icelandic report (Emilia Martinsdottir, Kolbrún Sveinsdóttir, Ása Thorkelsdóttir and Bjarni Áskelsson Icelandic union of Fish Auctions Sensory Evaluation of Fish Freshness by QIM-method Rf-Report 04-03.) The main conclusions were that the participants thought it wad easy to learn the method and during this one-day course they managed to be confident with the use of it. They would need more training before they establish the method at their premises. During discussion they said that many of the buyers have knowledge on the quality of the vessels. Now transport of fish has increased at this would be a very valuable tool for the sellers of buyers to speak the same language on the freshness stage of the fish

The general conclusion was that simple rapid methods are needed in-line for the processing industry as well as reliable standardised methods to be used at fish auctions and in the trade of fish. Freshness is key element in the quality assessment of fish by the consumers. Fish is very perishable and has limited storage life. The keeping quality is highly dependent on various factors during handling and storage of the fish in the chain from catch to the consumers However; in production of high-quality food today more detailed information is needed on the quality of the raw materials and products. For production and quality management information on the freshness of the raw materials and products must be essential. Fish trade via e-commerce is growing and information on the freshness and quality of fish traded unseen must be as inevitable as information on the price given. More information on quality using standardised methods measuring the freshness of fish during handling, processing and storage will encourage better handling of fish.

Standardised method for evaluation of fish freshness in Europe is expected to facilitate communication between buyers and sellers of fish and fulfil demands of inspection authorities and regulations. It would be very useful for traceable information regarding fish quality throughout the whole fishery chain. It would also enhance the efficiency of electronic commerce via remote fish auctions and quality- and process management in the fish industry.

2.3.10. Hungary and the Baltic countries

At the Baltic Region Quality Fish Forum, held on April 10-11, 2003 in Pori (Finland), the objectives of the conference was to establish common quality and product specifications for Baltic Sea fish and fish products in Baltic fish trade and consumer markets; to propose common standards, rules and practises to be approved by national and EU officials; to improve quality of fish and fish products in benefit of producers and consumers; and to organize Baltic Region Quality Fish Forum steering group for planning, operative programs and follow up work.

Participants were fishery experts, representatives of the fish industries and trade, EU officials and national delegations of Baltic Sea Region member states. The participants came from Brussels, Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia and Sweden. In total fifty.

Grethe Hyldig (DIFRES) gave a key note speak entitled "Fish Quality and Standards" and was the chairman of the working group about fish quality standards and QIM was discussed in more detail.

There were great interest the QIM-work and it was concluded that QIM is importance for the Baltic region. The participants were very interested in QIM and QIM will be on the agenda for the next Baltic Region Quality Fish Forum.

European Sensory Network Seminar: Using sensory analysis in food product development and quality control 21-22 November 2002, Budapest, Hungary

The ESN seminar was attended by over 50 delegates from 15 different countries in addition to 20 speakers and representatives form member institutes of the European Sensory Network. The second day of the seminar consisted of concurrent, practical workshops sessions for key topics. The Lecture: Case study- Computerised sensory data sampling in the quality management and e-commerce of fish Presented by: Emilía Martinsdóttir, Icelandic Fisheries Laboratories

The presentations are shown in Appendix 4 and 5

2.3.11. Other meetings

FAIRFLOW-meeting, 25, Oct, 2002, Reykjavik, Iceland. Lecture: Harmonised sensory methods for evaluation of fish freshness in Europe

Presented by: Emilía Martinsdóttir, Icelandic Fisheries Laboratories. About 40 people attended this meeting. The presentations are shown in Appendix 6.

Poster at SEAFOODplus workshop at European Research 2002, Brussels 11-13 November 2002 a poster about the QIMCHAIN project was presented by Emilia Martinsdottir, Icelandic Fisheries Laboratories at the SEAFOODplus workshop

The poster is shown in Appendix 6

International Quality Retail Conference November 2002 held in Hamburg, Germany. A presentation was given by Joop Luten,.at RIVO.

The presentation by Joop Luten is shown in Appendix 7

European Sensory Network meeting attended by members of the network. ESN meeting in Reykjavik Lecture: Case study- Computerised sensory data sampling in the quality management and e-commerce of fish Presented by: Emilía Martinsdóttir, Icelandic Fisheries Laboratories

Presentation given by Emilia Martinsdottir is shown in Appendix 8

2 posters at the First Joint Trans-Atlantic Fisheries Technology Conference (TAFT)

33rd WEFTA Meeting and 48th Atlantic Fisheries Technology Conference

11-14 June 2003, Reykjavik - Iceland 2003

TAFT 2003 a poster about the QIMCHAIN project presented by Emilia Martinsdóttir, Icelandic (Appendix 6) and a poster on Consumer –QIM by Grethe Hyldig, DIFRES shown in Appendix 9

Schemes Quality Index method schemes are now presented at the web-page

2.3.12. Other activities:

Partner 1, IFL is using the QIM method in fish freshness evalaution in teaching and training in Fisheries training programme of the United Nations University.

Partner no. 2 RIVO has made a proposal to harmonise the training for new QIM-inspectors. This harmonisation is based on a 6 days program aiming to teach QIM to be used in practise for a fast and objective assessment of freshness of two relevant species, to people working in the fish industry.

Participant no.7 IPIMAR has disseminated QIM methodology, both in scientific papers and in Thesis prepared by students under the high school graduation or Master of Science Courses. They have made contacts with scientists and technicians from other institutes (namely Instituto del Frio, Spain), in order to harmonize the description of some attributes. They are now developing QIM schemes for some fish species currently marketed in Portugal.

Participant no. 5 NIFA has mentioned QIM as a useful tool for objective measurements of fish freshness in presentations for the industry. In three industry projects on quality of farmed cod NIFA has used QIM for freshness measurements. Industry partners that in this way were introduced to QIM were 10 cod farmers, and Norwegian Seafood Export Council.

2.4. Future actions

It was agreed that a representative form the QIMCHAIN project will be invited at the next annual meeting of the EAFPA, probably to be held during the seafood exhibition in Vigo, September 2003.

The next year of the QIMCHAIN project the network will be extended towards the south of Europe. Via the contacts of the EAFPA meeting in Vigo, interested French auctions will be visited similar to the tour in UK. There will be a follow-up in UK where other companies and auctions shown their interest will be visited.

3. PROGRESS REPORT OF WORKPACKAGE 2 – QIM WORKSHOPS

3.1. Objectives

The objectives of the QIM workshops are to demonstrate the effectiveness and user friendliness of the Quality Index Method to fish processors and users. Furthermore, the objective is to make the participants so familiar with the method that they can start to implement the method in their business. The aim is to involve the industrial key end users and share their practical experience of using QIM.

3.2. Description of work

The work in this work package is to organise and held 2. Based upon consultation of all partners in the project and any other relevant end-user the date, location and contents of two workshops on QIM must be decided. In these workshops at least 15-20 quality managers from actors from fish auctions and fish processors with no experience with QIM will be invited to participate to participate.

In the workshops, lectures and practical sessions with fish using the QIM method will be given. In the practical demonstration emphasis must be laid upon how QIM can be used and implemented in quality management or trade. The partners must learn how to train inspectors in using the method. Industrial key end-users of QIM have been established by the partners in the project. These key end-users must ally QIM, after an introduction by the partners, in their part of the chain on demonstration scale. Experiences from the demonstration scale must be presented at the workshops.

3.3. Results and deliverables

Several introductions to QIM have been given which can be regarded ass ‘mini-workshops’: UK and Ireland, Belgium and Iceland. Within these ‘mini’ workshops always a theoretical introduction has been given as well as a practical demonstration of QIM with fish. The UK-tour is described in chapter 2.

In Iceland four one-day courses in sensory evaluation on whole fish were organised by the Icelandic Fisheries Laboratories (IFL) and the Union of Fish Auctions for assessors from fish markets.
The main aim with the courses was to introduce a method to evaluate freshness of whole fish by the Quality Index Method (QIM). The courses covered lectures on sensory evaluation in general and sensory evaluation in the fish industry, shelf life and handling of catch and calculation and estimation of storage time. The participants received practical training using QIM to evaluate whole fish (cod, haddock, red fish and plaice) in a rapid and reliable way. The evaluation was harmonised and the results compared to storage time of the fish in ice. The participants in the courses rapidly adopted the Quality Index Method and became rapidly trained in using the method.

In most cases a high correlation was between the Quality Index and storage time in ice. Where the correlation was low, it could be explained by

various handling or temperature fluctuation of the catch, demonstrating the importance of good handling and cooling of the catch to obtain maximum shelf life.

During project year 1 there have been worked on having the first workshop. There has been worked with the following possibilities: Spain, the Baltic region, UK and France Discussion on the first workshops planned within the project has been discussed with the participant No. 7 and it was planned to hold the first one in Spain. AZTI has tried to find out the interest for such a workshop in Spain. It was decided to wait until after the Seafood Exhibition in Vigo, Spain in September to decide finally if it was possible to hold it in Spain. It was also decided to wait for the results of the UK-tour to decide if Britain would be a good choice for a workshop. Also France was discussed as a good choice (via EAFPA) and the targeted groups would be salmon buyers, producers. The French translation of the manual will however not be completed until February. Both the workshops will be held during the later year of the project. It has been found necessary to introduce QIM via tour to the industry before a real workshop could be held. After this first year the tour will go south. There are now 3 France and UK and Spain. The date, location and contents of two workshops on QIM will be decided at the project management meeting scheduled October 23. in Copenhagen.

All of the participants have been encouraged to contact the key-actors in their respective countries and all of them have made contact with them. The QIM for farmed salmon have been introduced to three smoke houses in Denmark and have been used in one of the smoke houses for a period of four weeks.

4.PROGRESS REPORT OF WORKPACKAGE 3 QIM-REFERENCE MANUAL

4.1. Objectives

The objective is to enhance the European dimension of research results on QIM for use in the European fish sector. The objective must be reached by developing practical guidelines and reference manuals. The guidelines and reference manuals must be in **all languages of the partner's countries**, for practical application of QIM in the fish sector to facilitate implementation of the QIM method and to improve general acceptance.

Information from the EU-project QimIT must be used (QIM-reference manual for at least 12 species in English) and existing information (already developed and proved QIM-schemes and photos) in each of the partners countries added and computerized.

4.2. Description of work

Even though it is stated in the objective it is not mentioned in the description of the work that the manual will also be translated into Icelandic, Dutch and Danish.

Translation of QIM-reference manual on at least 12 fish species will be done into Portuguese, Spanish, Norwegian and German. Translations will also be done in French, Italian. Translations to those 3 languages will be made by 3 subcontractors, one in France (IFREMER, Nantes, FR), one in Greece (Agricultural University of Athens, Athens, GR) and one in Italy (Dipartimento di Scienze zootecniche, Firenze, IT) .

Practical reference manuals and guidelines which must make the method workable, easy and rapid for assessment of fish samples in the fish sector using existing information will be printed in those languages. The guidelines and manual will contain information on for example: panel selection, panel training, sampling plan, assessments, facilities and examples of QIM-schemes and pictures. The existing software will be updated with QIM-schemes added and in all languages.

The text, tables for translation have been delivered to all of the participants and the subcontractors in word-format and excel-format. All have to deliver the translated text and tables back to Partner No 1 (coordinator). The software QUARK will be used for design and printing of the manuals.

The translations are finished into Danish and Dutch and they are now being printed. The Icelandic translation is finished but not printed. The Portuguese has also been delivered and software after ddiscussions with people from the Auction of Lisbon about some attributes and descriptors proposed in the English version of Reference Manual for the Fish Sector for a few species. Some of these items were translated taking into account the terms more often used in Portugal.

The Norwegian translation of the QIM Eurofish reference manual is nearly finished. All tables are translated and already sent in to Partner No 1 (coordinator). The text part of the manual will be finished in a couple of weeks. The Spanish versions are finished but have not been sent in.

4.2. Results and deliverables

All the translation will be delivered before the end of year 2003 except the translations from the subcontractors which will be delivered before February 2004.

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5. PROGRESS REPORT OF WORKPACKAGE 4-DISSEMINATION AT FISH EXHIBITIONS

5.1.Objectives

The aim is to inform the fish sector of the QIM-method and demonstrate the use of the method.

5.2. Description of work

Material for exhibitions and trade shows must be prepared, press conferences must be arranged and interviews in different media about the QIM methodology must be given. Efforts must be made to co-participate in booths with fish companies and auctions or participate in booths of the partners already established e.g.WEFTA (see also introduction to work plan for logos and reference of EC support). At the exhibitions practical demonstrations on how to use QIM must be given.

A list of relevant exhibitions to disseminate QIM has been made. All partners are encouraged to visit these exhibitions if appropriate. Dissemination materials to be used are selected: poster, handout, QIM-Eurofish brochure “QIM-your ideal tool for quality determination of fish freshness”, software demo.

Maritech (partner no. 8) is already participating in all major seafood exhibitions in Europe and will demonstrate the QIM software.

The following fish exhibitions are used for dissemination in the first year:

Seafood exhibition Brussels – 2002 presentation of QIM-Eurofish and proposal of QIMCHAIN project. 2003, QIM-software was presented at the booth of Maritech.

Partner 1 IFL and partner 9 Maritech at the Fisheries Exhibition in Reykjavik in September 2003

Presentation at Icelandic Fisheries Exhibition 4-6 Sept. 2002 by partner 1 and 8 IFL and Maritech.

The QIM-Eurofish brochure "QIM-your ideal tool for quality determination of fish freshness" was presented as a handout at the Maritech stand. QIM was also mentioned in other handouts, and how to use of the method was explained to interested visitors by IFL and Maritech personnel at the stand.

Glasgow United Kingdom in April 2003. Fishing Exhibitions for the Commercial Fishing Industry and Aquaculture International. QIM was presented by leaflets, no booth but RIVO people walking around

Polfish – Gdansk (Polland) , International Fair of Fish Processing and Products in May 2003. QIM was presented by poster and leaflets.

European Seafood Exposition and Seafood Processing Europe 2003 May 6-8th 2003, leaflets were presented at the booth of Maritech

RIVO has bought a handheld terminal and laptop with antenna system with the Wisefresh software (QIM software tool). This has been used for demonstration activities in UK and Ireland. Unfortunately the battery of the handheld terminal is not yet working properly and therefore 'fully remote' demonstration is not possible yet

5.3. Results and deliverables

The results of the demonstration of QIM at the named fish exhibitions are more awareness of QIM within the fish sector. The selected exhibitions represent the whole fisheries chain; Glasgow for fishermen and auctions, Seafood exhibition for processing and products. It also represents Europe;

North east Europe (Poland) as well as north-west Europe (Iceland) and middle Europe (Brussels) This awareness results in invitations for presentations about QIM at auctions, EAFPA meetings and the reference manuals. Information materials to be used at the exhibitions are posters, the QIM-Eurofish brochure "QIM-your ideal tool for quality determination of fish freshness" and demo version of the QIM software from Surefish.

5.4. Dissemination of research results

At the QIM-Eurofish website the exhibitions are listed, including the future activities on exhibitions.

5.5. Future actions

Participation is planned at following exhibitons :

Aquanor Trondheim (12/15-8-2003): presentation of QIM-Eurofish brochure.

VIGO (17/21-9-2003) presentation on QIM by Joop Luten. Participation of QIMCHAIN in the WEFTA booth.

Bremen (12/15-2-2004) Eventually WEFTA has a booth and QIMCHAIN can be presented like previous Bremen expo.

6. PROGRESS REPORT OF WORKPACKAGE 5 –QIM ARTICLES

6.1. Objectives

The aim is to introduce the Quality Index Method (QIM) and disseminate results on using QIM in the relevant parts of the European fishery chain to facilitate fish trade and improve quality assurance and production management. The aim is to publish articles in popular journals read by the fish sector, by fishermen, fish auctions, fish processors, retailers, distributors, and consumers as well as consumer groups to reach a widespread knowledge about QIM in the European fish and consumer group sector. In order to obtain this targeted dissemination intensive contacts will be made with consumer groups and journals thereof.

6.2. Description of work

The participants will write articles about QIM and the developments about QIM. These articles must be published in international industry oriented and popular journals. These articles must then be translated into the languages of all partners in the project and published in national fish trade journals. Also, partners and any other relevant end-user must be involved in the distribution of these articles into journals they are familiar with.

6.3. Results and deliverables

The partners 1, 2 and 3 have published 2 articles in the book Quality of Fish from Catch to Consumer:

E. Martinsdóttir J.B. Luten, Schelvis-Smit, A.A.M and Hyldig G. 2003. Scientific developments of QIM - past and future. Quality of Fish from Catch to Consumer. Eds. J.B. Luten, J. Oehlenschlåger,G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

Schelvis-Smit, A.A.M and J.B. Luten,. 2003. Catch Index: Developmen of a tool for measurement of the quality of the catch handling at sea. Quality of Fish from Catch to Consumer. Eds. J.B. Luten, J. Oehlenschlåger,G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

One article in a popular ‘meat’ journal has been published. Rian Schelvis. Kwaliteits Index Methode: De beste manier om de versheid van vis te bepalen. Vleesindustrie Januari 2003 (18-19).

How fresh is your fish? Emilía Martinsdóttir, Icelandic Fisheries Laboratories, Food Ingredients Sensorik, Newsletter, Behr´s Verlag Hamburg , Germany, October 2002.

Evaluation of fish quality at fish auctions in Iceland

Emilía Martinsdottir aand Bjarni Askelsson (Federation of fish auctions) Aegir 96, 4 2003 30 - 33

Furthermore, QIM is mentioned in several scientific articles when used as the reference method to assess fish freshness.

Participant no. 3 DIFRES have articles about QIM in preparation.

Partners 1, 2 and 3 will write a chapter in a book Sensory Evaluation in Muscle Food, scheduled for publication in 2004.

7. PROGRESS REPORT OF WORKPACKAGE 6 –QIM WEB-SITE

7.1. Objectives

The objective is to introduce the Quality Index Method (QIM), stimulate implementation and disseminate results on using QIM in the relevant parts of the European fishery chain via a QIM web site on the internet.

The web-site must be an active forum for the QIM partners and other relevant stake holders,

The web-site must have detailed information on QIM covering the schemes for the different species and various languages.

The web-site must also be used for dissemination of this accompanying measure aims, progress and relevant results

7.2. Description of work

A web-site that offers information to all interested parties about QIM and status and possibilities of using QIM have been created and maintained by partner 2 from the beginning of the project and contains information about the project, its status, progress and other relevant information. The existing schemes in English and photos are now published on the web-site

This information have been be integrated in the website of QIM Eurofish. All consortium members have made contributions to maintain the relevant information up to date available.

A new stats system has been deployed by the hosting provider, and data from before august 2003 is purged. I September 2003: 117 unique visitors/month, 218 visits/month looking at 1658 web pages, 10 visits/day*. From September 2003 incremental counting is available.

Unique Visitor is a unique visitor is a host that has made at least 1 hit on 1 page of your web site during the current period shown by the report. If this host make several visits during this period, it is counted only once.

7.3. Results and deliverables

Dissemination of all actibiites of the project on the web-site

7.4. Future actions The website must be maintained after the lifetime of the accompanying measure by the QIM Eurofish alliance.

The feasibility of the use of streaming video technology at the website for giving information about QIM will be evaluated. This upcoming technique may enhance the effect of transferring knowledge to the users in the chain

Web-site is used as an active platform for the network. Widespread knowledge about QIM in the fish sector, authorities and the scientific community

8. PROJECT MANAGEMENT

Icelandic Fisheries Laboratories, IFL, is carrying out the project co-ordination. The co-ordinator of the project is responsible for the overall management of the project and is the central contact person for all communications. The co-ordinator of this project provides the Commission with an annual progress report and cost statements. Partners from QIM Eurofish alliance are responsible the work-packages. For an effective management a management team have been formed consisting of Emilía Martinsdóttir, the coordinator, Joop Luten and Rian Schelvis-Smit, RIVO and Grethe Hyldig, DIFRES. The management team has met 2 times during the first year. The daily communications between the plenary meetings have been via e-mail networks. A common meeting of all partners in the accompanying measure was held in June 2003. and another one will be held. The minutes of the meetings are in Appendix 10.

Annually the co-ordinator provides the Commission with a progress report consisting of the progress reports from the partners and an administrative report. The partners have to keep record of individual time and expenses and provide the co-ordinator with this information.

9. PUBLICATIONS

Rf-Report Sensory Evaluation of Fish Freshness by QIM-method. Emilia Martinsdottir, Kolbrún Sveinsdóttir, Ása Thorkelsdóttir and Bjarni Áskelsson Icelandic union of Fish Auctions

Rian Schelvis. Kwaliteits Index Methode: De beste manier om de versheid van vis te bepalen. Vleesindustrie Januari 2003 (18-19).

Emilía Martinsdóttir, Icelandic Fisheries Laboratories, How fresh is your fish? , Food Ingredients Sensorik, Newsletter, Behr´s Verlag Hamburg , Germany, October 2002

Emilía Martinsdottir and Bjarni Askelsson (Federation of fish auctions). Evaluation of fish quality at fish auctions in Iceland . Aegir 96, 4 2003 30 – 33

E. Martinsdóttir J.B. Luten, Schelvis-Smit, A.A.M and Hyldig G. 2003. Scientific developments of QIM - past and future. Quality of Fish from Catch to Consumer. Eds. J.B. Luten, J. Oehlenschlåger,G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

Schelvis-Smit, A.A.M and J.B. Luten,. 2003. Catch Index: Developmen of a tool for measurement of the quality of the catch handling at sea. Quality of Fish from Catch to Consumer. Eds. J.B. Luten, J. Oehlenschlåger,G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

10. APPENDICES

Appendix 1. Presentation given by Rian Schelvis-Smit in UK

Appendix 2. Slides from the presentation of Joop Luten 4 at EAPPA meeting

Appendix 3. Presentation by Grethe Hyldig in Pori,Finland

Appendix 4. Presentation by Emilia Martinsdóttir in Budapest

Appendix 5. Presentation given by Emilia Martinsdottirat FAIR-FLOW meeting

Appendix 6. Poster on QIMCHAIN – project

Appendix 7. A presentation by Joop** Luten at **International Quality Retail Conference November 2002

Appendix 8. Poster on Consumer –QIM by Grethe Hyldig, DIFRES

Appendix 9. Example of manual translations

Appendix 10. Minutes of project meetings and project management meetings

Quality Index Method
QIM
to assess fish freshness

Rian Schelvis

Netherlands Institute for Fisheries Research (RIVO), The Netherlands

Outline

- Importance to control fish freshness
- Principles of Quality Index Method (QIM)
- How to implement QIM
- QIM products
- QIM prospects

Dutch consumer organization 1999

Kabeljauw

met een ammoniakluchtje

Supermarkt levert vaak rotte vis

Als u op een lekkere verse kabeljauw uit bent, kunt u het ...t naar een goede viswinke... ...am gaan. De nieuwe, zuurstofarm verpakte vis uit de supermarkt is geen succes. Vaak krijgt u rotte vis.

De test: wat en hoe

We hebben kabeljauwfilet gekocht in supermarkten, in viswinkels en bij marktkramen. Een speciaal getraind panel van visproevers heeft beoordeeld of de vis vers van smaak was. Visdeskundigen hebben een oordeel geveld over de fileerkwaliteit. De bacteriologische staat van de vis is vastgesteld in het laboratorium. Het Testoordeel kon niet hoger uitvallen dan het oordeel voor smaak; en bij een *matig* of *slecht* oordeel voor bacteriën niet hoger dan dit.

Cod with ammonium smell

Supermarket sells rotten fish

Dutch Fisheries Magazine 2001

VRIJDAG 29 JUNI 2001 PAGINA 5

Kwaliteit gemeenschappelijk vriend en vijand in keten

Fijnere kwaliteitsindeling verse vis in afslag gewenst

IJMUIDEN – Alle schakels in de keten hebben een gemeenschappelijke vijand: slechte kwaliteit. Kwaliteit moet ondubbelzinnig zijn te meten, ook voor kopers op afstand. De informatie vanaf zee richting de kopers moet beter, zodat die snel genoeg weten welke kwantiteit en kwaliteit er aan komt voor de veiling. Doordat het leeuwendeel van de aanvoer van verse vis in Nederland categorie A is, is een nadere indeling in kwaliteitsklassen gewenst. Ook kan gedacht worden aan een 'borgingsstelsel' voor de kwaliteit van aanvoerders, net als bij de bloemenveilingen. Dat waren enkele uitspraken gedaan op de speciale themadag over kwaliteit van het Productschap Vis afgelopen zaterdag in IJmuiden.

De presentatie van de CD-rom 'Kwaliteitsverloop Rondvis', een pleidooi voor een fijnmaziger kwaliteitsindeling van verse vis, een kijkje in de keuken van de verenigde bloemenveilingen van Nederland en de uitreiking van de Productschapsprijzen van verse vis. Zo zag het programma eruit van de studieochtend 'Kwaliteit, een keten kwestie', die afgelopen zaterdag in het Thalia Theater werd gehouden. De bijeenkomst onderscheidde zich door de goede organisatie, en de zonder uitzondering goede en 'prettige' sprekers.

De ochtend begon met de presentatie van een CD-rom over het kwaliteitsverloop van rondvis door de hele keten door Maarten Mens, hoofd van de afdeling Handel van het PV. De CD-rom is een product van het Van Hall Instituut en gemaakt in opdracht van het PV in het kader van het project Kwaliteit. Doel van het programma is om inzicht te geven in wat er allemaal gebeurt met de vis in de keten van vangst tot en met consument, en wat de invloed daarvan is op de kwaliteit en dus de houdbaarheid. Het mooie van de CD is dat de invloed van de verschillende handelingen op de houdbaarheid kan worden gesimuleerd, door de invoer van eigen data en veronderstellingen. Hoe wordt de houdbaarheid beïnvloed als er anders wordt gewassen aan boord? Wat gebeurt er als we de rondvis MAB (met gemodificeerde atmosfeer) verpakken? Hoeveel langer is de vis houdbaar als we de temperatuur van de vitrine in de supermarkt lager instellen? Mens ging live met de CD aan de slag en liet zien dat het programma de houdbaarheid na aankoop steeds uitrekent. De zaal kon de presentatie zeker wel waarderen en zag ook het nut in van de CD-rom. Wel moet de consument erop worden gewezen dat deze goed omgaat met het aangekochte visproduct. Anders

is alle moeite die [illegible] vooral is gedaan voor niets geweest.

Guus Pastoor, adjunct-secretaris van het PV, toonde aan dat het met de kwaliteit van de aangevoerde verse vis in Nederland wel goed zit. Er wordt nauwelijks vis afgekeurd. En de mindere klasse B maakte vorig jaar op Urk bij de tong 0,02 procent van de aanvoer uit, bij de schol 0,15 procent, 0,77 procent bij de kabeljauw en maar 6,56 procent bij bot. In totaal ging het om 117.678 kilo B-kwaliteit op een totaal van 39.950.198 kilo (0,29 procent). Er is een kleine categorie E (zeer goed). Keerzijde van de kleine percentages is dat vrijwel alle vis in categorie A terecht komt, terwijl binnen deze categorie volgens Pastoor nog veel verschillen zitten.

Pastoor pleitte ervoor om met behulp van de Kwaliteits Index Methode (KIM) een fijnere indeling te maken, waarbij in ieder geval A zou moeten worden verdeeld in A+ en A-. De KIM geeft strafpunten. Geen strafpunten wordt dan E, 24 strafpunten automatisch afkeur. De KIM sluit volgens Pastoor goed aan bij wat keurmeesters toch al doen.

★ Afslagdir[illegible] leur Hollingsworth aan de visafslag.

In tegenstelling tot bloemen en planten [illegible] een aanbodmarkt. F.N. Hollinger, directeur van de Bloemenveiling Oost-Nederland, hield een vermakelijk betoog over kwaliteit van de aanvoer en hoe de Nederlandse bloemenveilingen hiermee omgaan. Tegen de siertelersector wordt door de Nederlandse vissector wel opgekeken. Gezien de omzetcijfers wekt dat geen verwondering. De Nederlandse bloemenveilingen hebben bij elkaar een jaaromzet van tegen de f.9 miljard gulden, wat 35 procent is van wat er in de EU als geheel omgaat. Voor f.1 miljard wordt geïmporteerd uit landen als Kenia en Israël. Voor de siertelers in Nederland geldt een veilplicht. Kopen op afstand maakt momenteel [illegible] kwekers, die in de toekomst ook gepubliceerd gaat worden! De aanvoerders aan de veilingen moeten zelf hun handtekeningen zetten onder een verklaring dat hun kwaliteit in orde is. „Aanvoerders die onbetrouwbaar blijken worden veel gekeurd en moeten die keuringen zelf betalen. Betrouwbare aanvoerders worden minder vaak gekeurd en zijn dus goedkoper uit." Bij de veilingen vinden regelmatig gerichte keuracties plaats, die ook aangekondigd worden. Er wordt hard gewerkt aan de borging van kwaliteit, door middel van certificering van alle schakels in de keten, inclusief de detailhandel.

Auction demands detailed quality classes

Quality assessment fish

- Sensory analyses best method to assess fish freshness
  - with aid of human senses (nose, eyes, mouth, fingers)
  - all in one: measure, analyze and interpret information
  - used in: - scientific research (comparison with chemical or microbiological analyses)
    - product development
    - shelf life research
    - quality control
  - has proven its use in practical situations

Quality assessment fish

- Torry schemes for fish (Shewan et al, 1953)
  - cooked fillets
  - quality control and food safety
- EU regulation (E(xtra), A, B, rejected) (CR, 2406/1996)
  - fresh (gutted) whole fish
  - basic framework for quality grading, food safety
- Quality Index Method (Bremner 1985)
  - freshness fresh (gutted) whole fish
  - quality grading, quality control and food safety

Principles Quality Index Method

- Well described attributes per fish species
- Changes in freshness during storage in ice
- Score 0 to 3 index points for each attribute:
  - outer appearance (eyes, skin, gills)
  - smell
  - texture
- Summation of all index points: Quality Index
- Linear relationship QIM score and storage time in ice

QIM scheme for salmon

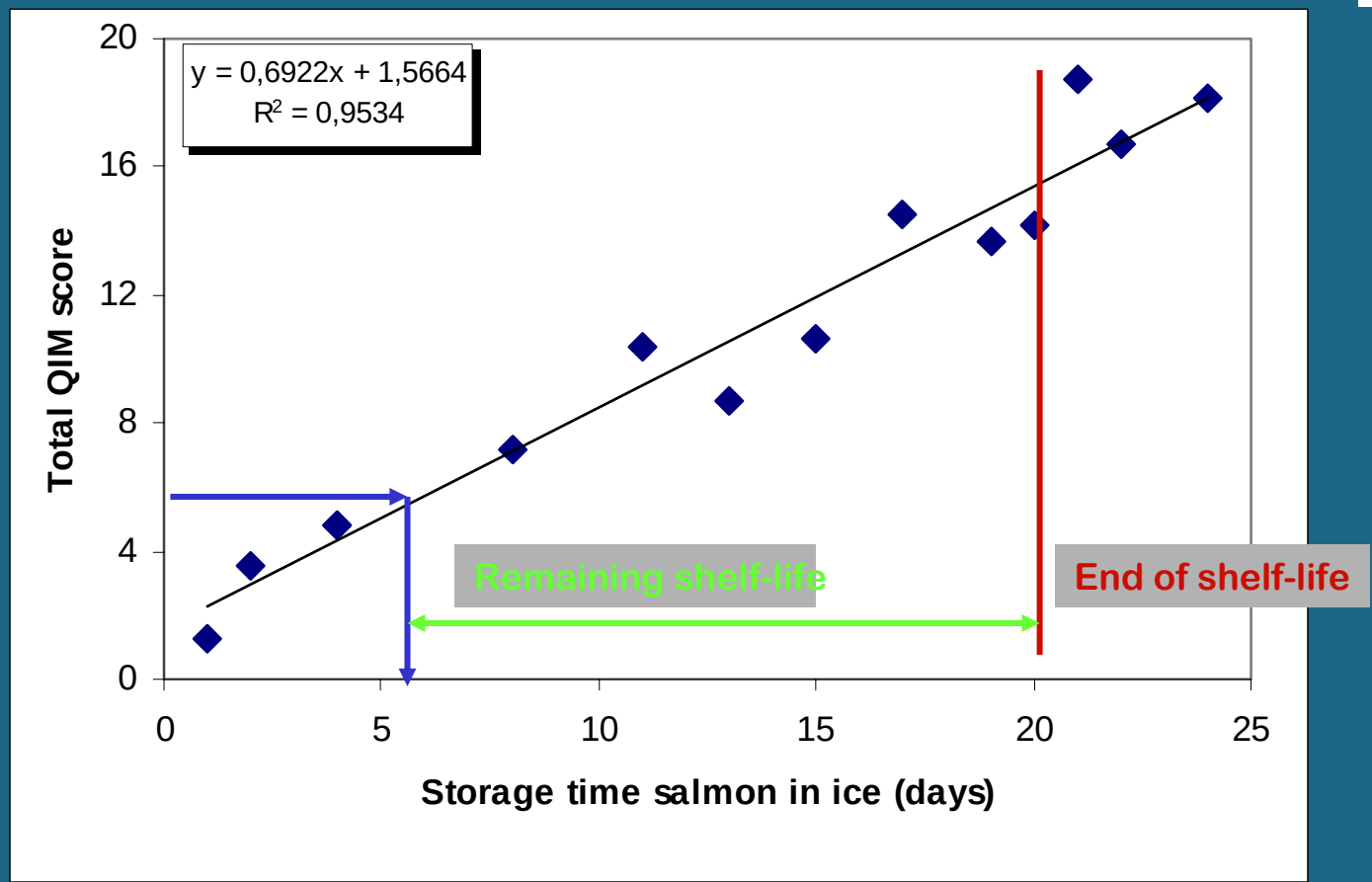
Quality parameter		Description	Score
Skin	Colour/ appearance	Pearl-shiny all over the skin	0
		The skin is less pearl-shiny	1
		The fish is yellowish, mainly near the abdomen	2
	Mucus	Clear, not clotted	0
		Milky, clotted	1
		Yellow and clotted	2
	Odour	Fresh seaweedy, nutral	0
		Cucumber, metal, hay	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
		Mat, 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

Quality parameter		Description	Score
Skin	Colour/ appearan	Pearl-shiny all over the skin	0
		The skin is less pearl-shiny	1
		The fish is yellowish, mainly nea	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

Development of a QIM scheme

- Standardised controlled storage experiments
  - fish as fresh as possible
  - onboard processing under GMP
    - good gutting, good washing, fast reduction in temperature, storage in melting ice, sufficient clean ice in the boxes, not overloading the boxes.
  - controlled storage in melting ice
  - every day sensory evaluation by QIM-experts
  - detailed descriptions of all attributes changing during storage
  - statistical analyses to obtain linear relation between the QIM -score and storage time in ice
  - verification of calibration curve

QIM calibration curve for salmon



Advantages QIM

- Description precise and objective
- No rejection of samples based on one single criterion
  - No due emphasis is laid upon one single attribute.
- Robust scoring system
  - minor differences in judgements in any criterion being assessed do not unduly influence the total score
- Estimation end of shelf life
- Easy to learn

QIM training

- QIM-Eurofish training: European harmonisation of methodology to assess fish freshness
- The aims of the QIM training:
  - to use QIM to assess fast, accurate and reliable the freshness of fish
  - to use QIM in daily practise
  - to get general knowledge on the spoilage pattern of fish
  - to get general knowledge on the factors influencing fish quality
  - interpretation of test results
  - introduction of WISEFRESH software

Training

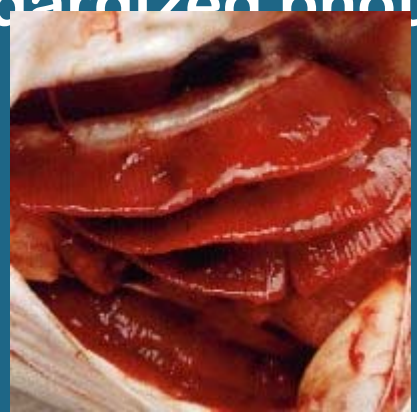
- Selection candidates
  - Attitude towards quality
  - Odor identification test
  - Color deficiency test
- 6 intensive training days for 2 selected species
- “Hands on” practice
- Theory combined with practice
  - Sensory evaluation in general
  - QIM principles
  - Practical implication of QIM in the company
- Examination
- Certificate valid for 2 years
- Regular retraining

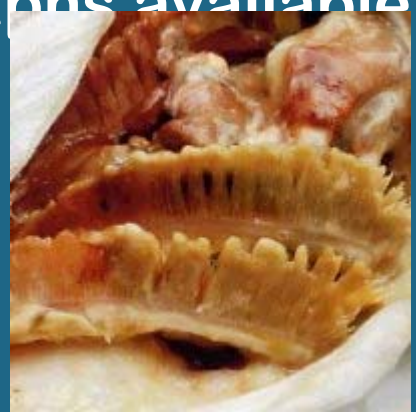
QIM procedures

- Use a strict protocol
  - define the batch
  - describe the batch (traceability)
  - individually assess one fish at the time
  - compare the attributes with the description on the scheme
  - work trough all attributes on the scheme
  - add all scores to get the total QIM score
  - assess at least five fishes per batch and average them
  - examine other quality aspects

QIM products

- QIM schemes and calibration curves for important European fish species
  - plaice, turbot, sole, brill, dab, cod, haddock, red fish, Pollock, farmed salmon, deep water shrimps, herring, Norwegian lobster
- Standardized photographs available of gills, skin, eyes





Handheld (remote) system

- Wisefresh (software package QIM) with handheld instrumentation

QIM versus EU standards

- Current quality grading at (Dutch) fish auctions
  - all fish has A quality
  - need for more differentiation in quality classes (E, A+, A, A- and B)
- Linking of QIM scores to EU grading system (plaice)

QIM score	EU grade
0 - max 5	E
> 5 - max 9	A +
> 9 – max 13	A
>13 – max 16	A -
>16 – max 21	B
>21	Rejected

QIM Prospective

QIM in action

Outcome Concerted Action ‘Fish Quality Labelling and Monitoring’ (CA-FQLM) and role auctions (EAFPA)

Joop Luten

Head Department Seafood and Aquaculture

Netherlands Institute for Fisheries Research (RIVO), The Netherlands

Projectmanager

QIM® EUROFISH

RIVO

WAGENINGEN UR

Outline contribution

- Objectives and outcome Concerted Action 'Fish Quality Labelling and Monitoring'
- Short introduction to QIM
- Questions EAFPA about CA-FQLM
  - What are the regulations on traceability?
  - Where do we stand on quality schemes?
  - What is going to be the role of the auctions?
  - What is the follow up of these studies (recommendations, national law, EU regulations)?
- Short TV broadcasted video about implementation QIM in auction Scheveningen

Primary objectives CA-FQLM

- To stimulate a common opinion about quality labelling, define quality labelling as a general term and to define specific labels
  - To achieve this, the views of different parts in the fish processing chain (fishermen, port markets (auctions), processors, wholesalers, retailers), scientist and consumers will be taken into account
- To establish common views on the relevant factors that constitute fish quality in labelling schemes, including GMP and fish freshness
- To further develop, extend and implement the sensory method for fish freshness measurements, particularly the quality index method (QIM) as the reference method

Outcome CA-FQLM – Technical facts (November 1998 – May 2002)

- Core participants
  - 14 European fish research institutes, five European fish sector organisations, six food quality labelling experts
- Meetings
  - Three plenary meetings (Noorwijkerhout (1998), Bilbao (1999) and Firenze (2002)).
    - Number of participants 45-120.
    - 30% from industry
  - Two workshops in 2001 about 'Quality labelling and GMP on board' and 'Quality labels for retailers and consumers'
  - Two training workshops about QIM, Scientist (2000) and Quality managers salmon sector (2001)
- Book 'Quality of Fish from Catch to Consumer: Labelling, Monitoring and Traceability', March 2003

Outcome CA-FQLM

- There are many perceived needs in the fishery chain, based upon questionnaires among partners in the fishery chain in Europe with respect to information.
  - Freshness (expressed as storage days in ice or day of the catch or best before date) is for all partners in the chain (including consumers) the KEY element to be implemented in a quality label
- QIM is widely accepted reference method in research for measuring fish freshness and implementation in the European fishery chain is progressing due to driving forces like e-commerce and need for differentiating in grading.
  - Software tools, training facilities and a user-network to facilitate the implementation of QIM are rather well established in Europe and will be expanded in the future by the strategic alliance QIM Eurofish
- Several European examples show that quality (freshness) pays off. Introduction of quality standards based upon QIM approach may contribute to a technical quality system with (financial) benefits and fulfill demands of the market (differentiation in EU grading and e-commerce)

Short introduction to QIM and quality assessment fish

- Sensory analysis is most common method
- Torry schemes for fish (Shewan et al, 1953)
- Common marketing standards (Council Regulation, 2406/1996)
  - meant to be a basic framework for quality grading
  - E(xtra), A, B
- Quality Index Method
  - developed in 1985 by Allan Bremner (Tasmanian Food Research Unit)

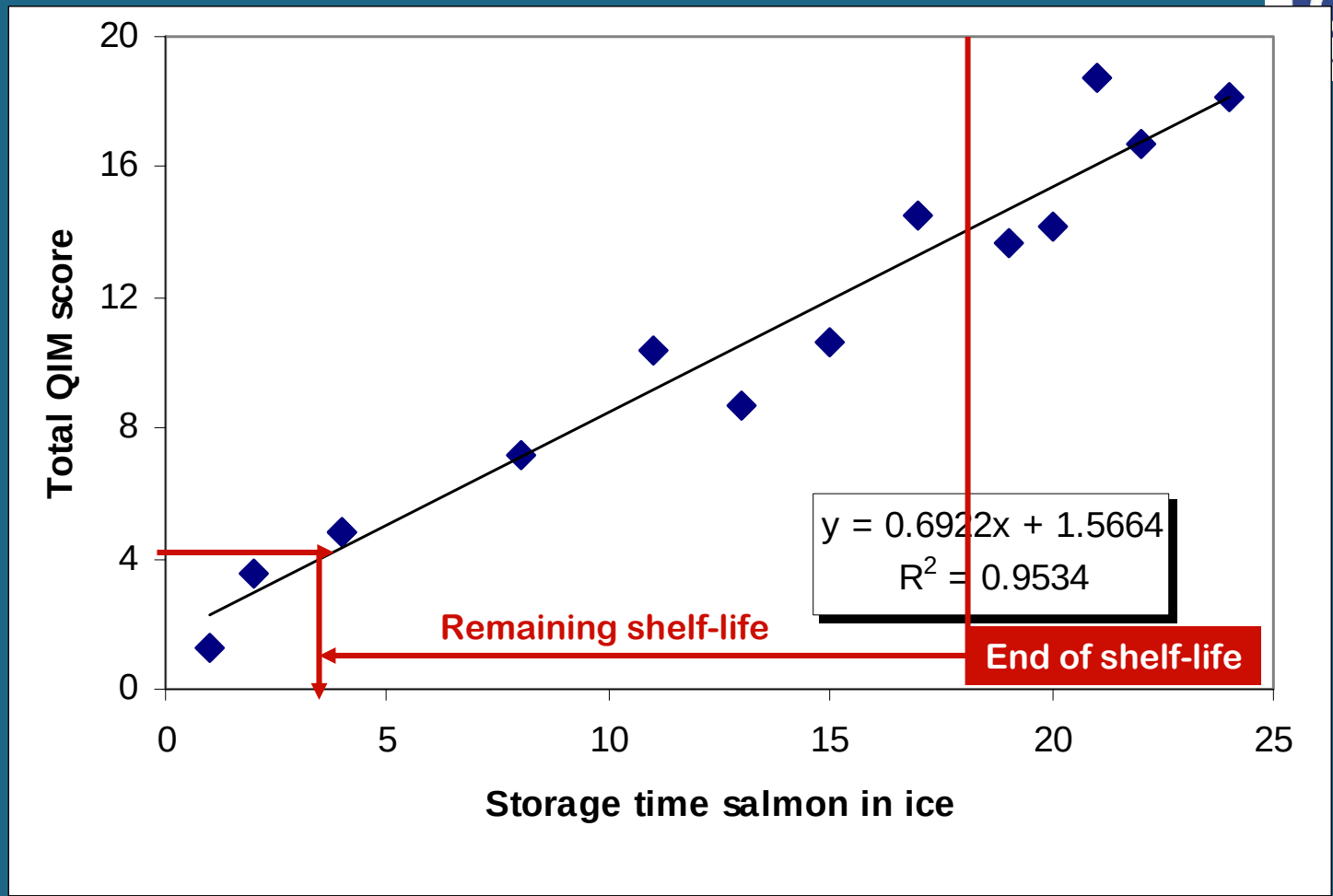
Principles Quality Index Method

- A score from 0 to max 3 demerit (index) points is given for changes in:
  - outer appearance (eyes, skin, gills)
  - smell
  - texture
- On basis of well described QIM scheme for the fishspecies
- Scores of all characteristic are summarised to give an overall (total) score
- There is a linear relationship between total QIM score and storage time of the fish in ice

QIM scheme (partly) for salmon

Freshness quality parameters		Description	QIM 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, neutral	0
		Cucumber, metal, hey	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
		Mat, grey	2
	Form	Convex	0
		Flat	1
		Sunken	2
Gills	Colour	Red/dark brown	0

QIM calibration curve for salmon



Advantages QIM

- No due emphasis is laid upon one single attribute. A sample can not be rejected on the basis of one single criterion
- Minor differences in judgements in any criterion being assessed do not unduly influence the total score
- Description of grades is precise and objective
- Total number of index points can also be used to estimate end of shelf life

Questions EAFPA about CA-FQLM

- Where do we stand on quality schemes?
- What is going to be the role of the auctions?
- What is the follow up of these studies (recommendations, national law, EU regulations)?

Where do we stand on quality schemes?

- EU grading system, how does it work in practice?
  - QIM as new objective fast tool to fulfill demands of market for differentiation in quality classes
  - QIM as new objective fast tool to fulfill demands of e-commerce

What is going to be the role of the auctions?

EAFPA objectives

The daily dialogue between fish buyers and producers at auctions, contributes to the setting of fair prices for fish.

⚓ **Recognition for the role of fish auctions**

- To recognize auctions as the first marketeers of fresh fish.
- To promote appropriate regulatory proposals.
- To integrate the benefits of auctions in European legislation.
- To engage in and maintain a constructive dialogue with the European institutions (Commission, Council, European Parliament).
- Participate in the EU Advisory Committee for fisheries.

⚓ **Standardisation**

- Definition of quality standards for products amongst auctions.
- Strict hygiene regulation and control.
- Development of best practice between auctions.
- Integration of standards in European legislation.
- Generalisation of product traceability.

⚓ **Development of an Information System for auctions**

What is going to be the role of the auctions?

Public obligatio	b) Nevertheless everybody seems to take their services for granted : access to information and meeting rooms for various purposes, employment of dockers and provision and renting of premises.	Harmonisation at a European level is vital in order to ensure coherence. This legal vacuum needs to be filled as soon as possible. Auctions can not be expected to undertake public services without due recompense.
Assistance/ training	a) Our profession is a complex one, which requires high technology and a high level of automation. b) Skilled personnel are a necessity. Auctions train their personnel and provide assistance for professional middlemen in their relations with the public authorities.	No legal text is available on the issue. This situation should be remedied. An adequate status for personnel as well as support for training is required. Minimum requirements on these issues should be developed at the European level.

Initiatives taken so far by auctions in Europe

- In Belgium (Flamish United Fish Auctions (Zeebrugge, Oostende and Nieuwkoop)), the Netherlands (United Fish Auctions (Stellendam, Scheveningen, Colijnsplaat)) and Iceland about 50 employees have been selected and trained for QIM
  - interview candidates (attitude)
  - odor identification test (approx 30 odors) and color blindness test
  - QIM principle
  - 6-8 intensive training days for 1-2 selected species according learning by doing principle
  - “examen” by assessing fish of (un)known quality
  - certificate valid for limited period
  - retraining with 1-2 year

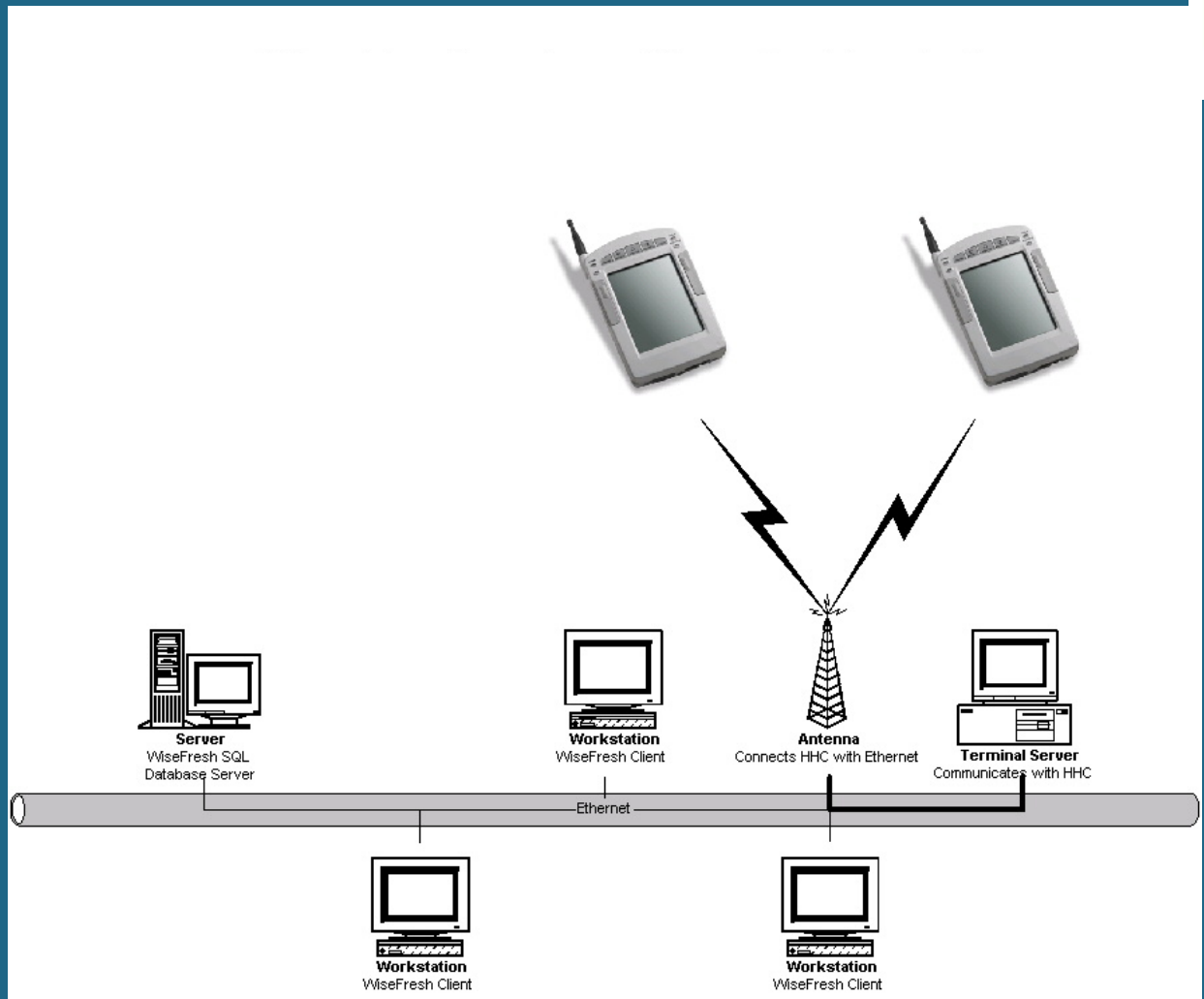
Software

- Software developed for QIM assessment
  - in English, Icelandic, Dutch and Danish
  - training modules
- QIM schemes and calibration curves for important European fish species
  - plaice, turbot, sole, brill, dab, cod, haddock, red fish, pollock, (farmed) salmon, 3 types of shrimps, herring, Norwegian lobster
  - available on web www.qim-eurofish.com
  - standardised photographs available of gills, skin, eyes
- QIM manual available (QIM-Eurofish)
  - in English
  - in 8 other European languages in period 2003-2004

System (at United Fish Auctions, NL)

- Wisefresh (software package QIM) with handheld instrumentation in implementation phase

Wisefresh setup of handheld solution



What is the follow up of these studies (recommendations, national law, EU regulations)?

- Approx. 10 new QIM schemes to be developed in Belgium (2003-2004)
- EU QIMchain project
  - QIM promotion tour in United Kingdom and Ireland (June 2003)
  - Extension QIM network
  - Training workshops for industry
- QIM in Marrocco
  - FAO project for QIM Eurofish (2003)
- QIMscan in the Netherlands
  - Initiative Dutch Board for Fisheries, NOVA and Fishermen organisation (2003)
- Developing Product(filet)-QIM and Consumer-QIM
- Further development CatchIndex concept
  - QIM as control check point

Thank you for your attention

Danmarks Fiskeriundersøgelser
Afdeling for Fiskeindustriel Forskning

QIM®
EUROFISH

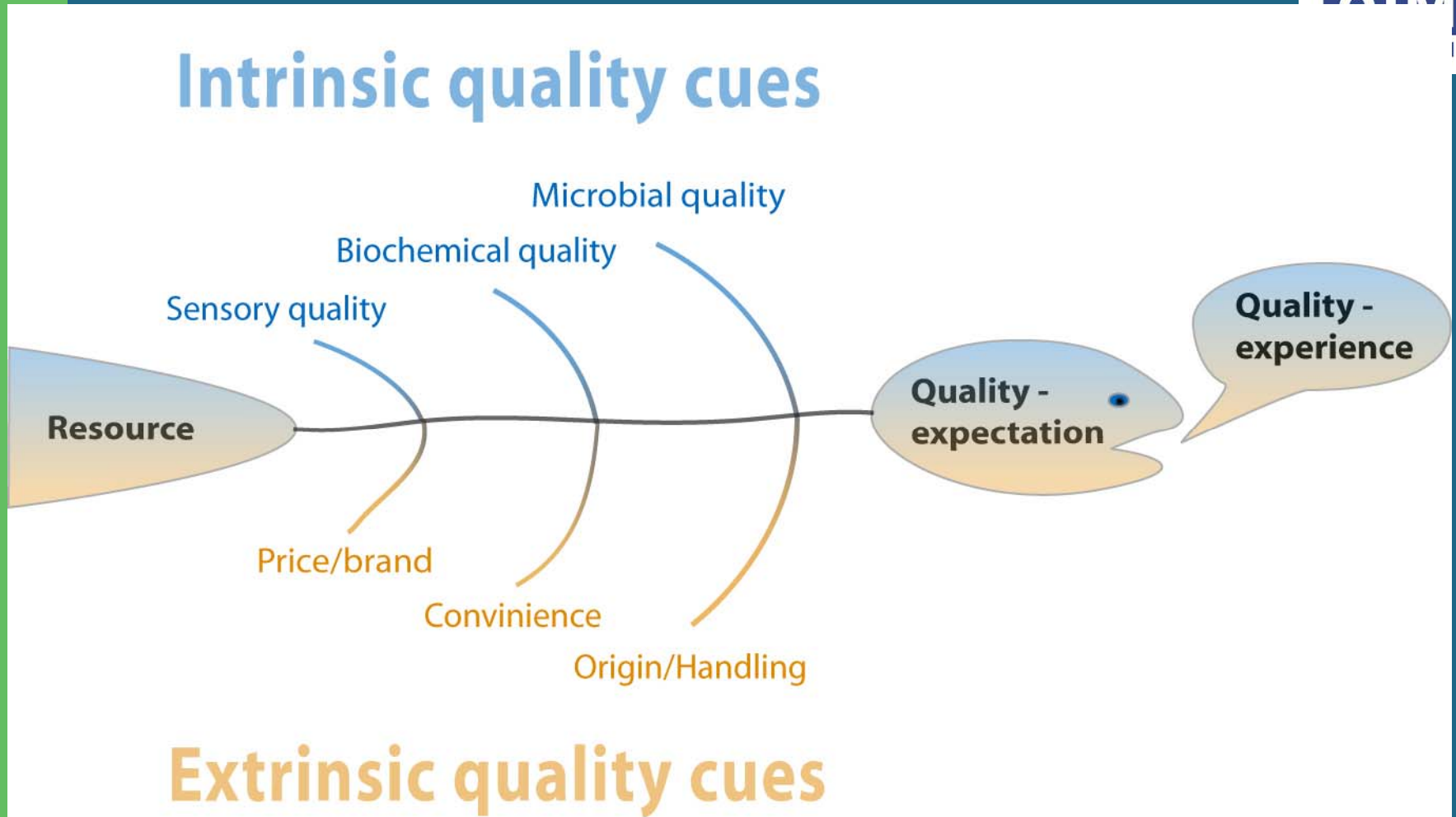
Sensory a tool for measuring freshness and eating quality in the classification of fish

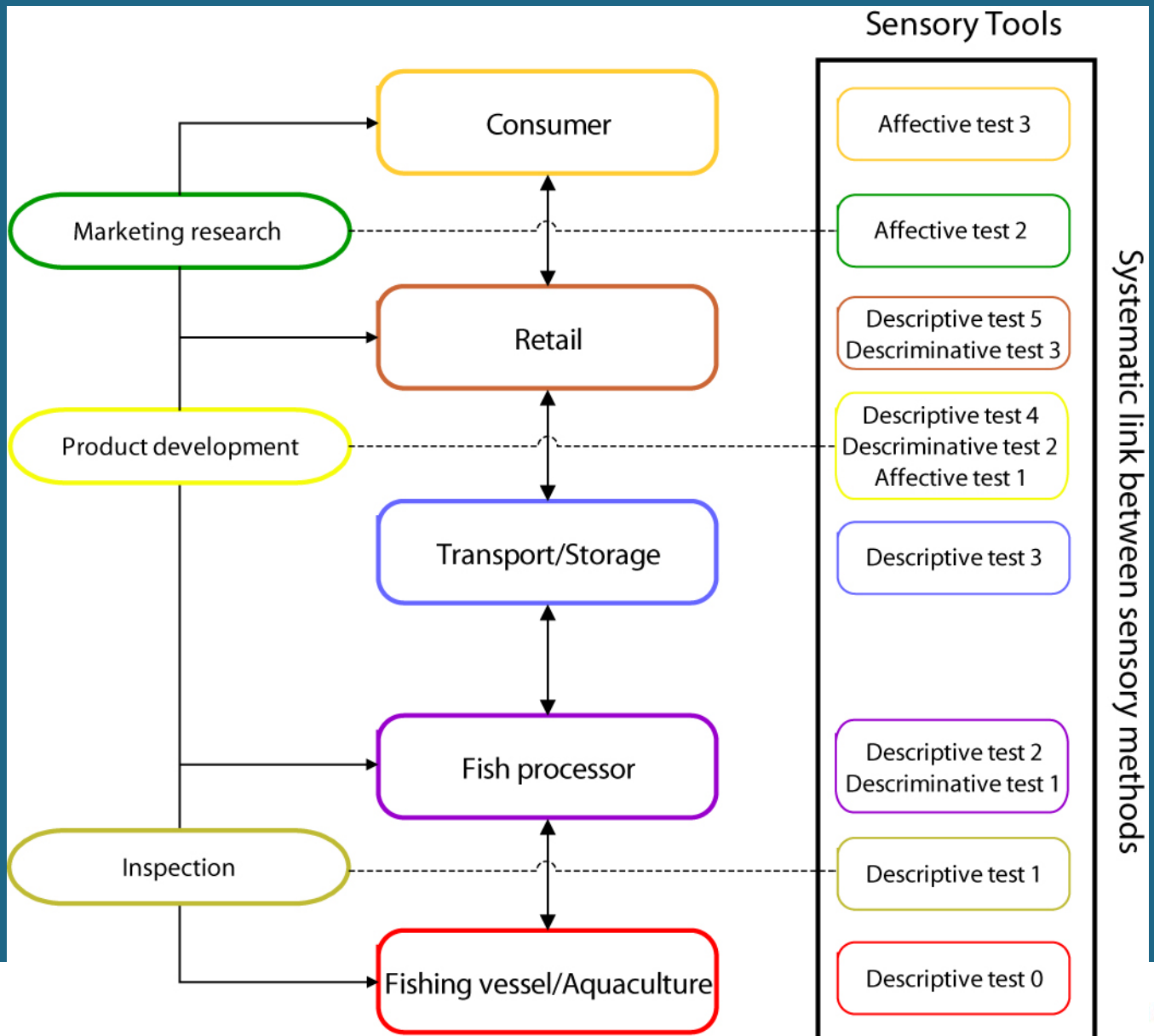
Grethe Hyldig

Fish quality standards

- What is Quality?
- Why is quality important?
- The quality chain
- Sensory test methods for quality
- Eating Quality


Perception
Product
Perceived quality cues
Person
Place


Intrinsic quality cues
Microbial quality
Biochemical quality
Sensory quality
Resource
Quality - expectation
Quality - experience
Price/brand
Convinience
Origin/Handling
Extrinsic quality cues


Sensory Tools
Consumer
Marketing research
Retail
Product development
Transport/Storage
Fish processor
Inspection
Fishing vessel/Aquaculture
Affective test 3
Affective test 2
Descriptive test 5
Descriminative test 3
Descriptive test 4
Descriminative test 2
Affective test 1
Descriptive test 3
Descriptive test 2
Descriminative test 1
Descriptive test 1
Descriptive test 0
Systematic link between sensory methods

SENSORY

INPUT - STIMULUS

Attention

Sensory registration

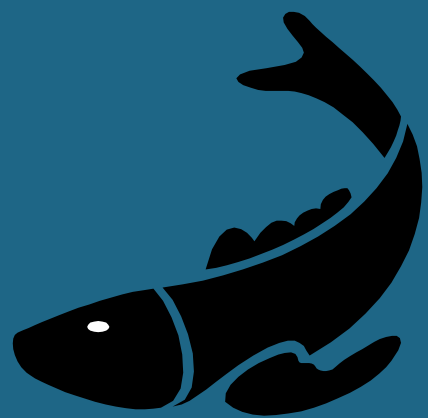
ADAPTATION

Perception/Recognition

Awareness/Memory

Decision/Language

OUTPUT - RESPONS



Objective

Does the difference mean anything to the consumer?

CONSUMER TEST
Affective and cognitive test

How is the product different?

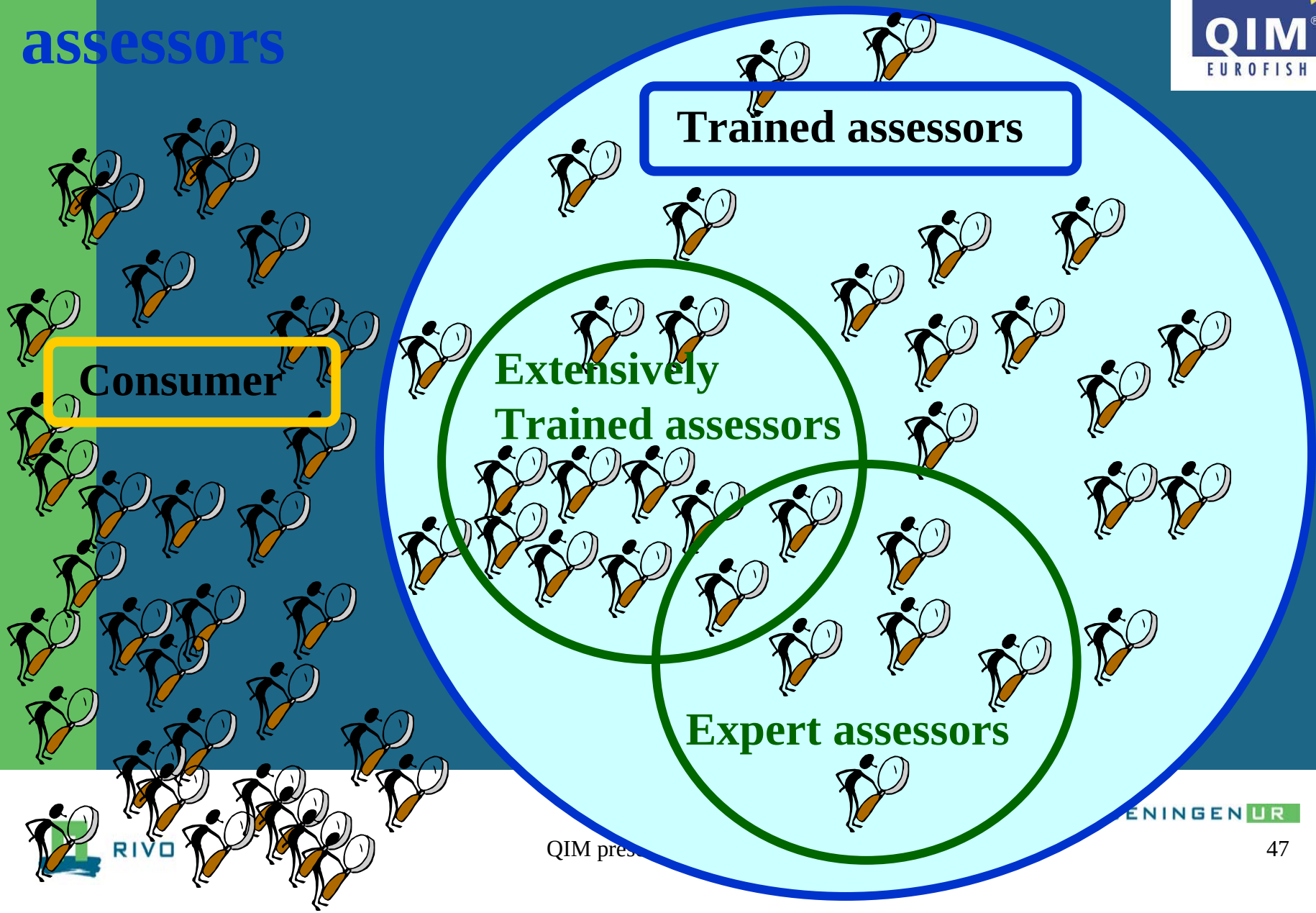
DESKRIPTIVE TEST
QUALITY TEST

Is the product different?

DISKRIMINATIVE TEST

Subjective

Sensory assessors



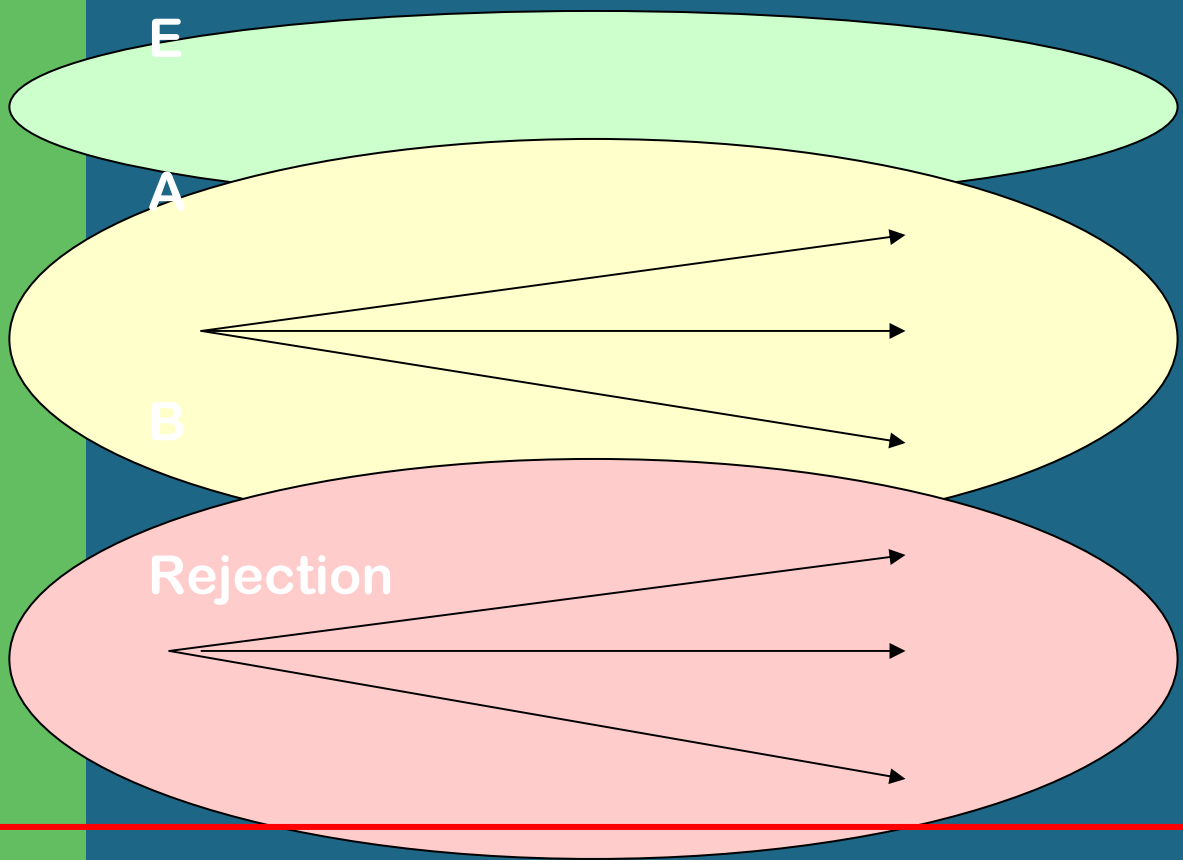
Freshness ratings: Council Regulation (EEC) No. 103/76 OJ No. L2

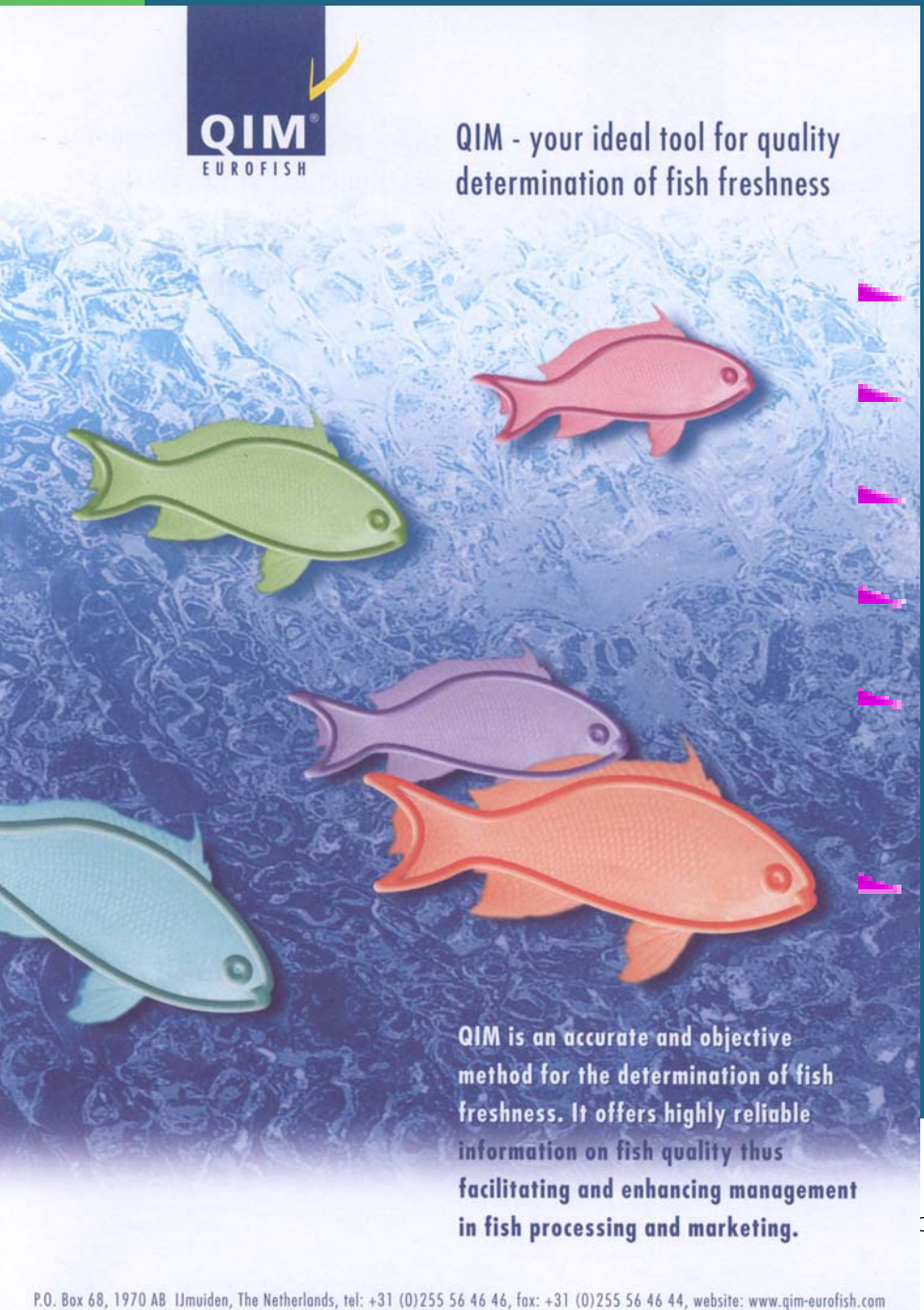
		E	A	B	
Appearance	Skin	Bright, iridescent pigmentation, no discoloration Aqueous, transparent, mucus	Pigmentation bright but not lustrous Slightly cloudy mucus	Pigmentation in the process of becoming discoloured and dull Milky mucus	Opaq
	Eye	Convex (bulging) Transparent cornea Black, bright pupil	Convex and slightly sunken Slightly opalescent cornea Black, dull pupil	Flat Opalescent cornea Opaque pupil	[1]Concave in the centre Milky cornea Grey pupil
	Gills	Bright colour No mucus	Less coloured Slight traces of clear mucus	Becoming discoloured Opaque mucus	[1]Yellowish Milky mucus
	Flesh (cut from abdomen)	Bluish, translucent, smooth, shining No change in original colour	Velvety, waxy, dull Colour slightly changed	Slightly opaque	[1]Opaque
	Colour (along vertebral column)	Uncoloured	Slightly pink	Pink	[1]Red
	Organs	Kidneys and residues of other organs should be bright red, as should the blood inside the aorta	Kidneys and residues of other organs should be dull red; blood becoming discoloured	Kidneys and residues of other organs and blood should be pale red	Kid

RIVO

Freshness ratings: Council Regulation (EEC) No. 103/76 OJ No. L20 (28 January 1976) (EEC, 1976)					
		E	A	B	Rejction
Condition	Flesh	Firm and elastic Smooth surface	Less elastic	Slightly soft (flaccid), less elastic Waxy (velvety) and dull surface	[1]Soft (flaccid) Scales easily detached from skin, surface rather wrinkled, inclining to mealy
	Vertebral column	Breaks instead of coming away	Sticks	Sticks slightly	[1]Does not stick
	Peritoneum	Sticks completely to flesh	Sticks	Sticks slightly	[1]Does not stick
Smell	Gills, skin abdominal cavity	Seaweed	No smell of seaweed or any bad smell	Slightly sour	[1]Sour

E, A and B is not enough!!!



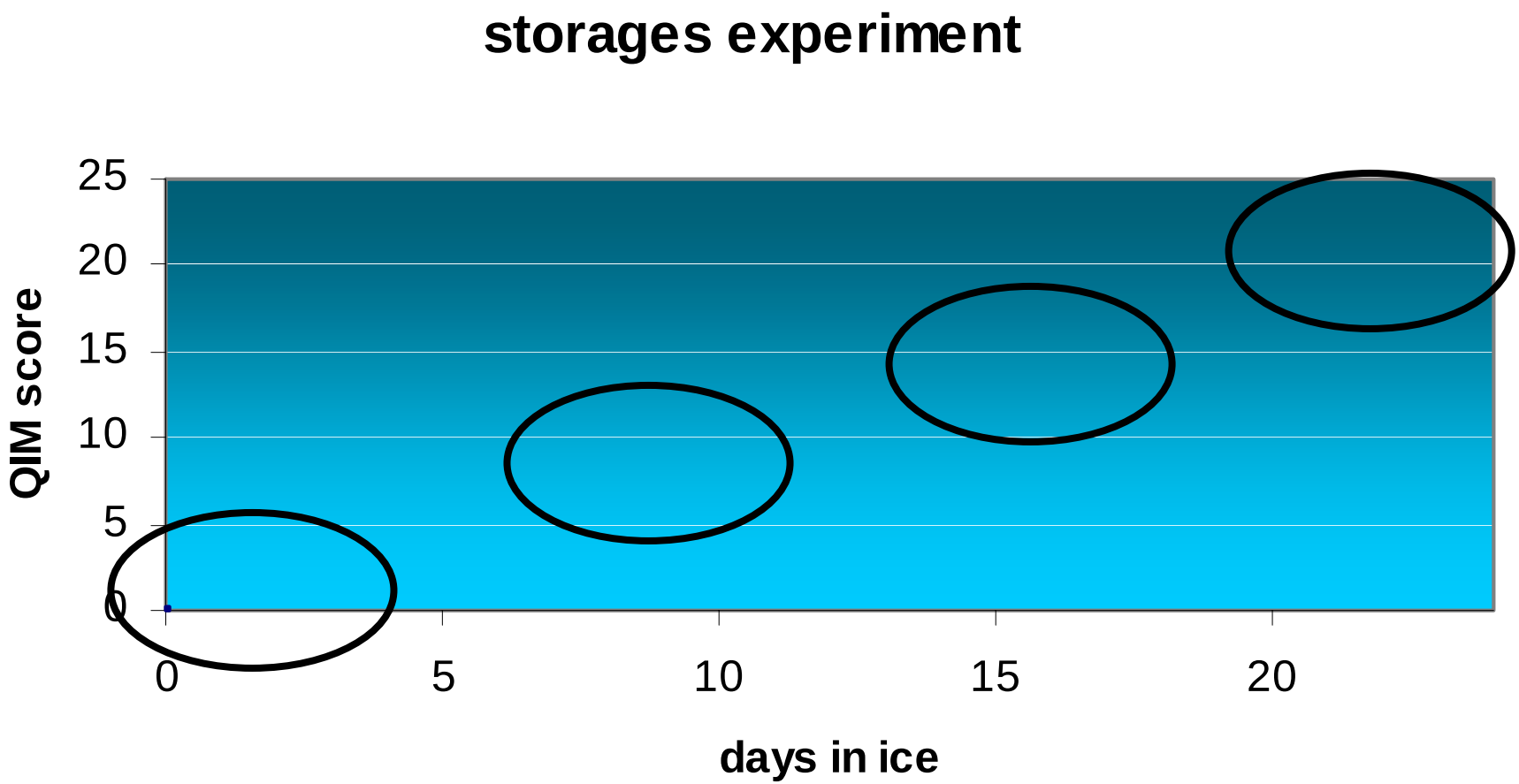


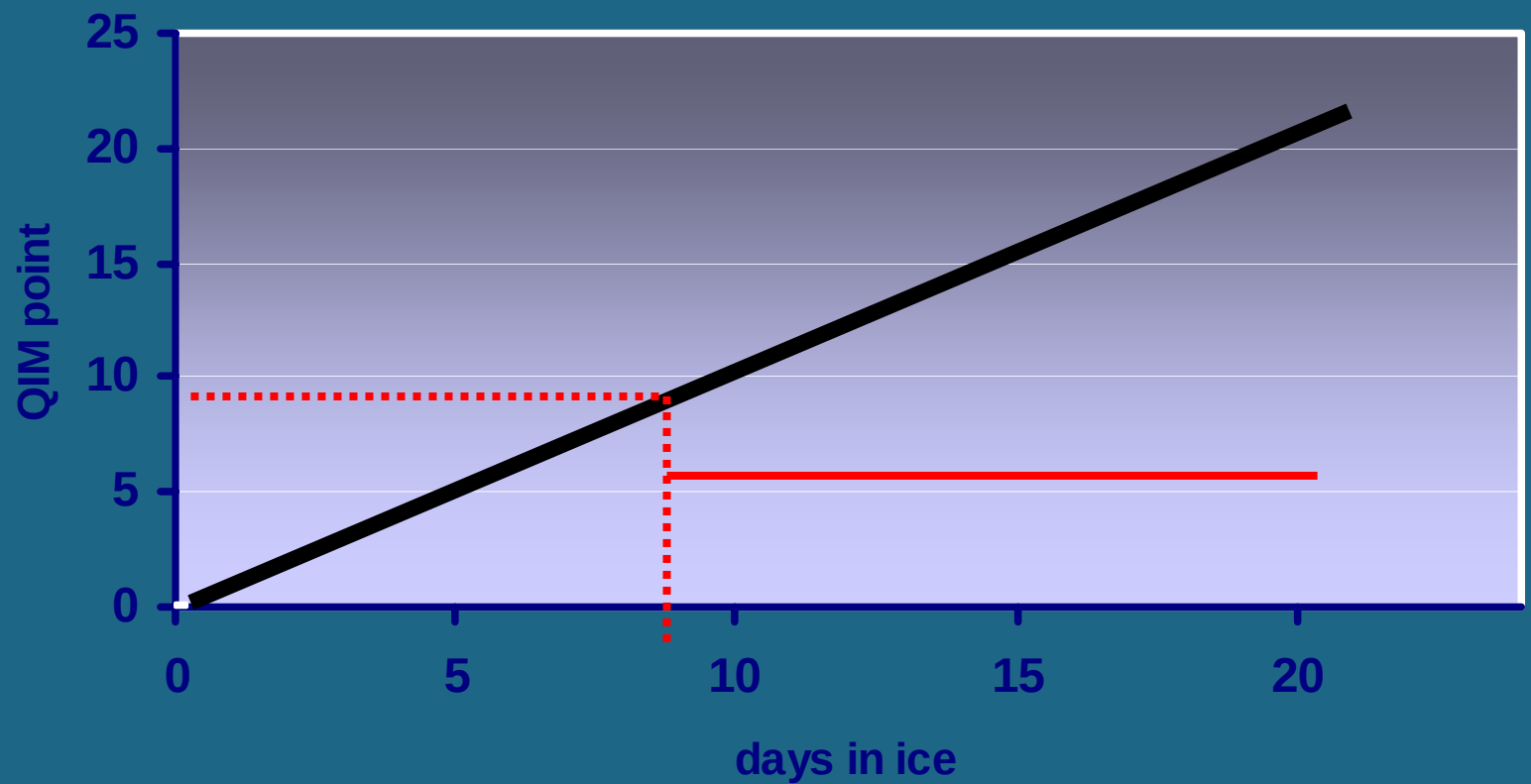
QIM

- Rapid
- Easy to use
- Medium training
- Differences between species
- One parameter at a time (forced choice)
- Estimation of remaining shelf life

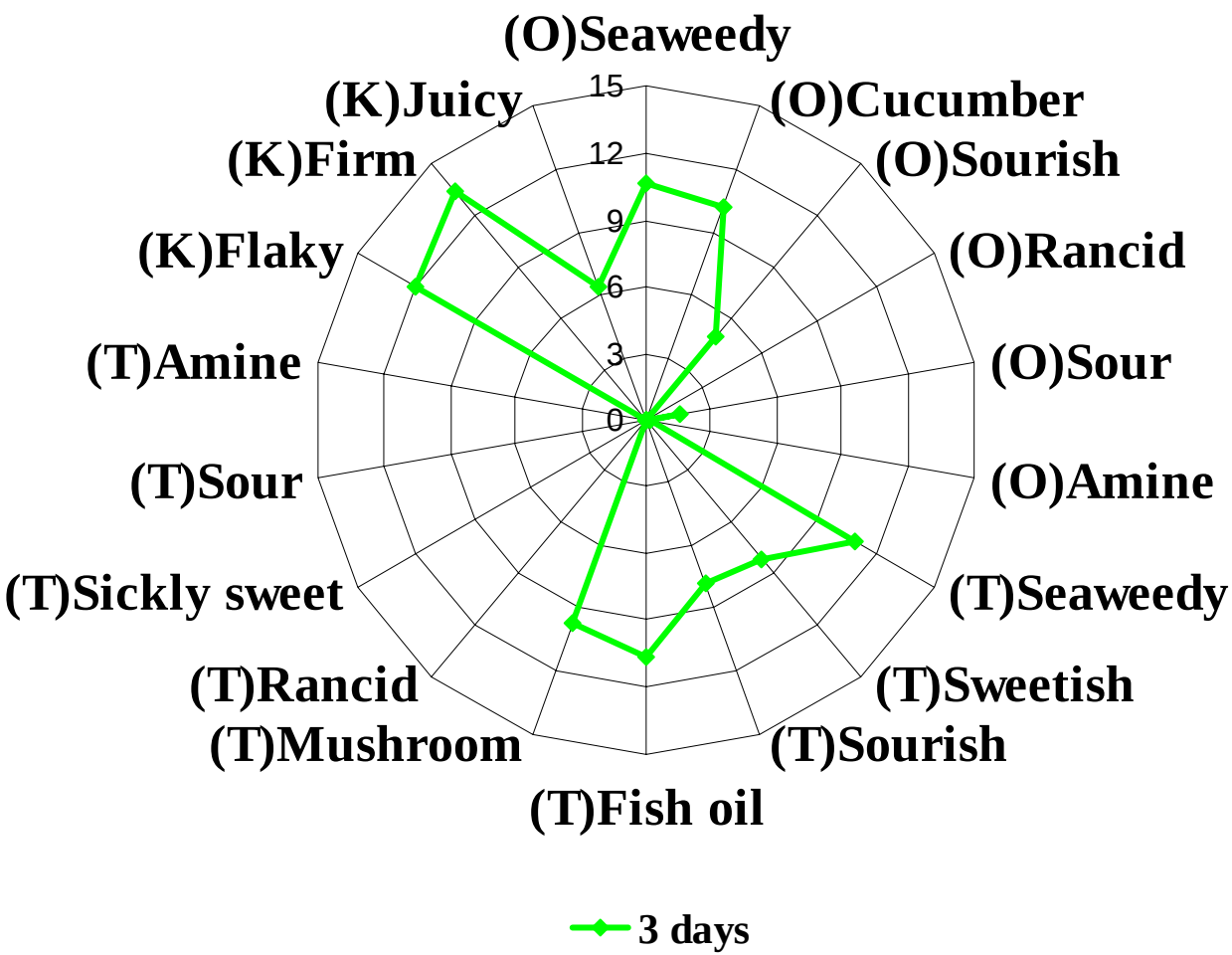
QIM

- Storage experiment
  - storage in ice at 0 C
- QIM scheme for raw salmon
  - development of the scheme
- Descriptive sensory evaluation of cooked salmon
  - vocabulary development
  - sensory profiling
- photograph

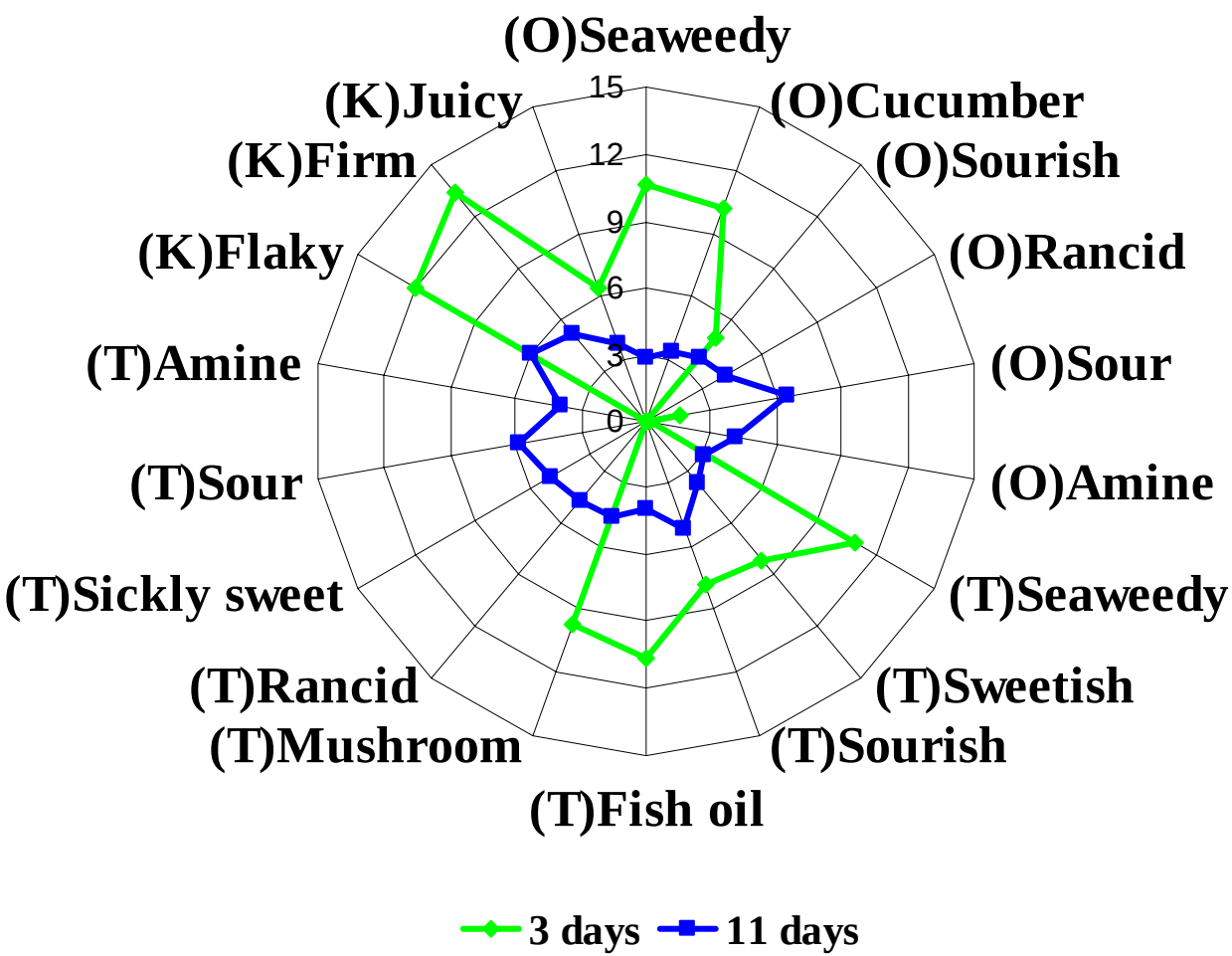

storages experiment
QIM score
25
20
15
10
5
0
0
5
10
15
20
days in ice


25
20
15
10
5
0
QIM point
0
5
10
15
20
days in ice

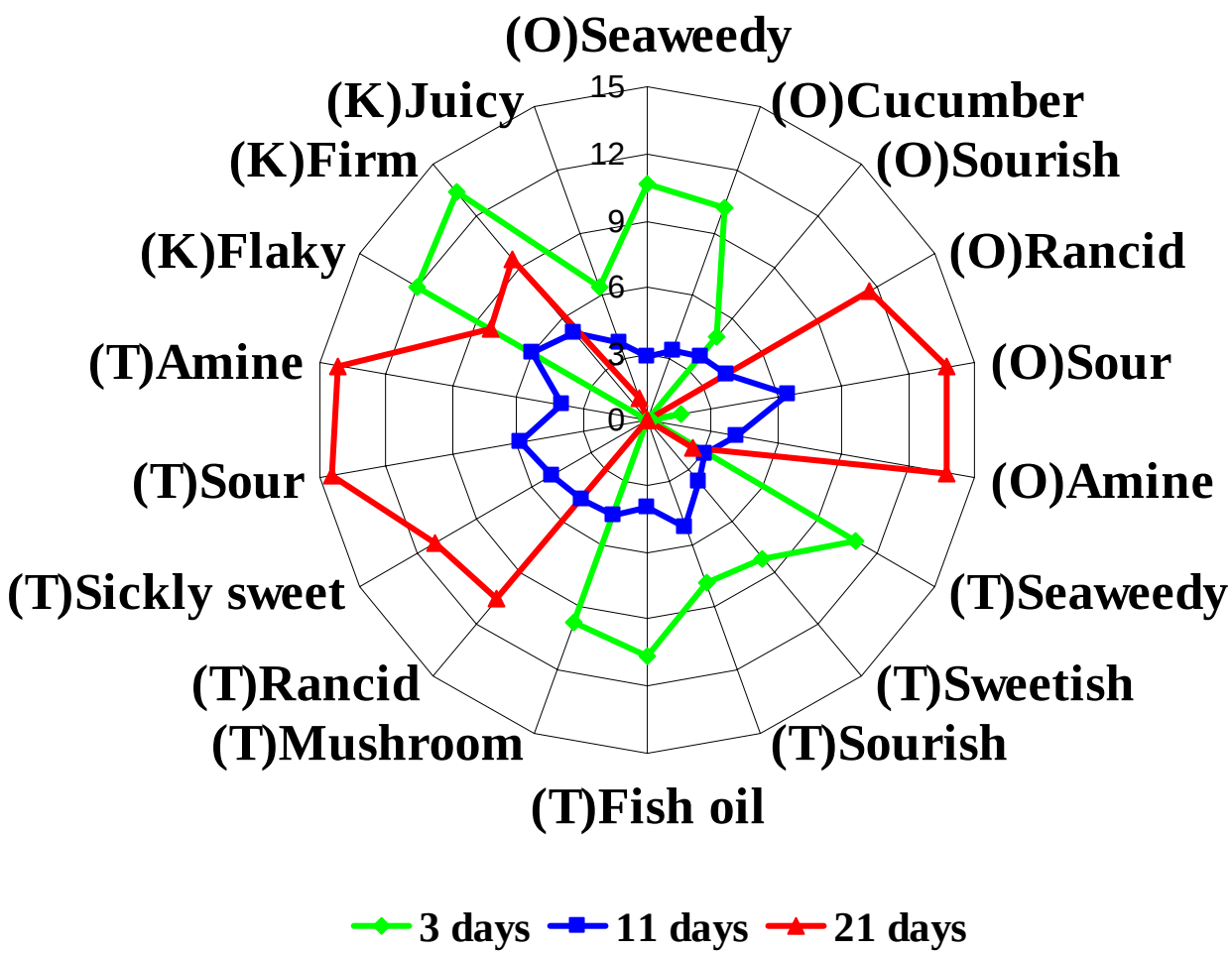
Sensory profiling of farmed salmon



Sensory profiling of farmed salmon



Sensory profiling of farmed salmon

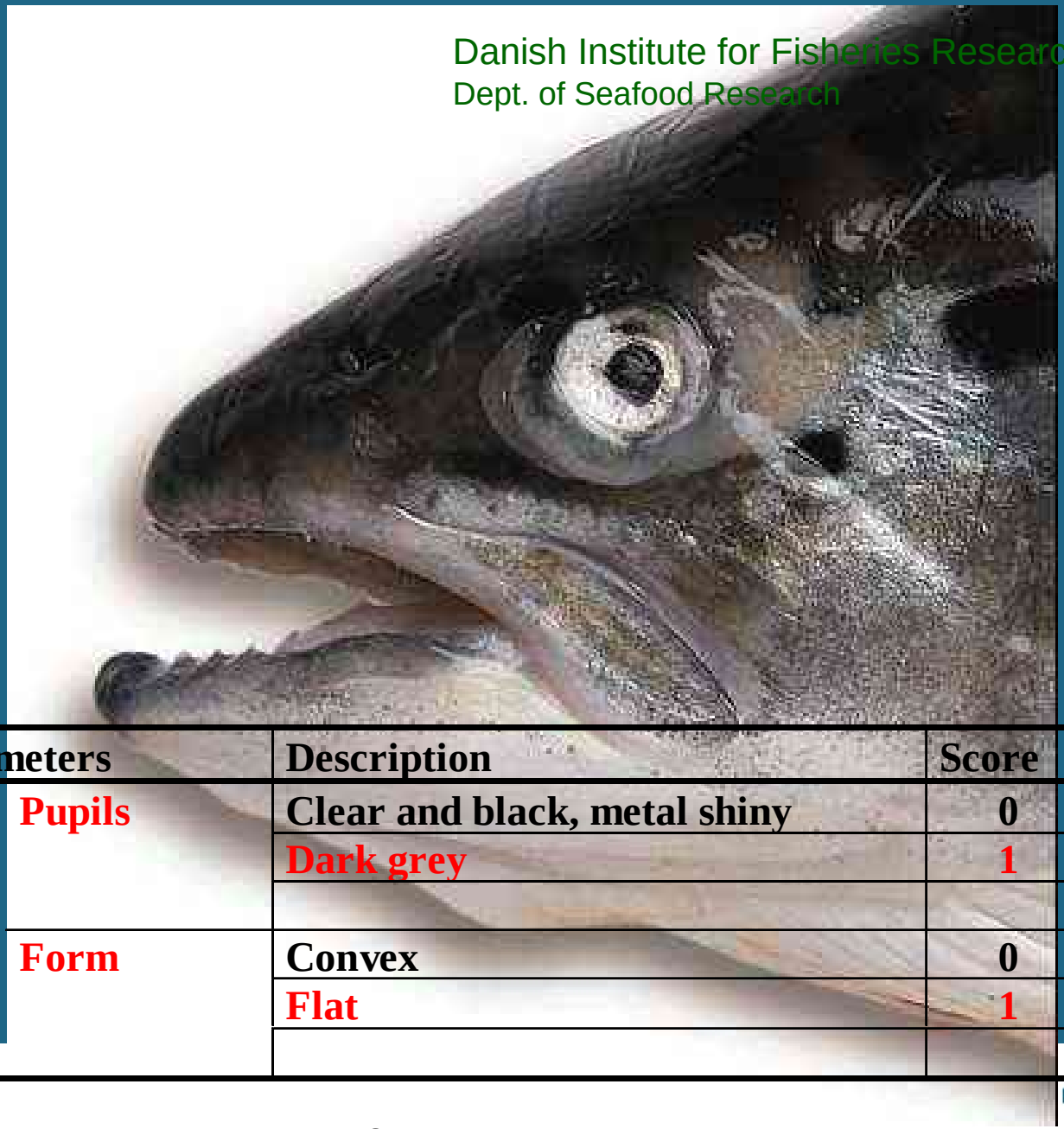


Quality parameters		Description	Score
Skin	Colour/ appearance	Pearl-shiny all over the skin	0
	Mucus	Clear, not clotted	0

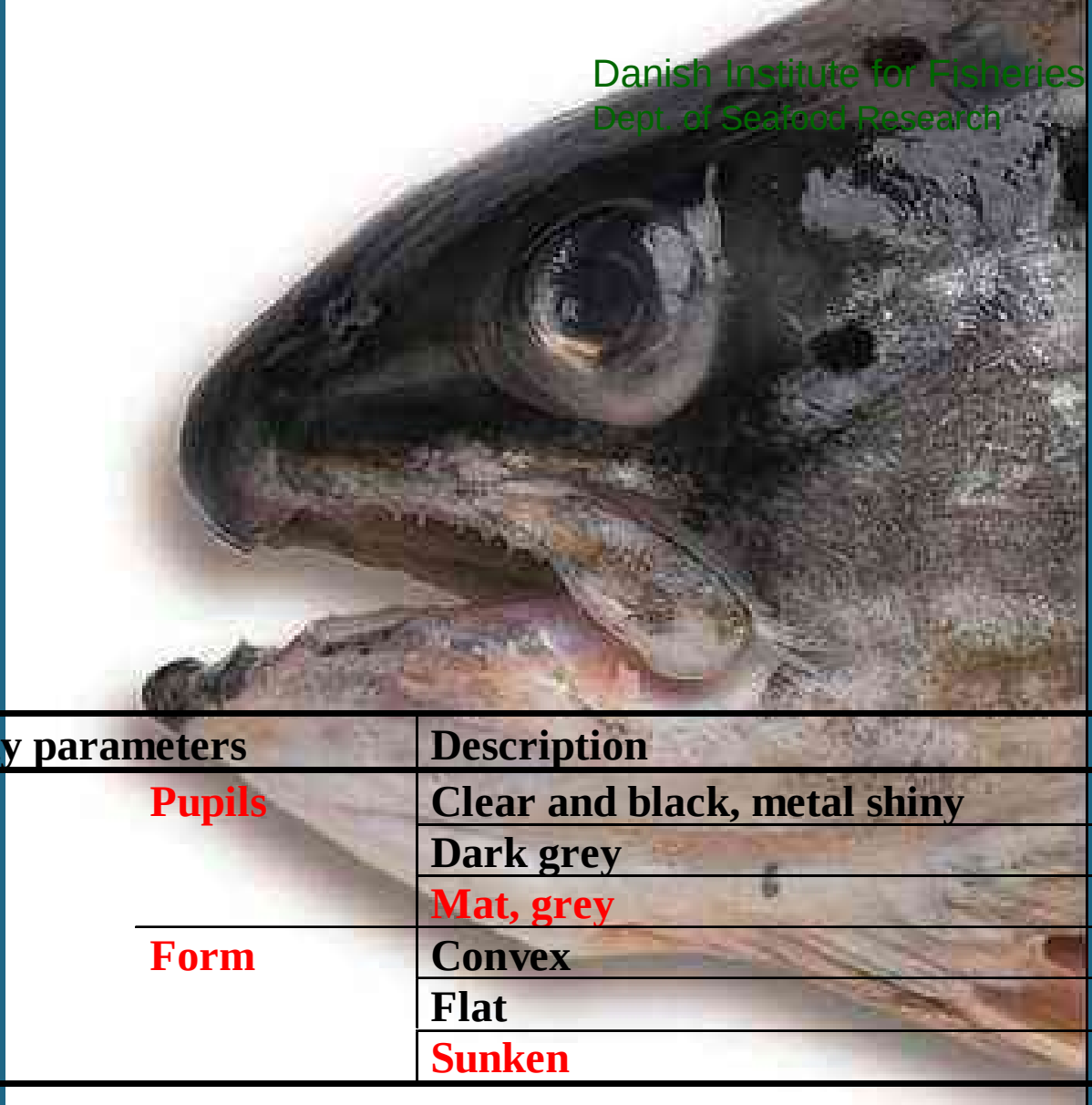
Quality parameters		Description	Score
Skin	Colour/ appearance	Pearl-shiny all over the skin	0
		The skin is less pearl-shiny	1
	Mucus	Clear, not clotted	0
		Milky, clotted	1

Quality parameters		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

Quality parameters		Description	Score
Eyes	Pupils	Clear and black, metal shiny	0
	Form	Convex	0



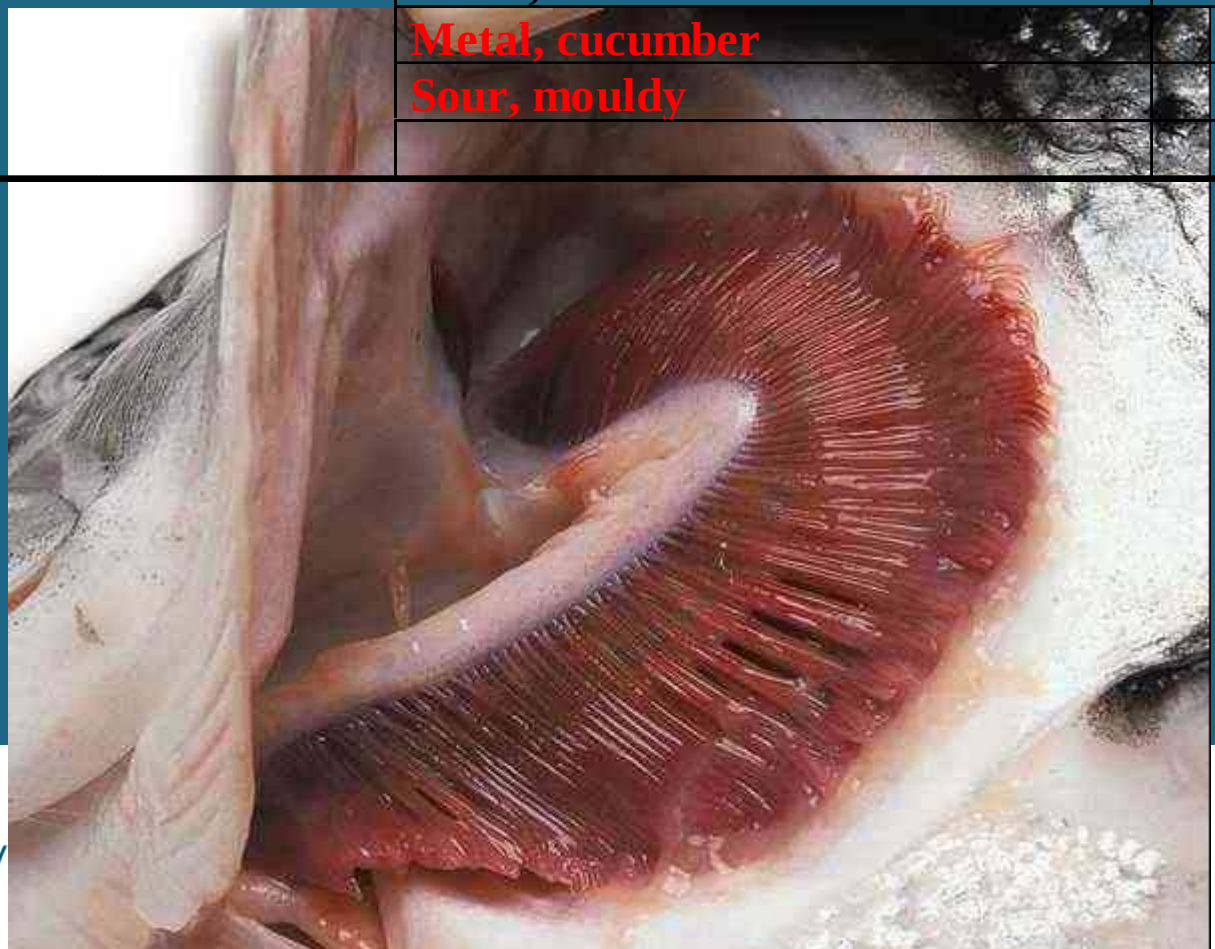
Quality parameters		Description	Score
Eyes	Pupils	Clear and black, metal shiny	0
		Dark grey	1
	Form	Convex	0
		Flat	1



Quality parameters		Description	Score
Eyes	Pupils	Clear and black, metal shiny	0
		Dark grey	1
		Mat, grey	2
	Form	Convex	0
		Flat	1
		Sunken	2

Quality parameters		Description	Score
Gills	Colour/ appearance	Red/dark brown	0
	Mucus	Transparent	0
	Odour	Fresh, seaweed	0

Quality parameters		Description	Score
Gills	Colour/ appearance	Red/dark brown	0
		Light red, pink/light brown	1
	Mucus	Transparent	0
		Milky, clotted	1
	Odour	Fresh, seaweed	0
		Metal, cucumber	1
		Sour, mouldy	2



Danish Institute for Fisheries Research
Dept. of Seafood Research

QIM EUROFISH

Quality parameters		Description	Score
Gills	Colour/ appearance	Red/dark brown	0
		Light 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

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Quality Index Method (QIM) scheme for farmed salmon

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, neutral	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
		Mat, grey	2
	Form	Convex	0
		Flat	1
		Sunken	2

QIM® EUROFISH

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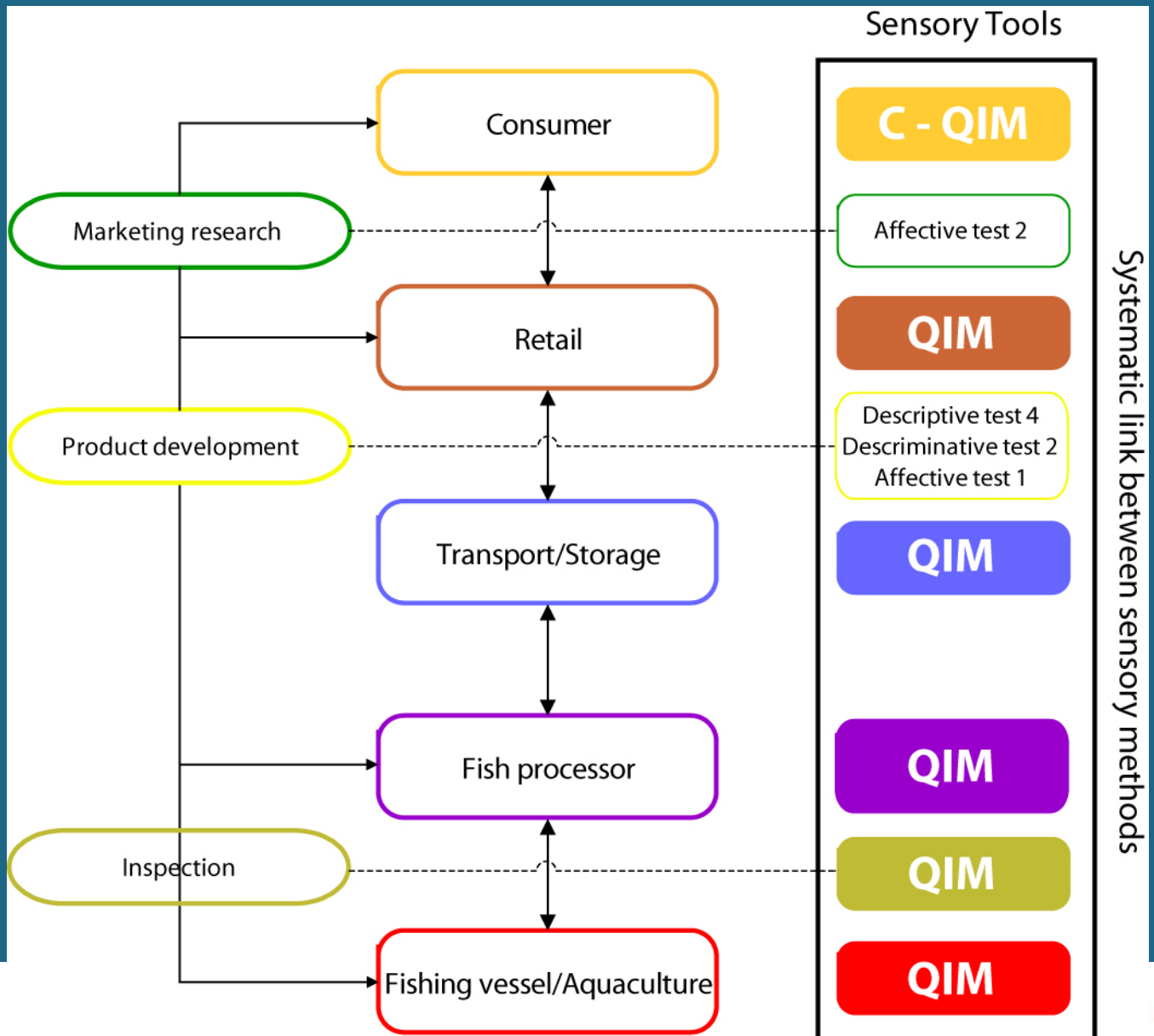
Gills	**Colour**	Red/dark brown	**0**
		Pale red, pink/light brown	**1**
		Grey-brown, brown, grey, green	**2**
	Mucus	Transparent	**0**
		Milky, clotted	**1**
		Brown, clotted	**2**
	Odour	Fresh, seaweed	**0**
		Metal, cucumber	**1**
		Sour, mouldy	**2**
		Rotten	**3**
Abdomen	**Blood in**	Blood red/not present	**0**
	abdomen	Blood more brown, yellowish	**1**
	Odour	Neutral	**0**
		Cucumber, melon	**1**
		Sour, fermenting	**2**
		Rotten/rotten cabbage	**3**
Quality Index			**0-24**

C-QIM

Quality parameter	Instruction	Description	Score
Appearance	Brightness of skin	Bright	0
		Reduced brightness	1
		Dull	2
Odour	Belly	Sea, sea weed	0
		Neutral	1
		Off odour	2
Texture	Press with thumb and forefinger along the back of the fish	Firm	0
		Firm/soft	1
		Soft	2
C-Quality Index			Max. 6

Sensory relation

QIM	C-QIM	Sensory Profile		
QI =	C-QI =	*Smell*	*Taste*	*Texture*
3	1	Sea, cucumber	Sea, sweet, fish oil, champignon	Firm, flaky
9	3	Neutral	Neutral	Soft
20	6	Rancid, sour, fishy	Rancid, sickly sweet, sour, fishy	Firm


Sensory Tools
Consumer
Marketing research
Retail
Product development
Transport/Storage
Fish processor
Inspection
Fishing vessel/Aquaculture
C - QIM
Affective test 2
QIM
Descriptive test 4
Descriminative test 2
Affective test 1
QIM
QIM
QIM
QIM
Systematic link between sensory methods

Danish Institute for Fisheries Research
Dept. of Seafood Research

To sum up

- *Fish quality standards*
- *application*
- *16 QIM schemes*
- *language!*
- *Schemes for the most important species*

QI 0

QI 20

European Commission Thematic Programme 1 -
Quality of Life and Management of Living Resources (QoL)
Key Action 1 - Food, Nutrition & Health

Introduction of Quality Index Method (QIM) in the European fishery chain

Accompanying measure project EU-QLK1-CT-2002-30152

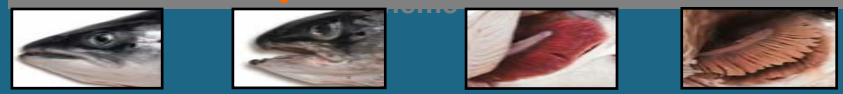
Objectives of QIMCHAIN

- Introduce and stimulate implementation of QIM in the relevant parts of the European fishery chain
- Raise the awareness of the benefits of using standardised methods for evaluating fish freshness in Europe
- Exploit research results on QIM in the European fish sector
- Identify the need for further research to be able to provide the European fish sector with multilingual tool for all important fish species

Quality Index Method (QIM)

QIM is an accurate and objective sensory method for the determination of fish freshness. It offers highly reliable information on fish quality thus facilitating and enhancing management in fish processing and marketing

QIM-scheme for salmon



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		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
		Mat, 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

Workplan of QIMCHAIN

Translate the QIM EUROFISH reference manual into seven European languages for end-users e.g. fish-auctions, fish processing industry, retailers, inspection bodies and research institutes

Publish information about QIM methodologies and practical applications popular fish trade journals at national and European level

Create web-site with detailed information on QIM http://www.qim-eurofish.com/

Create and establish QIM network-platform for partners in the fishery chain, authorities and scientists

Organise two QIM workshops for demonstration of the effectiveness and user-friendliness of the QIM scheme to the European fish sector

Active dissemination of QIM knowledge by participation at important European fish exhibitions

maritech RIVO RIVO

Fiskeriforskning

Ministry of Food, Agriculture and Fisheries
Danish Institute for Fisheries Research

IPIMAR Instituto de Investigação das Pescas e do Mar

AZTI

WAGENINGEN UR

Samræmt mat á ferskum fiski í Evrópu
QIM (gæðastuðulsaðferðin)

Emilía Martinsdóttir
Rannsóknastofnun fiskiðnaðarins
Skúlagata 4
sími 354 562 0240, fax 354 562 0740
e-mail: emilia@rf.is

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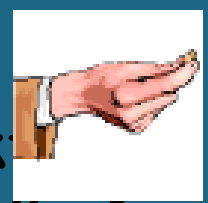
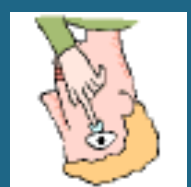
WAGENINGEN UR

Hvað er skynmat?

- Skynmat er kerfisbundið mat á lykt, bragði, útliti og áferð matvæla

- Í skynm u skynfæri mannsins, þ.e. lykt bragð-,sjón-, snerti - og hreyfiskyn notuð til að meta gæði matvæla





Skynmat í íslenskum fiskiðnaði

- Heill fiskur
  - ferskleikaflokkun ESB (E, A og B)
  - gæðastuðulsaðferð (QIM)
- Flök
  - Hrá, flokkun í 4 til 5 flokka eftir lit, lykt og
  - Soðin, Torry einkunnaskali (10 punkta eð breskir kaupendur

Skynmat á ferskleika fisks gefur mjög mikilvægar upplýsingar um gæði

Ferskur fiskur geymist skamman tíma

- Skynmat
  - seinlegt (QIM og EU-flokkun)??
  - þjálfun matsmanna, skýrir einkunnaskalar og leiðbeiningar
- Sýnataka
  - Ekki er unnt að meta ferskleika á blönduðum afla á öruggan hátt
  - Dagmerkingar, einsleitt safn : 3 til 5 fiskar metnir

Gæðastuðuls-aðferði

- Margir gæðaþættir metnir fyrir hvert sýni
- Hver gæða-þáttur fær einkunn 0-3 eða 0-2 eftir vægi
- Einkunnir lagðar saman í gæða-stuðul

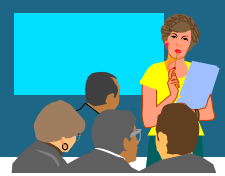
Gæðaþáttur		Lýsing	Einkunn
Útlit/áferð	Litur/útlit	Gljái yfir öllum fiskinum (minnir á perlu)	0
		Fiskurinn hefur minni gljáa	1
		Fiskurinn er gulleitur, aðallega nálægt kviðarhc	2
	Slím	Tært, ekki kekkjað	0
		Mjólkurlitað, kekkjað	1
		Gult og kekkjað	2
	Lykt	Ferskt þang, hlutlaus	0
		Gúrka, hey, málmlykt	1
		Súr, borðtuskulykt	2
		Úldin	3
	Áferð	Í dauðastirðnun	0
		Far eftir fingur hverfur fljótt	1
		Far eftir fingur er sjáanlegt eftir 3 sek	2
Augu	Litur/tærleiki	Tær og svört, málmgljái	0
		Dökk grá	1
		Mött, grá	2
	Form	Kúpt	0
		Flöt	1
		Sokkin	2
Tálkn	Litur	Rauð/dökk brún	0
		Ljósrauð, bleik/ljósbrún. Upplituð	1
		Grábrún, brún, grá, græn	2
	Slím	Tært	0
		Mjólkurlitað, kekkjað	1
		Brúnt, kekkjað	2
	Lykt	Fersk, þanglykt	0
		Málmlykt, gúrka, gras	1
		Súr, fúkkalykt	2
		Úldin	3
Kviðarhol	Blóð í kviðarholi	Blóðrautt eða ekki til staðar	0
		Meira brúnleitt, gulleitt	1
	Lykt	Hlutlaus	0
		Gúrka, melóna	1
		Minnir á gerjun, súr	2
		Úldin/úldið kál	3
Gæðastuðull fyrir lax			0-24

RIVO

QIM prese

Kostir QIM gæðastuðulsaðferðarinnar

- Matsmaður þarf að meta alla gæðaþætti
- Hlutlæg skynmatsaðferð, henni fylgja leiðbeiningar og myndefni
- Gæðastuðull fylgir beinni línu eftir geymslutíma í ís
- Með henni má áætla hversu mikið er eftir af geymsluþoli
- Mjög góð til að kenna óvönu fólki að meta fisk
- Hentug til að samræma og þjálfa matsfólk



EU-verkefnið QimIT

Janúar 1998 - apríl 2000

Markmið:

- Koma á samevrópsku kerfi við gæðamat á fiski með því að
  - þróa og tölvuvæða gæðastuðulsaðferðina (QIM) við skynmat á ýmsum fisktegundum
  - ljósmyndir af fiski
  - leiðbeiningar við þjálfun matsfólks

QimIT - Þátttakendur

- *Af hálfu Íslands*:
  - Rannsóknastofnun fiskiðnaðarins
  - TölvuMyndir
  - Fiskmarkaður Suðurnesja
  - Haraldur Böðvarsson h.f.
  - Hólmadrangur h.f.

- *Af hálfu Hollands*:
  - RIVO-DLO Rannsóknastofnun í Hollandi
  - IJmuiden og Den Helder, fiskmarkaðir

Fisktegundir og tungumál

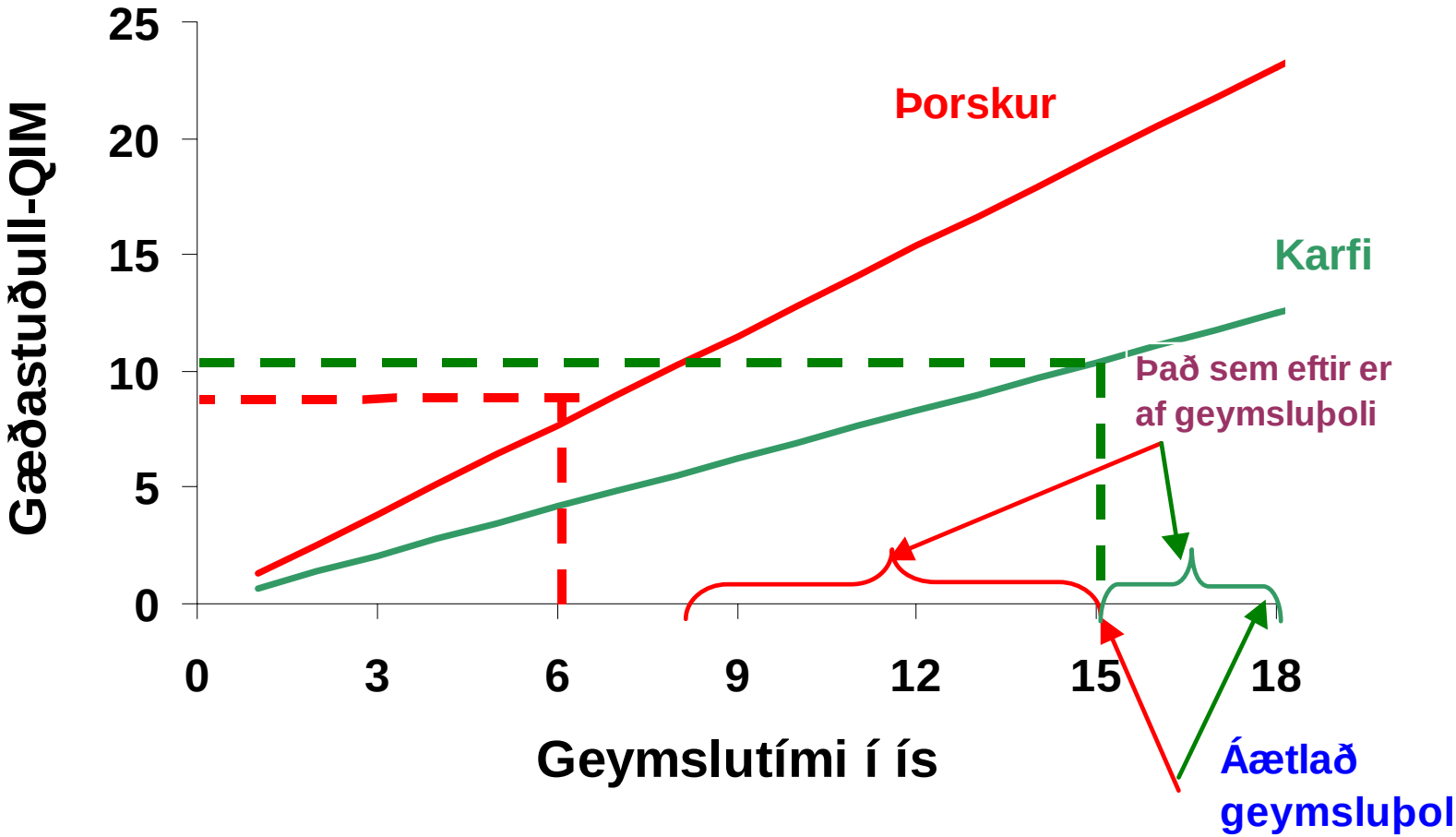
- Ísland:
  - Þorskur, ýsa, karfi, ufsi, lax og rækja
- Holland: Fjórar flatfisktegundir
  - skarkoli, sandhverfa, sólkoli-flúra og deplahverfa
- Samstarf við Danmörku
  - síld

Tungumál: enska, íslenska, hollenska og danska

QimIT - Gæðastuðull til framleiðslustýringar

- QIM-einkunnaskalar voru þróaðir og geymsluþol (dagar í ís) ákvarðað með geymslutilraunum við bestu aðstæður þar sem skynmat á soðnum fiski, örverutalningar og efnamælingar voru til hliðsjónar
- Gæðastuðull hráefnis gefur til kynna hversu lengi hráefnið hefur verið geymt í ís
- Með þessum upplýsingum er hægt að áætla hversu langt er eftir af geymsluþoli hráefnis

Gæðastuðull fisks breytist línulega með geymslutíma í ís



Niðurstöður QimIT

- Hugbúnaðarkerfi og handbækur
  - Gæðastuðulsaðferð með myndum og leiðbeiningum
  - Þjálfunarkerfi fyrir matsfólk
- Samræmdar aðferðir við ferskleikamat á heilum fiski
  - við kaup og sölu á fiski, fiskmarkaðir, fiskvinnsla
  - þjálfun og kennslu
- ***Möguleikar:***

Þýða á fleiri tungumál

Bæta við fisktegundum

Hvers vegna tölvustýrt?

- Meiri líkur á að aðferðin verði notuð
- Fljótlegt og öruggt mat
- Allir (eiga að) geta treyst á að matið sé rétt framkvæmt
- Miðlæg og stöðluð skráning- öll skráning er framkvæmd á sama hátt
- Gefur kost á ýmiss konar tölfræði og öðrum úrvinnslumöguleikum
- Rekjanlegar upplýsingar um gæði fisks

WiseFresh hugbúnaðurinn

- Maritech International vinnur að markaðssetningu
- HB og ÚA
- United Fish Auctions í Hollandi (Stellendam, Colijnsplaat and Scheveningen),
  - hluti af PEFA.COM
- Innsláttarbúnaður á handtölvu

Samtökin: QIM Eurofish www.qim-eurofish.com

- Fiskirannsóknastofnanir á Íslandi, Hollandi og Danmörku hafa gert samning um samstarf á sviði gæðamats á fiski
- Markmiðið er að stuðla að samræmdri og alhliða notkun gæðastuðulsaðferðar (QIM) við gæðamat á fiski í framleiðslu- og dreifingarkeðjum Evrópu

Markmið QIM Eurofish

- Stuðla að kynningu QIM meðal hagsmunaaðila í fiskkeðjunni frá veiðum að borði neytenda
- Þróa nýja QIM einkunnaskala
- Skipuleggja QIM kynningarfundi og þjálfunarnámskeið
- Hvetja til uppfærslu á þeim hugbúnaði (WiseFresh) sem til er

Markmið QIM Eurofish

- Miðla upplýsingum varðandi möguleika á að koma QIM á í fiskkeðjunni
- Hvetja umræður meðal vísindamanna, samtaka hagsmunaaðila og opinberra aðila sem fjalla um mat á fiskgæðum
- Hvetja til rannsókna varðandi gæðabreytingar á fiski og fiskaafurðum á mismunandi stigum í framleiðsluferlinu frá veiðum til neytenda

Handbók um skynmat á ferskum fiski

- Skynmat eftir gæðastuðulsaðferðinni ensku sem fjallar um mat á 12 fisktegundum ásamt myndefni
- Leiðbeiningar fyrir skynmat á fiski
- Geymsluþol á ferskum fiski í ís
  - Notkun QIM í framleiðslu- og gæðastýringu

Nýtt Evrópuverkefni: QIMCHAIN
Þátttakendur: fiskirannsóknastofnanir

- Rf, Rannsóknastofnun fiskiðnaðarins
- RIVO Hollandi
- DIFRES, Danmörku
- BFAFi , Þýskalandi
- NIFA, Noregi
- IPIMAR, Portúgal
- AZTI Spáni

Hugbúnaðar-fyrirtækið

- MARITECH Íslandi

Verkefni: QIMCHAIN

- Skipuleggja og taka þátt í fundum
  - hagsmunaaðilum í fiskkeðjunni, yfirvöldum og vísindamönnum
- Halda tvær QIM námstefnur í Evrópu fyrir gæðastjóra
- Kynna QIM á sjávar útvegssýningum í Evrópu

Verkefni: QIMCHAIN

- Þýða handbókina á sjö evrópsk tungumál
  - fyrir fiskmarkaði, fiskiðnað, dreifingaraðila, eftirlits- og rannsóknastofnanir
- Birta upplýsingar um QIM
  - innlendum og evrópskum sjávarútvegstímaritum
- Heimasíða um QIM

  www.qim-eurofish.com

Framtíðaráform : Samræmdar aðferðir við ferskfiskmat í Evrópu

- Þróa einkunnaskala fyrir fleiri fisktegundir
- Rannsaka áhrif mismunandi geymsluaðferða og meðhöndlunar á QIM einkunnaskala.
- Þróa frekari skynmatsaðferðir fyrir mat á fiskflökum og fiskafurðum

Kostir samræmdra (tölvuvæddra) aðferða við fiskmat í Evrópu

- Greiða fyrir samskiptum kaupenda og seljenda
- Uppfylla kröfur eftirlits- og reglugerðar aðila
- Rekjanlegar upplýsingar varðandi gæði á fiski
- Greiða fyrir viðskiptum á fiskmörkuðum með óséðan fisks
- Bæta gæða- og framleiðslustjórnun í fiskiðnaði

Staða QIM varðandi reglugerðir ESB

- Núverandi reglugerðir kveða á um notkun ESB-einkunnaskalans
- ESB hefur styrkt þessi tvö verkefni og sýnt mikinn áhuga á niðurstöðum
- Reglugerðum verður ekki breytt nema iðnaðurinn sýni áhuga á og taki sjálfur upp notkun aðferðarinnar

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Quality of Life and Management of Living Resources (QoL)
Key Action 1 - Food, Nutrition & Health

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- Introduce and stimulate implementation of QIM in the relevant parts of the European fishery chain
- Raise the awareness of the benefits of using standardised methods for evaluating fish freshness in Europe
- Exploit research results on QIM in the European fish sector
- Identify the need for further research to be able to provide the European fish sector with multilingual tool for all important fish species

Quality Index Method (QIM)

QIM is an accurate and objective sensory method for the determination of fish freshness. It offers highly reliable information on fish quality thus facilitating and enhancing management in fish processing and marketing

QIM-scheme for salmon




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
		Mat, 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


Workplan of QIMCHAIN

Translate the QIM EUROFISH reference manual into seven European languages for end-users e.g. fish-auctions, fish processing industry, retailers, inspection bodies and research institutes

Publish information about QIM methodologies and practical applications popular fish trade journals at national and European level

Create web-site with detailed information on QIM http://www.qim-eurofish.com/

Create and establish QIM network-platform for partners in the fishery chain, authorities and scientists

Organise two QIM workshops for demonstration of the effectiveness and user-friendliness of the QIM scheme to the European fish sector

Active dissemination of QIM knowledge by participation at important European fish exhibitions

What is fresh fish? The Quality Index Method (QIM) gives the answer

Joop Luten

Head Department Seafoodtechnology and Aquaculture

Netherlands Institute for Fisheries Research (RIVO), The Netherlands

Projectmanager

QIM® EUROFISH

RIVO

WAGENINGEN UR

Outline

- A few articles from the Dutch press
- Principles of Quality Index Method (QIM)
- Scientific development and state of the art of QIM in Europe
- How to implement QIM in the chain?
- Future
- Conclusions

Dutch consumer organisation 1999

Kabeljauw

met een ammoniakluchtje

Supermarkt levert vaak rotte vis

Als u op een lekkere verse kabeljauw uit bent, kunt u het best naar een goede viswinkel of -kraam gaan. De nieuwe, zuurstofarm verpakte vis uit de supermarkt is geen succes. Vaak krijgt u rotte vis.

De test: wat en hoe

We hebben kabeljauwfilet gekocht in supermarkten, in viswinkels en bij marktkramen. Een speciaal getraind panel van visproevers heeft beoordeeld of de vis vers van smaak was. Visdeskundigen hebben een oordeel geveld over de filleerkwaliteit. De bacteriologische staat van de vis is vastgesteld in het laboratorium. Het Testoordeel kon niet hoger uitvallen dan het oordeel voor smaak; en bij een *matig* of *slecht* oordeel voor bacteriën niet hoger dan dit.

Dutch Fisheries Magazine 2001

Kwaliteit gemeenschappelijk vriend en vijand in keten

Fijnere kwaliteitsindeling verse vis in afslag gewenst

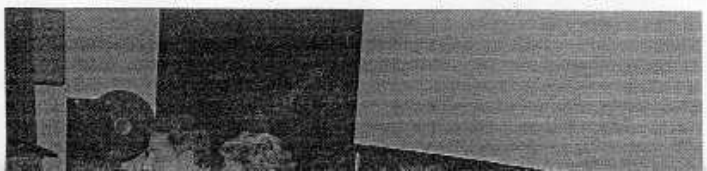
IJMUIDEN – Alle schakels in de keten hebben een gemeenschappelijke vijand: slechte kwaliteit. Kwaliteit moet ondubbelzinnig zijn te meten, ook voor kopers op afstand. De informatie vanaf zee richting de kopers moet beter, zodat die snel genoeg weten welke kwantiteit en kwaliteit er aan komt voor de veiling. Doordat het leeuwendeel van de aanvoer van verse vis in Nederland categorie A is, is een nadere indeling in kwaliteitsklassen gewenst. Ook kan gedacht worden aan een 'borgingsstelsel' voor de kwaliteit van aanvoerders, net als bij de bloemenveilingen. Dat waren enkele uitspraken gedaan op de speciale themadag over kwaliteit van het Productschap Vis afgelopen zaterdag in IJmuiden.

De presentatie van de CD-rom 'Kwaliteitsverloop Rondvis', een pleidooi voor een fijnmaziger kwaliteitsindeling van verse vis, een kijkje in de keuken van de verenigde bloemenveilingen van Nederland en de uitreiking van de Productschapsprijzen van verse vis. Zo zag het programma eruit van de studiedochtend 'Kwaliteit, een keten kwestie', die afgelopen zaterdag in het Thalia Theater werd gehouden. De bijeenkomst onderscheidde zich door de goede organisatie, en de zonder uitzondering goede en 'prettige' sprekers.

De ochtend begon met de presentatie van een CD-rom over het kwaliteitsverloop van rondvis door de hele keten door Maarten Mens, hoofd van de afdeling Handel van het PV. De CD-rom is een product van het Van Hall Instituut en gemaakt in opdracht van het PV in het kader van het project Kwaliteit. Doel van het programma is om inzicht te geven in wat er allemaal gebeurt met de vis in de keten van vangst tot en met consument, en wat de invloed daarvan is op de kwaliteit en dus de houdbaarheid. Het mooie van de CD is dat de invloed van de verschillende handelingen op de houdbaarheid kan worden gesimuleerd, door de invoer van eigen data en veronderstellingen. Hoe wordt de houdbaarheid beïnvloed als er anders wordt gewassen aan boord? Wat gebeurt er als we de rondvis MAB (met gemodificeerde atmosfeer) verpakken? Hoeveel langer is de vis houdbaar als we de temperatuur van de vitrine in de supermarkt lager instellen? Mens ging live met de CD aan de slag en liet zien dat het programma de houdbaarheid na aankoop steeds uitrekent. De zaal kon de presentatie zeker wel waarderen en zag ook het nut in van de CD-rom. Wel moet de consument erop worden gewezen dat deze goed omgaat met het aangekochte visproduct. Anders is alle moeite die in de keten vooraf is gedaan voor niets geweest.

Guus Pastoor, adjunct-secretaris van het PV, toonde aan dat het met de kwaliteit van de aangevoerde verse vis in Nederland wel goed zit. Er wordt nauwelijks vis afgekeurd. En de mindere klasse B maakte vorig jaar op Urk bij de tong 0,02 procent van de aanvoer uit, bij de schol 0,15 procent, 0,77 procent bij de kabeljauw en maar 6,56 procent bij bot. In totaal ging het om 117.678 kilo B-kwaliteit op een totaal van 39.950.198 kilo (0,29 procent). Er is een kleine categorie E (zeer goed). Keerzijde van de kleine percentages is dat vrijwel alle vis in categorie A terecht komt, terwijl binnen deze categorie volgens Pastoor nog veel verschillen zitten.

Pastoor pleitte ervoor om met behulp van de Kwaliteits Index Methode (KIM) een fijnere indeling te maken, waarbij in ieder geval A zou moeten worden verdeeld in A+ en A-. De KIM geeft strafpunten. Geen strafpunten wordt dan E, 24 strafpunten automatisch afkeur. De KIM sluit volgens Pastoor goed aan bij wat keurmeesters toch al doen.



★ *Afslagdirecteur Jaap Zwartveld praat na met bloemenveilingdirecteur Hollinger. Zou een betrouwbaarheidsindex van aanvoerders aan de visafslag ook een goed idee zijn?*

In tegenstelling tot vis maken bloemen en planten deel uit van een aanbodmarkt. F.N. Hollinger, directeur van de Bloemenveiling Oost-Nederland, hield een vermakelijk betoog over kwaliteit van de aanvoer en hoe de Nederlandse bloemenveilingen hiermee omgaan. Tegen de siertelersector wordt door de Nederlandse vissector wel opgekeken. Gezien de omzetcijfers wekt dat geen verwondering. De Nederlandse bloemenveilingen hebben bij elkaar een jaaromzet van tegen de f.9 miljard gulden, wat 35 procent is van wat er in de EU als geheel omgaat. Voor f.1 miljard wordt geïmporteerd uit landen als Kenia en Israël. Voor de siertelers in Nederland geldt een veilplicht. Kopen op afstand maakt momenteel veren. Er wordt gewerkt aan een 'betrouwbaarheidsindex' van kwekers, die in de toekomst ook gepubliceerd gaat worden! De aanvoerders aan de veilingen moeten zelf hun handtekeningen zetten onder een verklaring dat hun kwaliteit in orde is. „Aanvoerders die onbetrouwbaar blijken worden veel gekeurd en moeten die keuringen zelf betalen. Betrouwbare aanvoerders worden minder vaak gekeurd en zijn dus goedkoper uit." Bij de veilingen vinden regelmatig gerichte keuracties plaats, die ook aangekondigd worden. Er wordt hard gewerkt aan de borging van kwaliteit, door middel van certificering van alle schakels in de keten, inclusief de detailhandel.

Quality assessment fish

- Sensory analysis is most common method
- Torry schemes for fish (Shewan et al, 1953)
- Common marketing standards (Council Regulation, 2406/1996)
  - meant to be a basic framework for quality grading
  - E(xtra), A, B
- Quality Index Method
  - developed in 1985 by Allan Bremner (Tasmanian Food Research Unit)

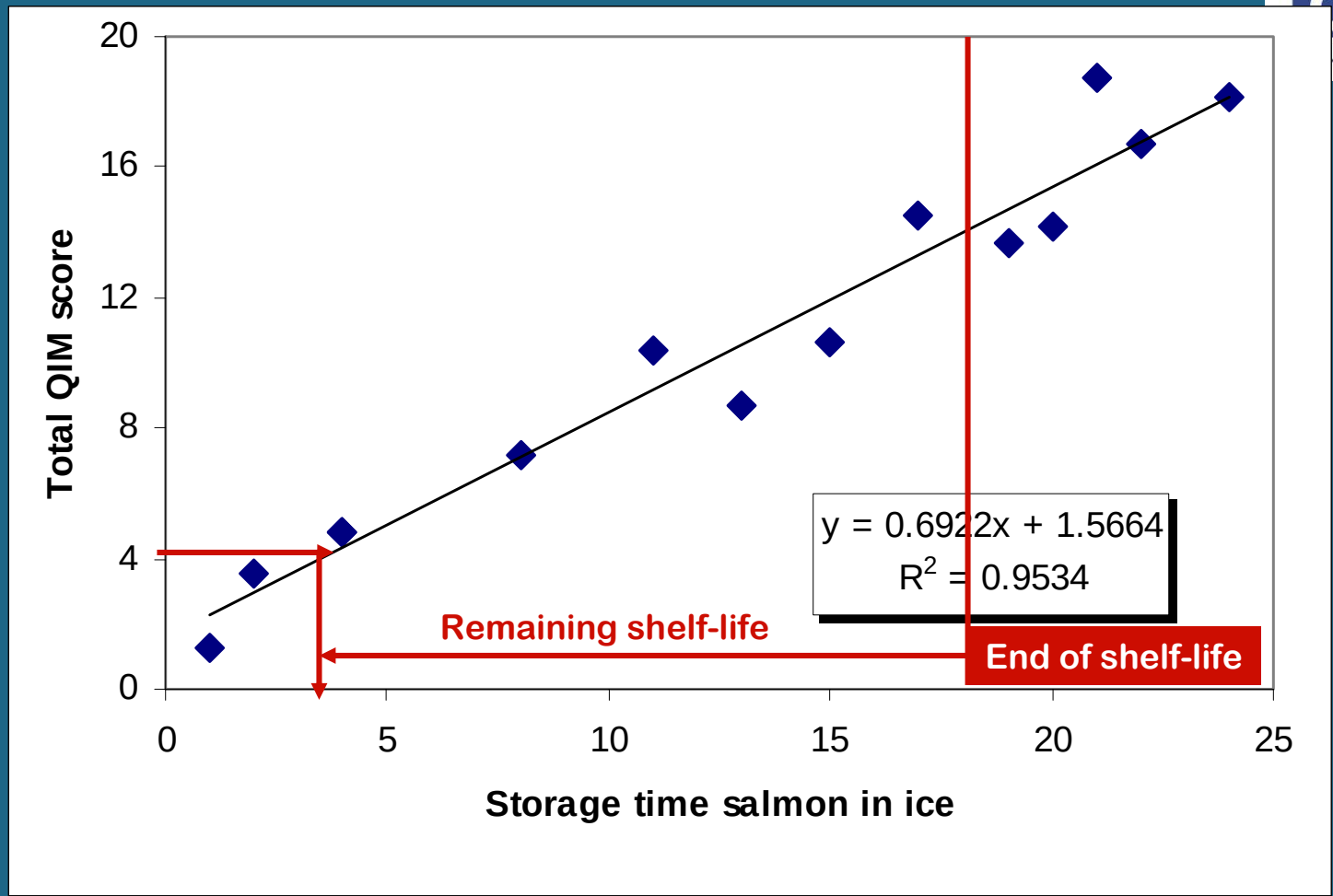
Principles Quality Index Method

- A score from 0 to max 3 demerit (index) points is given for changes in:
  - outer appearance (eyes, skin, gills)
  - smell
  - texture
- On basis of well described QIM scheme for the fishspecies
- Scores of all characteristic are summarised to give an overall (total) score
- There is a linear relationship between total QIM score and storage time of the fish in ice

QIM scheme (partly) for salmon

Freshness quality parameters		Description	QIM 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, neutral	0
		Cucumber, metal, hey	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
		Mat, grey	2
	Form	Convex	0
		Flat	1
		Sunken	2
Gills	Colour	Red/dark brown	0

QIM calibration curve for salmon



Advantages QIM

- No due emphasis is laid upon one single attribute. A sample can not be rejected on the basis of one single criterion
- Minor differences in judgements in any criterion being assessed do not unduly influence the total score
- Description of grades is precise and objective
- Total number of index points can also be used to estimate end of shelf life

Development QIM within European context

- FAR UP-2-452 “Quality management of the raw material in the food fish sector”, 1993
  - QIM principle was worked out further for two species
- AIR3CT94 2283 Concerted Action “Evaluation fish freshness”
  - standardisation of fish freshness evaluation necessary
  - QIM is a promising methodology
- CRAFT FAIR CT97 9063 “Development and implementation of a computerised sensory system (QIM) for evaluating fish freshness”
  - software developed
  - introduction QIM in Dutch and Icelandic auctions and processor

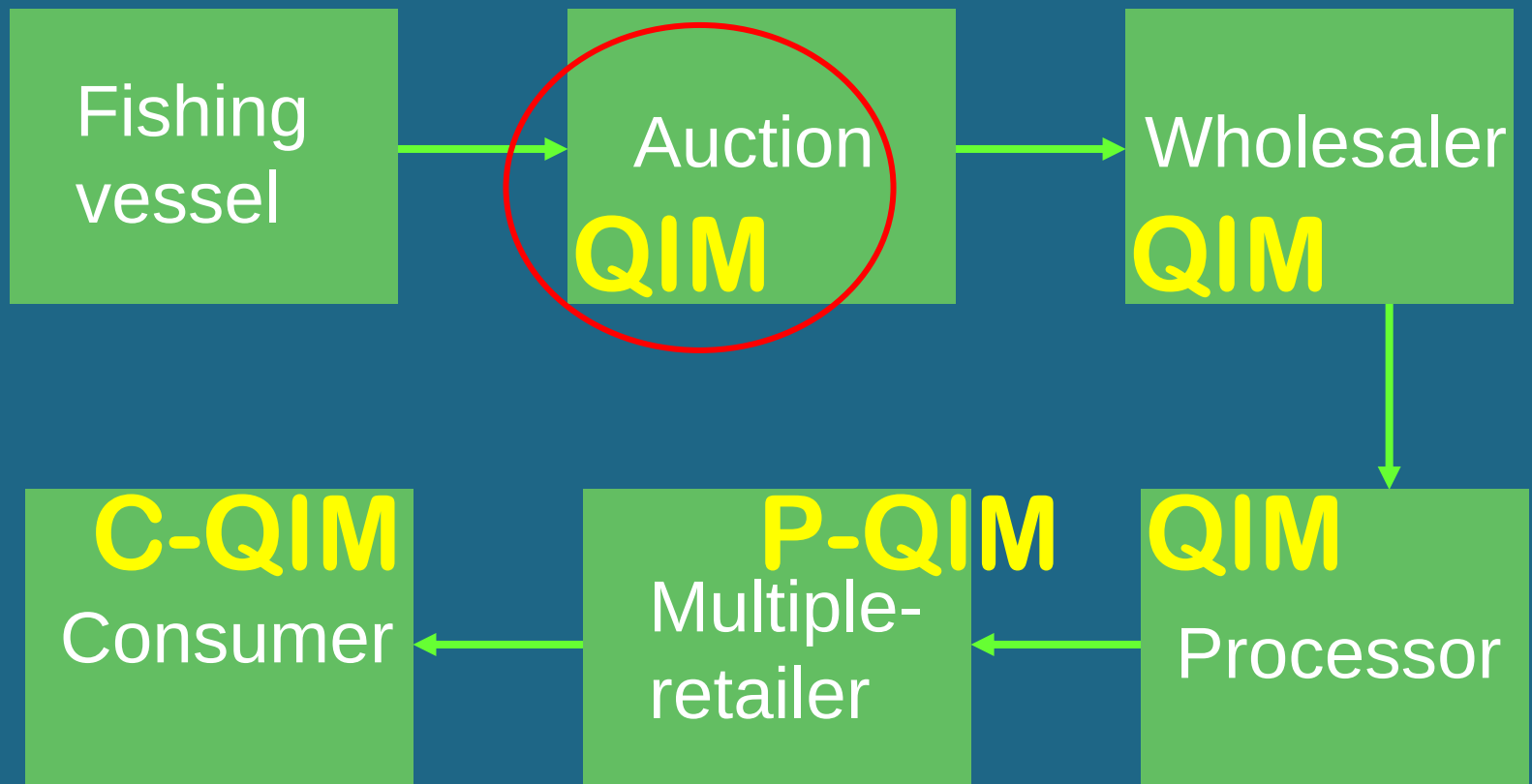
Development QIM within European context

- FLAIR PL98-4174 Concerted Action “Fish Quality Labelling and Monitoring”
  - recommendations to introduce and implement QIM
  - needs for training programs for QIM
  - QIM workshops for fish research institutes (February 2000) and salmon sector (October 2001)
- Establishment QIM Eurofish (May 2001)
  - strategic alliance RIVO, IFL, DIFRES
  - members WEFTA institutes (SFIA, BIM, FF, FRCF), PEFA (approx. 20 auctions), UFA, Wisefresh
  - QIM training on location all over Europe
  - Development new QIM schemes
  - Sound use of QIM, quality assurance of QIM

How to implement QIM in the chain?

- Simplified fishery chain
- Training
- Software
- System
- QIM and the EU market standards
- FAQ about QIM
- QIM in practice at auction Scheveningen (video)

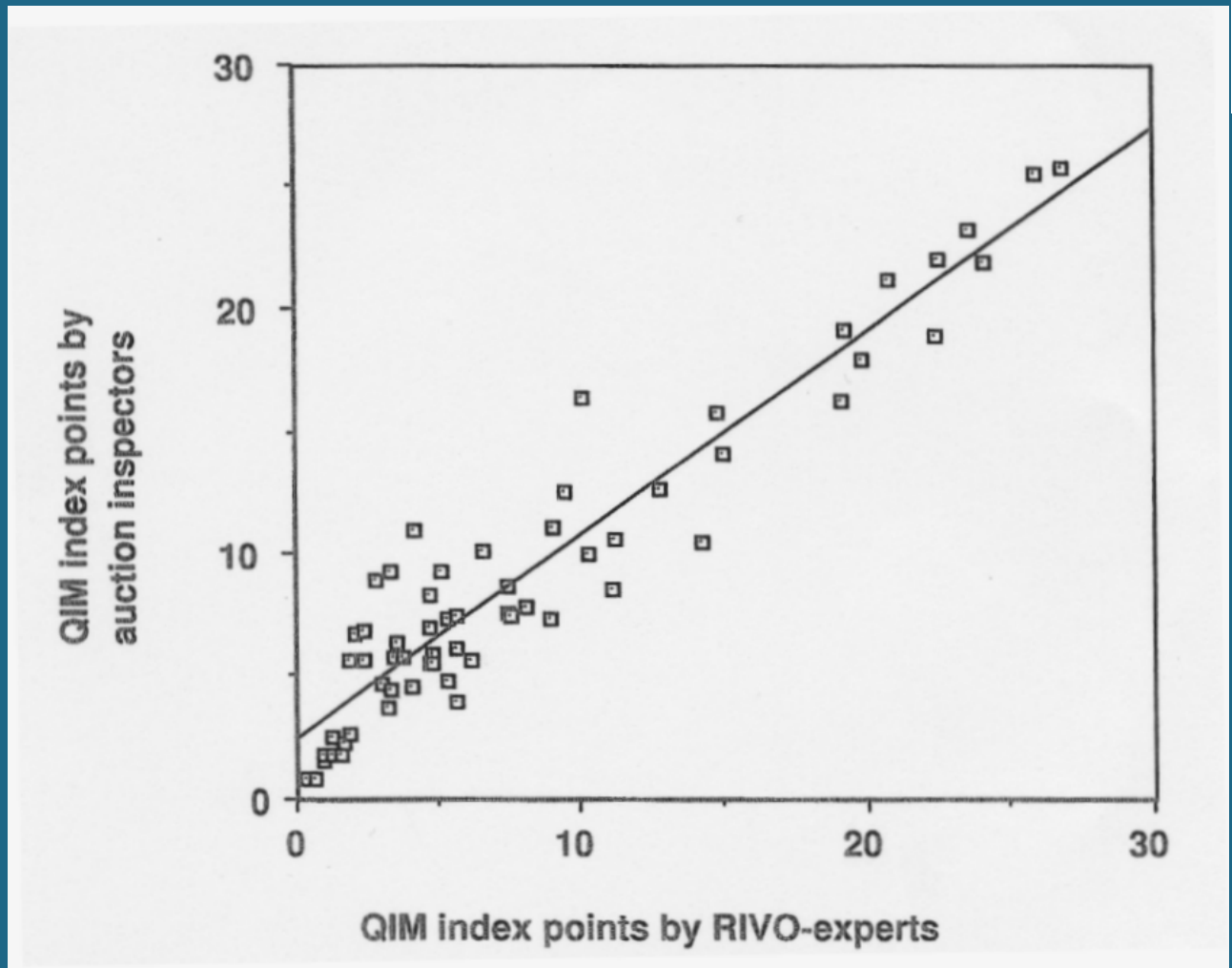
The from fish to dish chain (simplified)



Training

- In Belgium (Flamish United Fish Auctions (Zeebrugge, Oostende and Nieuwkoop), the Netherlands (United Fish Auctions (Stellendam, Scheveningen, Colijnsplaat) and Iceland about 50 employees have been selected and trained
  - interview candidates (attitude)
  - odor identification test (approx 30 odors) and color blindness test
  - QIM principle
  - 6-8 intensive training days for 1-2 selected species according learning by doing principle
  - “examen” by assessing fish of (un)known quality
  - certificate valid for limited period
  - retraining with 1-2 year

Trained QIM inspectors versus QIM experts



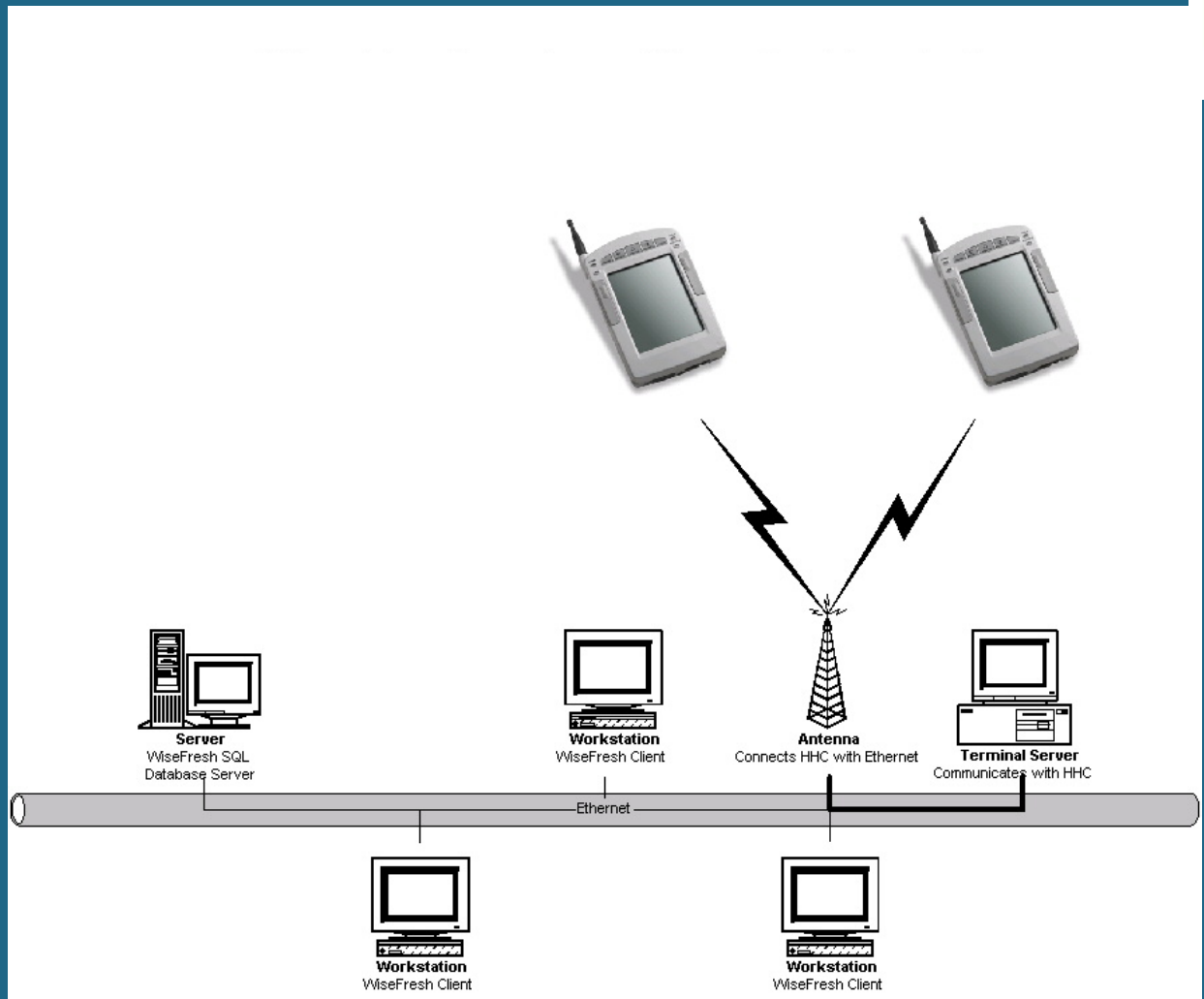
Software

- Software developed for QIM assessment
  - in English, Icelandic, Dutch and Danish
  - training modules
- QIM schemes and calibration curves for important European fish species
  - plaice, turbot, sole, brill, dab, cod, haddock, red fish, pollock, (farmed) salmon, 3 types of shrimps, herring, Norwegian lobster
  - available on web www.qim-eurofish.com
  - standardised photographs available of gills, skin, eyes
- QIM manual available (QIM-Eurofish)
  - in English
  - in 8 other European languages in period 2003-2004

System (at United Fish Auctions, NL)

- Wisefresh (software package QIM) with handheld instrumentation in implementation phase

Wisefresh setup of handheld solution



QIM assessment requirements

- minimal 3 and maximal 5 samples per batch (in terms of traceability)
- assessment batch preferable by 2 inspectors
- no significant effect of season on QIM curve

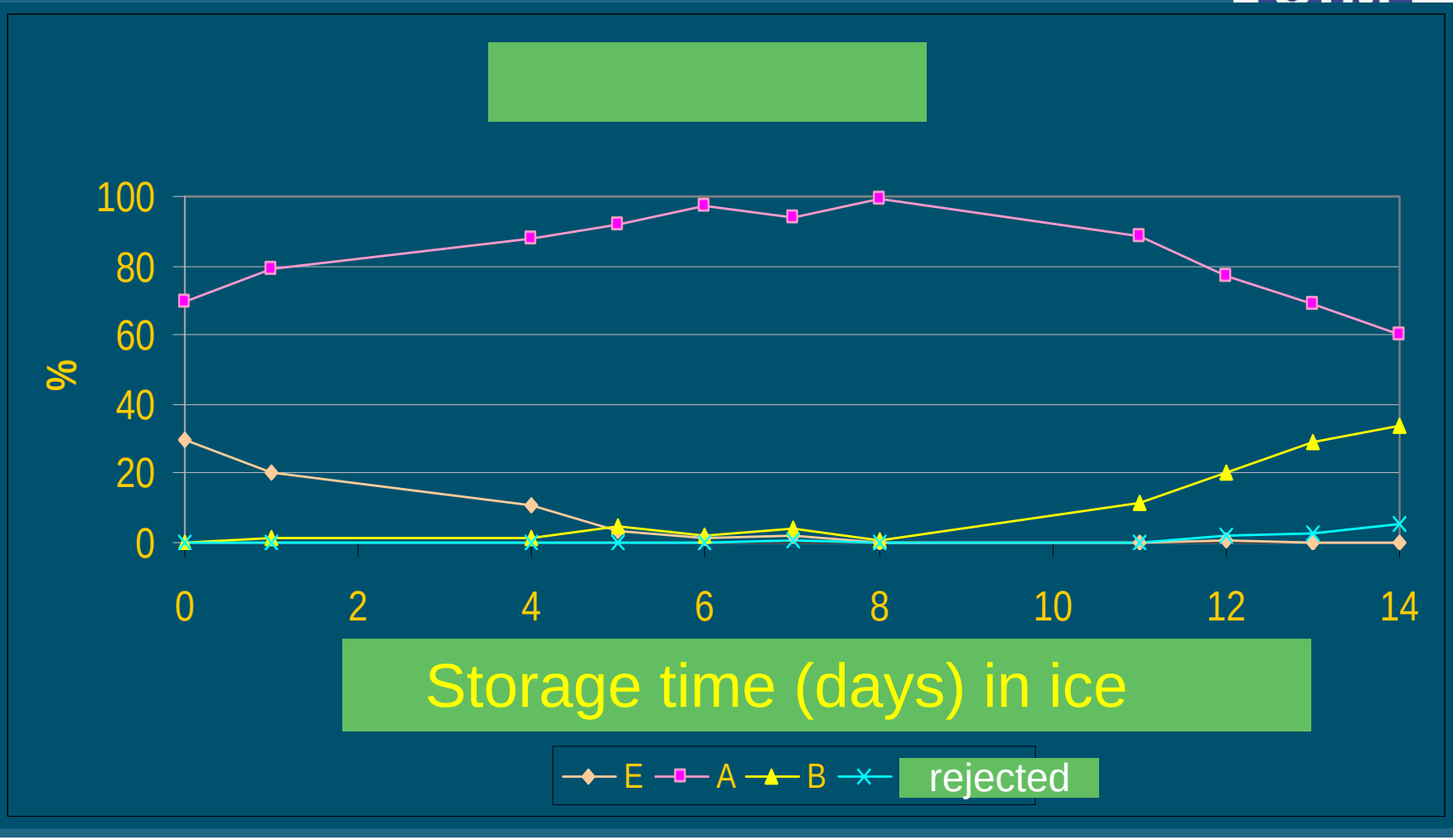
QIM and the EU marketing standards

- Dutch Board for Fisheries (PVis)
  - responsible for grading landed fish according EU marketing standards
  - in about 10 auctions in the Netherlands quality is assessed by approx. 20 inspectors on basis EU grading system
  - “complaints” from the market
    - all fish has A quality
    - need for more quality classes (E, A+, A, A- and B)
  - how can we link QIM to EU grading system and develop a revised system on basis of QIM?

QIM and the EU market standards

- PVis EU inspectors
- QIM experts RIVO
- Various batches of plaice, processed on board of vessels under GMP conditions, were selected and stored on ice
- Each PVis inspector assessed 15 fishes according EU grading system and QIM experts according QIM procedure
- Each fish was assessed by a maximum of 6 inspectors

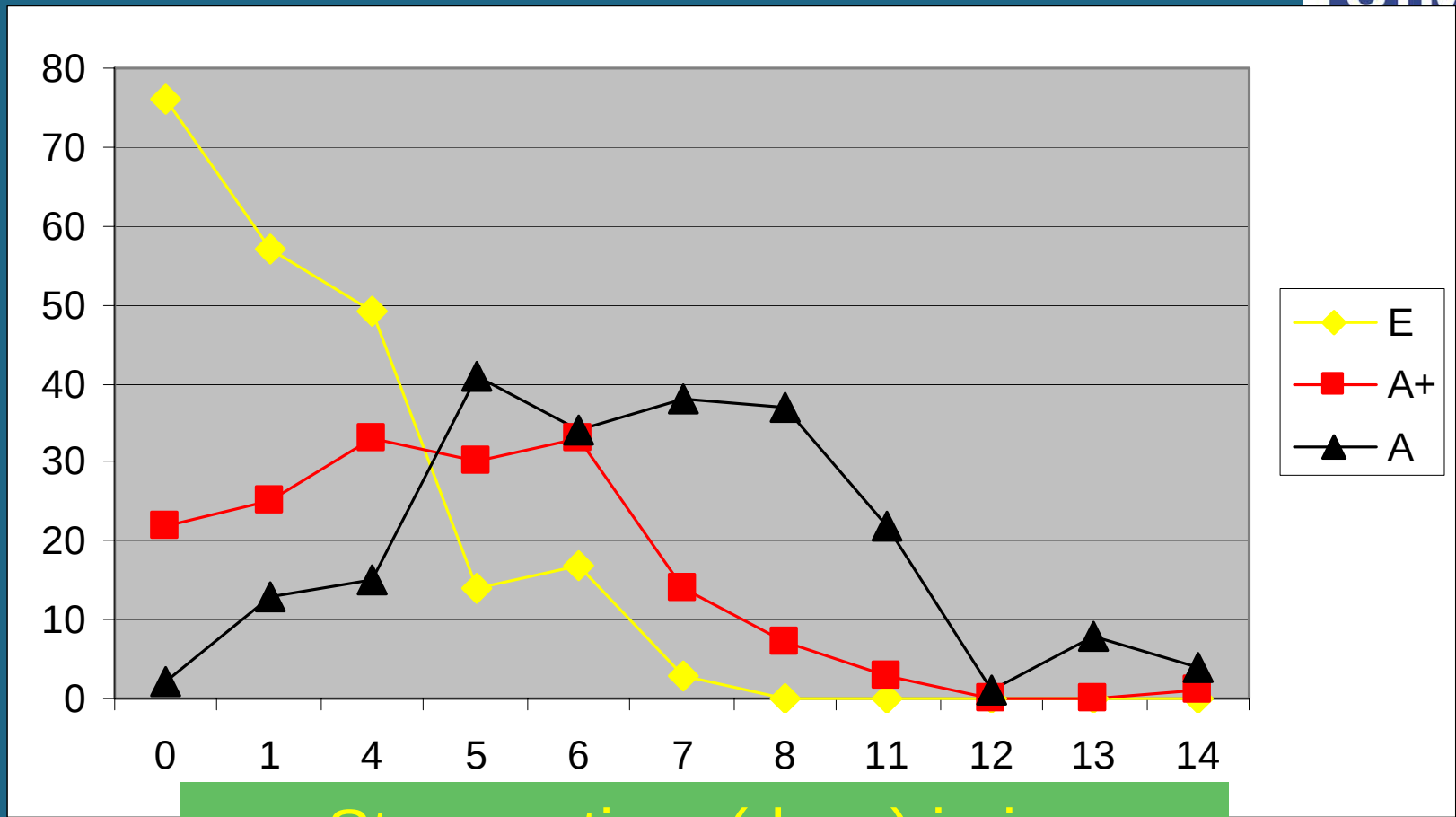
Distribution over EU classes plaice during storage



Proposed QIM score for plaice to establish EU grade

QIM score	EU grade
0 - max 5	E
>5 - max 9	A+
>9 – max 13	A
>13 – max 16	A-
>16 – max 21	B
>21	Rejected

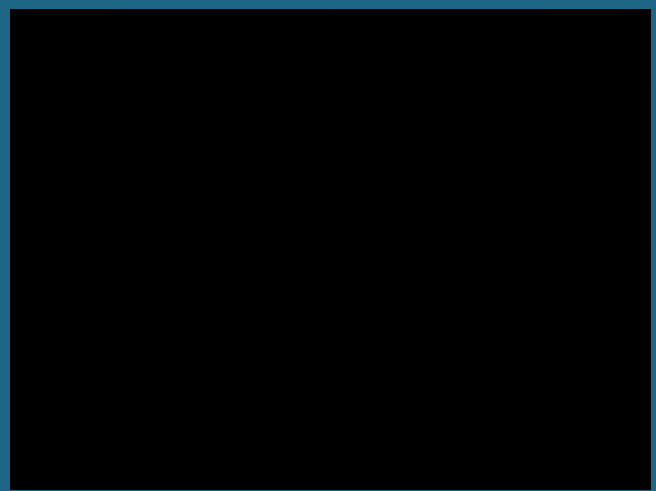
Distribution of refined EU classes of plaice on basis of QIM



FAQ about QIM

- Time consuming?
  - Answer is NO, QIM will not take more time than EU grading
  - QIM may even be faster (hand held instrumentation) and traceable!
- How about training programme for QIM?
  - Qualified training programmes, workshop etc can be giving at any location in Europe.
  - No training programme for EU grading are known.

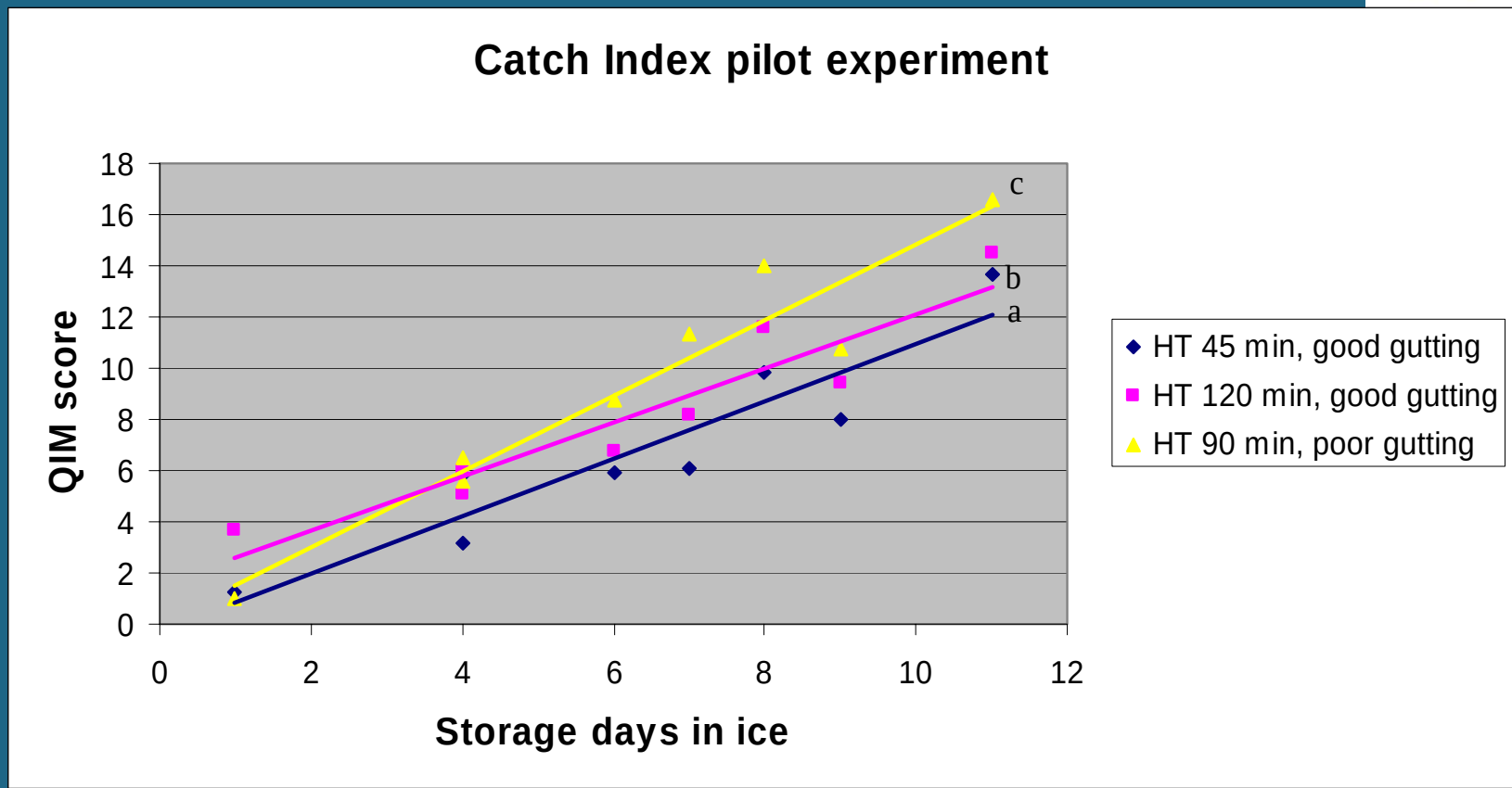
QIM in practice at auction Scheveningen (video)



Future

- Developing Product(filet)-QIM and Consumer-QIM
- Developing CatchIndex concept
  - QIM as control check point
- QIM in Morocco
  - FAO project for QIM Eurofish (2003)
- Approx. 10 new QIM schemes to be developed in Belgium (2003-2004)
- QIMCHAIN
- QIM promotion tour in United Kingdom and Ireland (2003)
- QIM Network
- Two QIM workshops (Spain and UK)

CatchIndex concept



Conclusions

- QIM for quality (freshness) grading, as an alternative for the existing procedures EU grading, has many advantages.
- QIM fits very well into the ICT approach of partners in the chain, into the concept of tracking & tracing and the market for more traceable quality differentiation
- Tools for QIM and the network for a successful implementation of QIM are available
- Implementation of QIM (at the first point of sale) would be stimulated if the EU grading in the Council Regulation (2406/1996) would incorporate QIM as grading system

Project management meeting of QIMCHAIN in Brussels on Nov. 11th 2002
Emilía Martinsdóttir, Grethe Hyldig, and Joop Luten

1. Poster
A poster was made to use at the exhibition in Brussels. It will be sent as a power-point document to all partners for their use at other meetings and exhibitions etc. It can be printed out as 70x100cm poster or as A4 handout. It will also be at the homepage for printing.

2. Work-packages planning-time- schedules
All work-packages were discussed and planned for the coming months

WP1 QIM Network-Platform
It was decided start forming the platform by focusing on the people who could use the method. The first plan is to contact Britain in the beginning of 2003. Make a list of all British and Irish interested people and companies.
Grimsby Hull colleague of Cliff Morrison, Seafood Industry Authority
Ireland Ian Lawlier
Jack Vader
Emilia will send the list of buyers of reference manual to Joop
Retailers. *Added by Emilia: I know Marks and Spencers quality managers are having courses in basic sensory evaluation given by Campden.*

New schemes are under development :
Peter Bossier in Belgium (co-operation RIVO 12 species?)
Dorrita Nielsen is developing Hybrid Striped Bass in Davis Allan Bemner has contacted the management and told us that he has put up a strategy plan for using a Quality Index in Australia through Seafood Services Australia (www.seafoodservices.com.au which is supported by the Fisheries Research & Development Corporation www.frdc.com.au and industry). There will be sought for
funding for a pilot study on a limited number of species (6) different species. Joop will sent a letter to Allan

WP2 QIM Workshop (key-users)
1. Workshops It was suggested that the first workshop should be held in Spain in collaboration with AZTI and IPIMAR. Grethe will contact Begona and plan in more details: Location, species (use existing schemes), time and how to contact participants. (how,when and where).
Joop will collect information in UK for the interest of having the second workshop there.

2. Key-users
All partners are encouraged to contact their key-users) Please send information to Grethe and Emilia of how and when they will contact their national key-users

Participant	Key-user	Type of company	Key-user contact person
1. IFL	Utgerdafelag Akureyringa (ÚA), Akureyri, Iceland	Fish Processing Plants	Gunnar Örn Kristjánsson

	Sildarvinnslan, Neskaupstadur, Iceland		Asbjorn Helgi Arnason
2. RIVO	Ouwehand's Rederij en Visverwerking B.V. Lageweg 55, 2220 CA Katwijk (ZH) Gebr. Sterk B.V., P.O box 13, 8531 AA Lemmer.	Producer Exporter Producer Exporter	Mr. H. v.d. Weide. Mr. A. van der Sluis
3. DIFRES	The Danish Association of Trout Farmers The Danish Association of Smokehouse Owners		Villy J. Larsen Brian Jensen
4. BFAFi	Deutsche See GmbH & Co KG Klussmannstraße 3 D-27570 Bremerhaven Bundesmarktverband der Fischwirtschaft e.V. Große Elbstraße 133 D-22767 Hamburg	Producer Exporters	Frau Dr. Koch Dr. Keller
5. NIFA	Norfra AS Strandveien 106 N-9292 Tromsø Norway Måløy Fiskeindustri AS N-6701 Måløy Norway	Exporter Producer	Jan Karlsen (Quality Manager) Tone K. Harnes (Quality Manager)
6. IPIMAR	Modelo, Continente Hipermercados, S.A. Lisboa DOCAPESCA, delegação de Lisboa Lisboa	Supermarket	Lara Castelo Branco Humberto Carrapato
7. AZTI	Producer: Asociación de armadores de Altura de Pasajes Exporter: Pescados Oliveri, S.A.	Producer Exporter	Martín Aguirre José Antonio Oliveri

WP3 QIM reference manual

All partners are requested to send to Emilia time schedule for the translations of the manual to their respective language for better planning of printing of the manuals. Each partner will receive 25 copies of the manual in their own language.

Extra copies will be printed and sold by QIM-EUROFISH.

A sentence about copyright needs to be added to the manuals.

Requests on QIM-schemes from Finland and Sweden about use in teaching will be answered by Joop

WP4 QIM Dissemination at fish exhibitions
Rian has collected this information and will give a report

WP5 QIM Articles in fish trade journals (forum for the articles)

Partners IFL,RIVO and DIFRES must write articles about QIM and the developments about QIM. These articles must be published in international industry oriented and popular journals. These articles must then be translated into the languages of all partners in the project and published in national fish trade journals. Also, partners from the network must be involved in the distribution of these articles into journals they are familiar with.

Emilia has on request of European Sensory Network written in English a very short article which was edited by a journalist and then translated into German and published in Food Ingredients Sensorik Ausgabe October 2002. This will be sent to all partners to translate or use as a basis for national articles. Grethe is writing an article about QIM (in Norsk Sjømad and Fisk og Hav) and will distribute to all partners for the same purpose.

Grethe will contact Seafood International

WP6 QIM web-site (comments from Achim)
The web-site has been commented by our contact in Brussels Achim Boencke and we have been requested to create links to EU-web-sites etc. Joop will take care of this in collaboration with our web-master.
Also a forum will be put up on the web-site for all dissemination activities (articles, workshops, lectures, meetings exhibitions etc.
Emilia will ask Olafur for information of the status and actual situation of WiseFresh and about possible more information or ordering of the programme on the web-site.

Meeting of all partners
Mid-term meeting for all participants should be held in second half of next year and it was suggested to held it in combination with another event like the one of the workshops so the participants had opportunity to be there. If one of the workshops would be held in UK maybe September next year the meeting could be held there.

2. Consortium agreement
We have to sign a consortium on the management and execution of the project as soon as possible. Emilia will send a consortium agreement to all partners for signing.

Project meeting of QIMCHAIN
Held in Reykjavik during
First Joint Trans-Atlantic Fisheries Technology Conference (TAFT)
33rd WEFTA Meeting and 48th Atlantic Fisheries Technology Conference
11-14 June 2003, Reykjavik - Iceland 2003

Participants:
Emilía Martinsdóttir and Kolbrún Sveinsdóttir, IFL
Joop Luten RIVO
Grethe Hyldig DIFRES
Stella Jónsdóttir MARITECH
Begoña Pérez-Villarreal AZTI
Jörg Oehlenschläger BFAFi
Heidi Nielsen, NIFA

The progress of the first year was discussed:

Overview over the activities already performed was discussed:

WP1. QIM Network-Platform

FAIRFLOW-meeting, 25, Oct, 2002, Reykjavik, Iceland
Lecture: Harmonised sensory methods for evaluation of fish freshness in Europe
Presented by: Emilía Martinsdóttir, Icelandic Fisheries Laboratories

European Sensory Network Seminar: Using sensory analysis in food product development and quality control
21-22 November 2002, Budapest, Hungary
Lecture: Case study- Computerised sensory data sampling in the quality management and e-commerce of fish
Presented by: Emilía Martinsdóttir, Icelandic Fisheries Laboratories

Poster at SEAFOODplus workshop at European Research 2002, Brussels 11-13 November 2002
a poster about the QIMCHAIN project was presented by Emilia Martinsdottir, Icelandic Fisheries Laboratories at the SEAFOODplus workshop

International Quality Retail Conference November 2002

Baltic Region Quality Fish Forum, April 10-11, 2003 in Pori (Finland)
Lecture: Fish Quality and Standards Presented by: Grethe Hyldig, Danish Institute for Fisheries Research

TAFT 2003 a poster about the QIMCHAIN project presented by Emilia Martinsdóttir, Icelandic Fisheries

QIM introduction courses January-February 2003

In January and February 2003 four one-days courses to introduce the QIM-method for quality managers in Icelandic fish auctions have been held. During each course lectures were given and practical sessions with demonstrations on the use of the method. The courses were managed by Emilía Martinsdóttir, Kolbrún Sveinsdóttir and Ása Thorkelsdóttir, IFL

Joop Luten presenting QIM at DGXIV-EAPPA meeting May 5th 2003

Schemes are presented at the web-page

Britain next step:
Rian and Joop Our QIM tour plans in UK and Ireland

Friday 20 June at BIM (Dublin, Ireland) for QIM mini workshop (principles QIM, software demo, QIM Eurofish (including videofilm TV broadcasted QIM at auction Scheveningen') for BIM staff and discussion QIM implementation experiences Monday 23 June morning discussion on QIM activities at SFIA, cooperation SFIA-QIM Eurofish, software development Monday 23 June afternoon at Youngs Bluecrest for QIM mini workshop (principles QIM, software demo, QIM Eurofish (including videofilm broadcasted QIM at auction Scheveningen'), hands-on demo QIM) for Youngs Bluecrest staff (to be confirmed),
Tuesday 24 June early morning QIM hands-on demo at Fishgate (auction Hull) Tuesday 24 June afternoon mini QIM workshop (QIM principles, software demo, QIM Eurofish (including videofilm 'QIM at auction Scheveningen') at Fishgate

Complete programme will be published on website QIM Eurofish.

WP2: QIM Workshop (key-users)
Discussion on the 2 workshops planned within the project. Begona informed of lack of motivation in Spain for such a workshop. It was decided to wait for the results of the UK-tour to decide if Britain would be a good choice for a workshop. Also France was mentioned as a good choice. The French translation of the manual will however not be completed until February. The Baltic countries were mentioned as an optioned.
The participants were encouraged to contact the key-actors in their respective countries.

WP3 QIM reference manual
The Danish and Dutch translations have been received. The Portuguese and Spanish versions are finished but have not been sent in.

WP4 QIM Dissemination at fish exhibitions
WP 4: QIMCHAIN has been presented in following exhibitions in some way or another):

QIMCHAIN
Presentation at Icelandic Fisheries Exhibition IFL and Maritech
- Glasgow (April 2003): QIM leaflets, no booth but RIVO people walking around.
- Polfish (27-29 may 2003): QIM leaflets and poster, presented in booth
- Brussels seafood exhibition (May 2003): Maritech- European Seafood Exposition and Seafood Processing Europe 2003 May 6-8th 2003, leaflets were presented at the booth of Maritech

- Aqua nor Trondheim (12/15-8-2003): Decided that NIFA should take care of this presentation
- BIM-Irish Seafood expo (10/11-9-2003): No arrangements have been made Joop and Rian will ask during our visit if there are possibilities to present something there and how they look at a workshop during the exhibition.
- Vigo (17/21-9-2002): It was not clear who will be present... Grethe will look into this.

Bremen (12/15-2-2004): Eventually WEFTA has a booth and we can present QIMCHAIN like previous Bremen expo.

WP5. QIM Articles in fish trade journals (forum for the articles)
Already published:
How fresh is your fish?
Emilía Martinsdóttir, Icelandic Fisheries Laboratories, Food Ingredients Sensorik, Newsletter, Behr´s Verlag Hamburg , Germany, October 2002

Evaluation of fish quality at fish auctions in Iceland
Emilía Martinsdottir and Bjarni Askelsson (Federation of fish auctions) Aegir 96, 4 2003 30 - 33

WP6. QIM web-site
It should be reported how many visitors have been at the web-site.

The end of the first year of the project is August 1st. 2003 and the participants were reminded of the cost statements and progress reports to be delivered in August.

Planning of the second year

Meeting of all partners would be most effective if it could be held in connection with one the workshops. Time and place was not decided.

Reykjavík, June 20th 2003
Emilia Martinsdottir