

IFL Project Report
08 - 04



Icelandic Fisheries
Laboratories

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**INTRODUCTION OF THE QUALITY INDEX METHOD (QIM)
IN THE EUROPEAN FISHERY CHAIN (QIMCHAIN)
FINAL REPORT 2002-2004**

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

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Ágrip á íslensku:	Skýrsla þessi er lokaskýrsla í verkefni sem fólst í því að fólst 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. Í verkefninu hefur QIM verið kynnt á tíu sjávarútvegssýningum í Evrópu, greinar skrifaðar í blöð og tímarit, handbók um skynmat á ferskum fiski hefur verið gefin út 10 tungumálum og reynt hefur að skapa umræðu um ferskfiskmat með þáttöku á fundum hjá hagsmunaaðilum. Haldin voru tvö námskeið fyrir gæðastjóra í fiskiðnaði á Spáni og Bretlandi og alþjóðleg námsetfna í Brussel. 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. Multilingual guidelines and reference manuals for end-users has been translated and published in 10 languages. The QIM method has been demonstrated by participation at several important European fish exhibitions. Articles in international industry orientated, and consumer oriented journals and in national journals have been written. Two workshops for quality managers have been held, one in Spain and one in the UK and an international QIM-workshop held in Brussels. The existing QIM-schemes in English are now published on the web-site(www.qim-eurofish.com)		
English keywords:	QIM, Fish, Sensory, Quality, Freshness		

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PROGRESS REPORT

Title of the project: Introduction of Quality Index method (QIM) in the European Fishery Chain		
Acronym of the project QIMCHAIN		
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1. August 2002	1. August 2002 – 31. July 2004	
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World wide web address (the project's www address) www.qim-eurofish.com		

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All partners are contractors

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1. CONSOLIDATED FINAL 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, in order 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 the most important fish species

This objective must be achieved through several sub-objectives:

To create and establish a QIM network-platform for partners in the fishery chain, authorities and scientists. Emphasis must be on active participation on behalf of fishermen, auctions, processors and retailers (including supermarkets). Regional and international (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. Existing key industrial key end-users of QIM 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 a national and European level.

Creation of a web-site with detailed information on QIM.

1.2. Description of work

The QIM-network has been launched both at meetings which have been organised and planned by the participants in collaboration with stakeholders and also by participating in meetings planned and organised by others. A European network has been formed. The network consists of all the partners from the project and other relevant key actors in the fishery chain, authorities and scientists from the various European countries which are interested in implementing QIM.

Discussions about QIM have been carried out at various conferences and workshops, both for researchers and the fishing industry, to identify the needs for further research in this field, in order to monitor various different views. In addition, authorities in Brussels have been kept informed. Two workshops aimed for the fishing sector were held, one in Spain and one in the UK, both included lectures and practical demonstration. The training of staff at fish auctions in the UK and various small workshops have been undertaken. The usefulness and effectiveness of QIM for improving fish quality was demonstrated at ten major European fish exhibitions. The partners of QIMCHAIN very actively participated in the Brussels Seafood Exhibition in May 2004 and a QIM-workshop was held for members of the network and other participants at the exhibition.

The translation and printing of a reference multilingual manual for education, training and easy application of QIM in the fishing sector 10 different languages was finalised and sent to all project participants and subcontractors. The manuals were delivered to the representative of the EU-Commission.

Twelve articles or information sheets on the QIM method and the possibilities of using the method have been published at a national level and one article in an international magazine. Five scientific papers were prepared, submitted and accepted for publication. One chapter has been written in a book which will be published later in the year 2004.

A web-site offering up-to-date information about QIM and the status and the possibilities of using QIM was created and maintained from the beginning of the project. The web-site contains various information about the project, its status, progress and other relevant information. It is important that the web site has been an active forum for the QIM network.

1.3. Results and deliverables

All results and deliverables from individual work-packages are found later in the report in more detail.

Main conclusions

The development of a QIM platform made up of scientists and a network for partners in the fishery chain and authorities has made a considerable progress in 2003-4 with a new or stronger involvement from various partners, the fishery chain and scientific institutes. The platform with more than 200 'members' interested in QIM, as well a newsletter has been established and the continuation of the platform, newsletter and website is guaranteed by the QIM Eurofish alliance.

The numerous visits to companies and auctions and participation in meetings with stakeholders in the fishery chain have resulted in an open discussion on the advantages and disadvantages of the use of QIM for the evaluation of fish freshness.

There seems to be a need in the fishery chain to also include other factors in the classification of the quality of landed fish besides 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. A stimulation of further implementation of QIM as a reference method for evaluating fish freshness of seafood (products) is still needed. Two main issues have to be addressed: intensive training of quality employees of fishery partners in Europe

and how to handle large amounts of landed fish in a cost efficient way (within a reasonable time with the available manpower).

At the workshop in May 2004 in Brussels an extensive overview of the status of the use of QIM was given. A quality manager from a fish auction in Belgium having been using the QIM for 2 years, gave an overview over the practical value towards the purchaser, the fisherman and the auction. The manager stated that the European freshness classes E, A and B represented an enormous variation in freshness, the assessment with QIM was a more accurate for predicting the shelf-life of a batch. The experience of the auction, which can be regarded acting as a pioneer in the promotion of fish trading over the internet, is that assessment by the QIM method facilitated this kind of trade. Also by using QIM the auction attracted an important number of purchasers buying over the internet. To local buyers, it's a tool to check their own findings when they make a choice what fish to buy. The important factor in the trading of fresh fish as showing the buyers the freshness stage of the landings turned out to have added values. Competition between fishermen was encouraged and was shown to upgrade the quality of the landed fish at the auction. The confidence of the purchaser was strengthened. The main conclusion was that the freshness evaluation by QIM is a valuable tool with an added value. This tool can promote fish auctions as a place where transparent trade is promoted and where a maximum of information is made public. As quantity is not an option any more, today fresh caught fish is promoted as high quality food. One of the major obstacles for correct evaluation of a batch as a whole is that in some countries the different parts of the catch (i.e. catching days) are not being kept separately. Buyers and sellers using the same language when speaking of the freshness of fish will minimize complaints.

The general conclusion from discussion with the Icelandic auctions 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 a key element in the quality assessment of fish by the consumers. Fish is very perishable and has a 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 the production of high-quality food today, more detailed information is needed on the quality of the raw materials and products. Information on the freshness of the raw materials and products must be essential for production and quality management. 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.

Fish auctions in the Netherlands, Belgium and in the UK have started to use the method on a daily basis to provide their customers with information on quality. Fish auctions in Iceland have shown a growing interest in implementing the method. The method is now used for training of quality inspectors in the fish industry in various European countries like the Netherlands, Belgium, Norway, Iceland, Denmark and the UK. Workshops, aimed for the fish sector in selected European countries, have been held. A number of quality managers in fish processing companies, auctions and retailers in Europe have now the knowledge to start implementing QIM in their operations.

The validated QIM methodology for 12 fish species in a multilingual reference manual for end-users and software in totally 11 European languages is already available. The fish industry in the different countries has now access to this information in its own language. The partners of the project received several copies for dissemination of the information on QIM in their own countries..

The manuals in all languages will be available via the QIM-Eurofish web-site in the future. Already over 70 copies have been sold in English to people from all over the world and now orders are coming for manuals in other languages.

The number of QIM-schemes for more fish species is increasing under the supervision of the research institutes as could be seen at the QIM-workshop in Brussels.

The management team of QIMCHAIN will continue as a core network under the umbrella of QIM-Eurofish for stimulation and coordination of QIM activities. The information has spread to numerous European and other countries through the seafood exhibitions which are visited by people from all over the world.. The number of scientific articles where the QIM is used as part of the methodology or as a reference method is growing. It has also been very important to publish information in national papers for people in the fish chain in each country. A web-site used as an active platform for the network is receiving numerous visits daily.

Widespread knowledge about QIM for evaluating fish freshness has 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 has been enhanced. There is a growing awareness of the benefits of using standardised methods for evaluating fish freshness in Europe. There is now an increased implementation and practical application of QIM in the European fish sector.

1.4. Dissemination of research results

During the progress of this Accompanying Measure project a huge dissemination has taken place as can be seen from the following list:

Diverse meetings and visits

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)

Meeting with EAFPA European Association of Fishing Ports and Associations in December Dec. 2nd 2003

Meetings with RIVO and the Netherlands Organisation of Auctions NOVA/Pvis 21 of April 2004.

Name of the presentation: Differentiatie in kwaliteits klassen en prijsvorming van aangevoerde vis op afslagen door introductie van QIM-scan Lecturer Joop Luten (RIVO)

Meeting with the staff at the Icelandic Directorate of Fisheries April 5th 2004

Name of the presentation: Status of the QIMCHAIN-method in Europe *Lecturer:* Emilia Martinsdottir (IFL)

Icelandic fish companies and Belgian retailers in Iceland in June 2004

Name of the presentation: QIMCHAIN-method in assessing the quality of fish *Lecturer:* Emilia Martinsdottir (IFL)

Collaboration with DVZ Oostende regarding the development of 12 QIM schemes for new species in Belgium. Within this project. RIVO assists in validation and advice. Visit to Oostende Fishauctions. 11-12-2003

Collaboration with Youngs Bluecrest UK Close contacts are made with Youngs Bluecrest UK for the development of a QIM scheme for Norway Lobster Tails.

Courses for the smokehouses in Denmark in using QIM for salmon

Visits to fishmongers all over Denmark for information on use of QIM.

Presentation and demonstration on QIM at a workshop for Royal Greenland.

Lectures given at:

Baltic Region Quality Fish Forum,, April 10-11, 2003 in Pori (Finland, *Name of the presentation:* Fish Quality and Standards *Lecturer:* Grethe Hyldig (DIFRES)

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

Name of the presentation: Computerised sensory data sampling in the quality management and e-commerce of fish *Lecturer:* Emilia Martinsdottir (IFL)

International Quality Retail Conference November 2002 ,Hamburg, Germany

Name of the presentation: What is fresh fish? The Quality Index method (QIM) gives the answer project *Lecturer:* Joop Luten (RIVO)

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

Name of the presentation: harmonised sensory methods for evaluation of fish freshness in Europe *Lecturer:* Emilia Martinsdottir (IFL)

QIM-Workshop in Vigo Spain January 26th-27th 2004

Name of the presentation: Sensory Evaluation of Fish *Lecturer:* Grethe Hyldig (DIFRES)

Name of the presentation: Selection and training of assessors for QIM *Lecturer:* Grethe Hyldig (DIFRES)

Name of the presentation: Presentation of the results from the QIM sessions *Lecturer:* Grethe Hyldig (DIFRES)

All presentations were translated into Spanish

International QIM workshop in Brussels on the 5th of May during the Seafood exhibition.

Name of the presentation: Progress of the QIMCHAIN project *Lecturer:* Emilia Martinsdottir (IFL)

Name of the presentation: New QIM schemes (1: lemon sole, stingray, dogfish, red gurnard, pout, crangon crangon, scallops, monkfish 2: maatjesherring, Norwegian lobster 3: dab, flounder, frozen hake, trout) *Lecturer:s* 1: Karen Bekaert (FRS), 2: Rian Schelvis (RIVO) and 3: Grethe Hyldig (DIFRES)

Name of the presentation Wisefresh QIM software 'Future developments' *Lecturer:* Halldór Lúðvíksson (Maritech)

Name of the presentation: Quality characteristics for selling fish via the internet. *Lecturers:* Jack Vader (ID-Fish) and Paul de Niet (PVis) on behalf Dutch National Auction Organisation

Name of the presentation: QIM in auction practice *Lecturer:* Philippe Maryssael (Auction Zeebrugge)

Name of the presentation: Improved seafood sensory quality for the consumer *Lecturer:* Kolbrun Sveinsdottir (IFL)

QIM-Workshop at Billingsgate market in London, UK, June 21st-22nd 2004

Name of the presentation: Introduction of the status of QIM in Europe *Lecturer:* Emilia Martinsdottir (IFL)

Name of the presentation: Sensory evaluation and how to build a QIM-scheme *Lecturer:* by Grethe Hyldig (DIFRES)

Name of the presentation: Selection and Training of inspectors *Lecturer:* Rian Schelvis (RIVO)

Nordic Workshop in Sensory Science-Advanced Sensory Tools for Improved Products, 6-8 May 2004, Turku, Finland

Name of the presentation: QIM-Method in assessing the quality of fish *Lecturer:* Emilia Martinsdottir (IFL)

Fisheries Training Programme of the United Nations University October 2003

Name of the presentation: sensory Evaluation of fish *Lecturer:* Emilia Martinsdottir (IFL)

Publications

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4. E. Martinsdóttir, "Þarf að meta ferskleika fisks". Aegir , 2004, 7, p. 14 to 17.
5. Emilía Martinsdóttir and Bjarni Askelsson (Federation of fish auctions). Evaluation of fish quality at fish auctions in Iceland . Aegir 96, 4 2003 30 – 33
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14. Nielsen D and Hyldig G. 2004. Influence of handling procedures and biological factors on the QIM evaluation of whole herring (*Clupea harengus* L.) Food Research International. In press.
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16. R. Schelvis-Smit, "QIM geeft info over kwaliteit in hele visketen". Visserij nieuws, 7 mei 2004, p 10.
17. Rf-Report Sensory Evaluation of Fish Freshness by QIM-method. Emilia Martinsdóttir, Kolbrún Sveinsdóttir, Ása Thorkelsdóttir and Bjarni Askelsson Icelandic union of Fish Auctions
18. Rian Schelvis. Kwaliteits Index Methode: De beste manier om de versheid van vis te bepalen. Vleesindustrie Januari 2003 (18-19).

19. Schelvis-Smit, A.A.M and J.B. Luten., 2003. Catch Index: Development 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. Oehlenschläger, G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

Through the QIM-Eurofish website, “Cuán fresco está el fresco? Revista Redes, de la industria pesquera Argentina”. N° 135 mar/abr 2004. p80-84.

Demonstrations

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

The First Joint Trans-Atlantic Fisheries Technology Conference (TAFT)-33rd WEFTA Meeting and 48th Atlantic Fisheries Technology Conference, 11-14 June 2003, Reykjavik - Iceland 2003-2.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

Aquanor Trondheim (12/15-8-2003): presentation of QIM-Eurofish brochure by Fiskeriforskning and Wisefresh brochure by Maritech.

BIM-Irish seafood expo (10/11-9-2003): 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): Participation of QIMCHAIN in the WEFTA booth. Posters, presentation of QIM-Eurofish brochure and demonstration of software by RIVO, BFAFi and IFL

European Seafood Exhibition Brussels 4-6 May 2004. Presentation of QIM manual in 11 European languages. Demonstration of QIM-software and handheld device. Several posters with information on QIM.

Demonstration of QIM-software and handheld device at QIM-Workshop at Billingsgate market in London, UK, June 21st-22nd 2004 QIM-Workshop in Vigo Spain January 26th-27th 2004

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 the First (September 2003) and Second (September 2004) Consolidated Progress Report as Appendices

1.5. Future actions

It is urgent for the fish auctions and fish industry to continue the implementation of QIM. Consumers will be demanding more information about food products. It must be of great importance for the fish auctions and trading of fish to have a common method giving unique information on the quality. Also for an effective quality and process management in production of high-quality fish product. Implementation of the methods in various parts of the fishery chain will give guidelines for further research and development of QIM for more important fish species.

Standardised method for evaluation of fish freshness in Europe will facilitate communication between buyers and sellers of fish and fulfil demands of inspection authorities and regulations. It

will 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.

There seems to be a need in the fishery chain to also include other factors in the classification of the quality of landed fish other 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. Stimulation of further implementation of QIM as reference method for evaluating fish freshness of seafood (products) is still needed. Two main issues have to be overcome: intensive training of quality employees of fishery partners in Europe and how to handle large amounts of landed fish within a reasonable time with available manpower. QIM Eurofish and the network developed with QIMCHAIN want to play an active role by submission of a project with the following aims:

to stimulate further exploitation of the QIM methodology with focus on an integrated QIM training programme in a number of selected innovative partners in the fishery chain (auctions, fish processors) and to stimulate the use of C-QIM by consumers

to develop an appropriate logistic QIM evaluation procedure for evaluating fish freshness of landed fish within a short time frame.

Therefore the development of a tool (QIMscan) embedded in the developed QIM as the reference method is needed. QIMscan could become the possible intermediate between the QIM standard (evaluating all attributes for full characterization of freshness) developed now and the very simple (only a very few attributes) C-QIM developed for consumers.

At the fish exhibition the representatives from the fish industry in Eastern Europe have expressed interest of translations of the reference manuals to more languages. The possibilities for funding in this area will be investigated. Within the period of this project fish research institutes in Europe after requests from the industry (Belgium) have been developing new schemes for more fish species. It is still needed that such development is coordinated regarding the quality of the scheme and with the aim of buyers and sellers all over Europe use the same standardised methods.

The fish industry does not seem to want new regulations on estimating quality of fish. However a recommendation from the European Commission for the buyers and sellers of fish to use the Quality Index Methods would speed up the implementation of the method.

More newsletters will be published by QIM-EUROFISH. All network participants will be sent the newsletter and contacted when news appear on the homepage.

The website will 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 a QIM network-platform for parties in the fishery chain, 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.

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

2.2. Description of work

All information about dissemination's activities has been put on the website in order to inform all members of the network. Knowledge about QIM for evaluating fish freshness has 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, has been enhanced and the awareness of the benefits of using standardised methods for evaluating fish freshness in Europe has increased.

In a systematic way key actors in the chain with emphasis on, fish auctions in the various countries were approached by the members of the project.

All the research organisations are members of WEFTA (Western European Fish Technologists Association). Researchers in Europe were informed at annual WEFTA-meetings in 2003 and discussions encouraged to identify the need for further research in the field. Posters were presented at the TAFT 2003 meeting in Reykjavík, Iceland.

2.3. Results and deliverables

Knowledge about the QIM for evaluating fish freshness has been disseminated widely 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 been enhanced and the awareness raised of the benefits of using standardised methods for evaluating fish freshness in Europe.

2.3.1. Forming of the QIM-network and newsletter

Contact information (emails, addresses etc.) on 200 persons interested in evaluation of fish freshness using the QIM method from different parts of the fishery chain, scientist and authorities were collected and a data base with this information was formed. All partners of the project took part in collecting the addresses and all furthermore contacted the key-actors in their own countries. A newsletter was written containing information on the planned international workshop on the 5th

of May in Brussels and the progress of the QIMCHAIN project was sent to all the network 'members' on 22nd of March 2004.

2.3.2. QIMCHAIN tour in Ireland and United Kingdom June 2003

In May 2003, arrangements were made for a QIMchain tour in Ireland and the 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 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. When 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.

2.3.3. Visit to BIM Dublin

The BIM quality team of Ian Lawler, Catharine Barrett and Michael Gallagher were hosting the meeting. Participants, invited by BIM, were from Irish Association of Seafood Companies, Food Safety Authority of Ireland: Marine Department of Communications, Marine and natural resources, Dublin City University, BIM, Castletownbere fishery school and 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. 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 as the QIM method. However BIM also takes the handling aspects (gutting, washing and boxing) into account for a final Quality Assessment Grade. Both aspects freshness and handling, result 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 the need 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.

During the discussion that followed 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 to 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 yet again that it is rather easy to learn the basics behind the methodology in particular for those who have any experience in quality assessment of fish. All participants agreed that QIM is a good reference method for freshness determination.

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. During the meeting Rian Schelvis and Joop Luten and the staff of Sea Fish Industry Authority (SFIA) exchanged information and views on the future possibilities of QIM in United Kingdom. Within SFIA several seafood quality inspectors are involved in quality assessment of seafood in the industry and Adrian Barratt (senior quality advisor of SFIA) is responsible for these activities. SFIA staff is very experienced in using the Torry schemes for quality assessment of fish. 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 was accepted.

November 3-6 2004 Rian Schelvis-Smit trained 13 participants of the staff at Seafood Industry Authority on the QIM method. All participants found it very valuable introduction to QIM. The training was very intensive and gave possibilities for the participants to continue with QIM both at SFIA as well as giving training to the industry.

Fishgate Hull UK is implementing QIM in their auction in 2004. Training and support is given by SFIA UK after RIVO had trained the staff at SFIA.

2.3.5. Visit to Fishgate

Fishgate is the new name for the fresh fish 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, high quality products by the use of modern food processing standards and the latest technology. Remote buying is one of the driving 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 of 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 in the morning and was witnessed 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.

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

2.3.6. QIM chain at the European Seafood Exposition May 5th 2004, Brussels

On the 5th of May during the Seafood exhibition the first international QIM workshop was held and was a success. This workshop offered the unique opportunity for an update about the possibilities of QIM as a tool for evaluating the freshness of seafood. Experiences with the Quality Index Method (QIM) by experts and end-users were presented. The multi-lingual reference QIM manual was officially presented to Isabelle de Froidmont-Görtz DG 12.

On May 4-6th 2004 QIM-EUROFISH presented the QIM-method and the QIMCHAIN project at the

Trade Council of Iceland stand at the European Seafood Exposition & Seafood Processing Europe in Brussels. The European Seafood Exposition is the one major event that brings together seafood-specific buyers and sellers from all over Europe and the world. With over 800 exhibitors from more than 40 countries, ESE offers seafood business professionals access to a one-stop resource to reach the global marketplace. The QIM manual now available in 11 languages English, Dutch, Danish, French, German, Greek, Icelandic, Italian, Norwegian, Portuguese and Spanish was presented at the stand. Visitors from various countries visited the stand and showed great interest, especially if they found that the manual was available in their own language. All the manuals could have been sold at the spot but buyers were instead instructed to visit the homepage for ordering the manual. Many Russian, Polish and East-Europe visitors expressed an interest in buying the manual in their own language.

A practical demonstration on sensory evaluation by QIM-method of salmon of different freshness stages was also given. Use of the hand-held device connected to Wisefresh-software was also demonstrated.

2.3.7. European Association of Fishing Ports and Auctions 2003-2004

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 in April 2003. About 10 representatives from the EAFPA attended this meeting. The EAFPA, chaired by Alain Schlessers, 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 an 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 from the QIMCHAIN project will be invited at the next annual meeting of the EAFPA. A summary of the presentation was sent to several representatives of EAFPA. It is very important to know the needs of 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.

Collaboration continued between the project members (QIM Eurofish) and European Association of Fishing Ports and Auctions. As a follow up of the presentation of the outcome of the Concerted Action 'Fish Quality Labelling and Monitoring' to the European Association of Fishing Ports and Auctions EAFPA in April 2003 during a meeting at DG Fisheries Joop Luten was invited by the EAFPA for a presentation about the QIM activities at their annual meeting in Quimper (France) in December 2003.

Besides the developments on QIM over the last ten years Joop Luten presented the progress of the QIM chain project and possibilities for collaboration between EAFPA and QIM Eurofish. The following options for collaboration were discussed:

- Presentation of a position paper of the EAFPA about quality standards by Alain Schlessner, president of EAFPA at the QIMnetwork meeting at SEAFOOD exhibition 4-6 May 2004 in Brussels.
- Possibilities of a one day hands-on workshop on QIM in 2004 in France in a similar way as it is now organised in Vigo for January 2004
- The possibilities for a future EU project with respect to training of auction staff on QIM assessment. This 'idea' will be worked out in 2004

2.3.8. Netherlands Organisation of Fish Auctions 2003-2004

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.

After several meetings the conclusion was that quality assessment should meet 2 main requirements reliability and freshness. A solution is needed to develop a method for fast performance in practice. QIM can be used in this system possibly with a reduced number of QIM attributes for daily control with the normal QIM-scheme as a backup. The staff needs training.

2.3.9. Flemish fish auctions 2003-2004

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 approached RIVO to help in the development of 10 new QIM schemes in 2003. 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.

Collaboration with DVZ Oostende continued in 2003 regarding the development of 12 QIM schemes for new species in Belgium. Within this project. RIVO assists in validation and advice.

2.3.10. 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 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 was 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.

2.3.11. 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 control 21-22 November 2002, Budapest, Hungary. The ESN seminar was attended by over 50 d from 15 different countries in addition to 20 speakers and representatives form member institute European Sensory Network.

2.3.12. QIM introduced in USA

At the first Trans Atlantic Fisheries Technology conference (TAFT) in Iceland from 10 - 14 June 2004 the QIMchain project team discussed with Professor David Green (North Carolina State University) the possibilities for further introduction of QIM in the USA. Durita Nielsen of DIFRES worked with David Green and the program staff to improve overall acceptability of hybrid striped

bass. The project objectives were to develop a Quality Index (QI) for farm-raised hybrid striped bass based on the Quality Index Method (QIM) and to introduce the QIM concept for assessing fish quality to the North Carolina fish and aquaculture industries.

2.3.13. 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.

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 held in Hamburg, Germany. A presentation was given by Joop Luten at RIVO.

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

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.

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

2.3.14. Other activities:

Partner no. 1, IFL

IFL is using the QIM method in fish freshness evaluation in teaching and training in the Fisheries Training Programme of the United Nations University 2003 and 2004.

An introduction was given on the status of the QIM-method in Europe for the staff at the Directorate of Fisheries which is an Icelandic Government institution under the ultimate responsibility of the Minister of Fisheries. The Directorate is responsible for implementing government policy on fisheries management and handling of seafood products. Furthermore, the Directorate is the competent authority responsible for enforcing laws and regulations regarding the handling, processing and distribution of marine products. It is also responsible for the operation of border inspection posts, controlling imports of fishery products into the European Economic Area.

A meeting was held for an Icelandic Fish Processing company and exporter of fresh fish to the Netherlands and Belgium with the retailers from the Netherlands and a presentation was given on the use of QIM-method in the chain from landing the fish to the buyers. The fish processor and the retailers showed great interest in the methods and expressed the opinion of using such a method would facilitate the selling and buying of fish between countries.

A presentation was given at the workshop Nordic Workshop in Sensory Science-Advanced Sensory Tools for Improved Products, QIM-Method in assessing the quality of fish 6-8 May 2004, Turku, Finland

Partner no. 2 RIVO has in 2003 made a proposal to harmonise the training for new QIM-inspectors. This harmonisation is based on a 6- days programme 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.

The handheld device for demonstrating the QIM software has been used several times during exhibitions and presentations.

Collaboration with Youngs Bluecrest UK Close contacts have been made with Youngs Bluecrest UK for the development of a QIM scheme for Norway Lobster Tails.

Participant no. 3, During the second project year several activities have taken place.

- Collecting addresses for the QIMCHAIN news.
- DIFRES personnel has given courses in using QIM for evaluating salmon in a national project together with the smokehouses.
- DIFRES, in connection to a national project, has visited fishmongers all over Denmark to give them information on how they could use QIM.
- DIFRES personnel has presented and demonstrated QIM at a workshop for Royal Greenland.
- DIFRES personnel has been contacted of several people for information about QIM. These include people from the industry, fishmongers, supermarkets etc.

Other DIFRES activities:

- A C-QIM workshop 3 March 2003 in Roskilde, Denmark for technical staff from the Food Industry.
- In a national project; "Less known fish species" DIFRES has developed QIM scheme for dab and flounder and C-QIM scheme for round fish species and flat fish species.
- DIFRES are using QIM for salmon in a national project about cold smoked salmon.

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

Application of the Quality Index Method in research projects run at Fiskeriforskning

2000 – 2002. MUSTEC - Development of Multi-Sensor Techniques for Monitoring the Quality of Fish, FAIR CT98-4076. In this project QIM was used to determine freshness as a reference for a number of different measurement methods.

2001 – 2003. SPECTEC – Development of Spectroscopic Techniques for rapid quality assessment of fresh fish. In this project QIM was the method of reference for spectroscopic determination of freshness. The project was financed by the Norwegian Research Council.

2001 – 2003. Quality of salmon and halibut. In this project QIM is used to assess the freshness state of halibut. This is in co-operation with the Norwegian Institute of Marine Research and was financed by the Norwegian Research Council.

2002 – 2003. Quality perception and product image of farmed and fed cod in the Norwegian and English restaurant segment. In this project QIM was used to describe the quality of the fish prior to presentation in the restaurant. The project is in co-operation with the Norwegian Seafood Export Council.

Participant no. 6, IPIMAR, has disseminated the QIM methodology, both in scientific papers and in theses written by students for a high school graduation or Master of Science Courses. IPIMAR has 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.

Partner no 7: AZTI

AZTI activities have been on the introduction of the QIM for two main actors of the fishing sector in the north of Spain: Fundación Kalitatea and Bermeo fishing port. Fundación Kalitatea is a Foundation that is in charge of defining and promoting food products with some quality features that make them singular through their Quality Label “K”. In the fish sector, they have applied their quality label to some of the most important fish species in Spain: *Thunnus alalunga*, and *Thunnus thynnus*. Bermeo fishing port is one of the few ports provided with an electronic auction in the Cantabric Coast.

A 5 hours seminar on Fish Sensory Analysis and QIM for fresh and frozen fish products was lectured on 12th and 13th March inside the 2004 edition of the III Magister “Ciencia y tecnología de conservación de productos de la pesca” (Science and preservation technology of fish products) that takes place every two years and is organised by the Spanish association of Fish Canneries, ANFACO-CECOPECA, and the University of Vigo.

Projects in which QIM has been used the last 2 years:

In 2002: -

Análisis de la cadena de valor del pescado fresco capturado por la flota vasca.

Funding: Agriculture and Fisheries Dtm. of the Basque Government.

Programa para facilitar la clasificación del pescado en función de su frescura.

Funding: Agriculture and Fisheries Dtm. of the Basque Government.

Labelización de túnidos.

Funding: Fundación Kalitatea.

In 2003:

Desarrollo de la hibernación como sistema de conservación del pescado fresco.

Funding: Agriculture and Fisheries Dtm. of the Basque Government.

Estándares de calidad para el mercado electrónico de los productos pesqueros.

Funding: Agriculture and Fisheries Dtm. of the Basque Government.

Estudio para la implantación de la trazabilidad y normalización del pescado fresco en la futura lonja virtual del aeropuerto de Vitoria-Gasteiz.

Funding: Agromare-VIA.

2.4. Future actions

More newsletters will be published by QIM-EUROFISH. All network participants will be sent the newsletter and contacted when news appear on the homepage.

3. PROGRESS REPORT OF WORKPACKAGE 2 – QIM WORKSHOPS**3.1. Objectives**

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

3.2. Description of work

The work in this work package was to organise and hold two workshops. Based upon consultation among all partners in the project and other relevant end-users, the dates, location and contents of two workshops on QIM were decided. Between 40 - 50 quality managers from fish auctions and fish processors with no experience of using QIM participated in these workshops.

At the workshops, lectures were given and practical sessions held, where the QIM method used to evaluate the freshness of fish. During the practical demonstration the emphasis was put on how the QIM can be used and implemented in quality management and trade. Industrial key end-users of QIM were contacted and invited to the workshops. The participants were expected to be able to incorporate QIM into their part of the chain on a demonstration scale.

3.3. Results and deliverables

Several introductions to QIM, which can be regarded as ‘mini-workshops’ have been given: in the UK and Ireland, Belgium and Iceland. During these ‘mini’ workshops a theoretical introduction has always been given as well as a practical demonstration of using QIM to evaluate fish. In Iceland four one-day courses in sensory evaluation on whole fish were organised jointly 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 in the use of QIM to evaluate whole fish (cod, haddock, red fish and plaice) in a rapid and a 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 quickly became 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.

The QIM for farmed salmon has been introduced to three smoke houses in Denmark and has been used in one of the smoke houses for a period of four weeks.

A one day workshop on C-QIM, for technical staff from the food industry was given by DIFRES.

A 5 hours seminar on Fish Sensory Analysis and QIM for fresh and frozen fish products was held on 12th and 13th March inside the 2004 edition of the III Magister “Ciencia y tecnología de conservación de productos de la pesca” (Science and preservation technology of fish products) that takes place every second year and is organised by the Spanish association of Fish Canneries, ANFACO-CECOPESCA, and the University of Vigo.

It was decided to wait until after the Seafood Exhibition in Vigo, Spain in September 2003 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 and producers. It has been found necessary to introduce QIM via tour to the industry before a real workshop could be held. The date, location and contents of two workshops on QIM were decided at the project management

All of the participants all of them have made contact with the key-actors in their respective countries.

Report from workshop in Vigo. The workshop in Vigo, Spain was held on January 27th 2004. The organizing committee was Rosa Fernández (Centro Tecnológico del Mar – fundación CETMAR), Grethe Hyldig (Danish Institute for Fisheries Research, DIFRES), Mercedes Careche and Ana Herrero (CSIC Instituto del Frio).

The interest for the workshop was enormous, 24 participated and 32 wanted to be included on a waiting list in the case that the workshop would be repeated. Because of the interest from the media a press conference was held during the morning. Reporters from two TV stations and from eight newspapers showed up. And they wanted to learn what QIM is all about.

The workshop took place at CETMAR and the practical QIM session at CSIC Instituto del Investigaciones Marinas. Rosa Fernández took care of all the practical things during the workshop. Grethe Hyldig gave all the presentations and Mercedes Careche translated it to Spanish. To help with the seminar there was Ana Herrero and Ditte Green-Petersen. The species in the QIM seminar was Giltheaded Seabream and frozen Hake, there were samples of three different storages time for both fish species. The participant followed the instructions and tried out the QIM evaluation in groups of two or three persons.

After the results from the seminar had been discussed the first examples of the QIM manual in Spanish were presented.

A press conference was held in the morning. Reporters from two local TV stations and from eight newspapers attended. After the QIM workshop, Mercedes Careche was interviewed in a radio program dealing with agro-fish-economy. Mercedes Careche also presented the outcome of the QIM workshop during a meeting at the Spanish Ministry of Agriculture, Fisheries and Food last Friday. Representatives from the Department dealing with Promotion of fishery products and the General Secretariat of Marine fisheries expressed their interest in QIM and they were impressed with the Spanish QIM manual. It is the aim to see if a further collaboration between QIM Eurofish and the Spanish partners involved in the workshop for future QIM activities in Spain can be established.

Report from workshop at Billingsgate Fish Market

The Second workshop was organized and held by the management partners RIVO, IFL and DIFRES. This workshop of QIMCHAIN-project was held in collaboration with Adrian Barratt from Seafish Industry Authority at Billingsgate Seafood Training School at Billingsgate market in London on 22nd of June 2004. The Billingsgate Market is the most important inland market in the UK. Daily arrivals from the coast and overseas ensure a continuity of fresh supplies with some 54 merchants trading in the Market Hall. The main aims of the Billingsgate Seafood Training School is to train young people who wish to undertake a career within the fish industry by re-introducing school programs and benchmark industry-wide training.

About 20 participants were at the workshops from inspection bodies, research associations, fishmongers and retailers.

The workshop started early as the participants were given a guided tour to see the Billingsgate fish market. The variety of fish species transported from all parts of the world was amazing.

Emilía Martinsdóttir, Grethe Hyldig and Rian Schelvis-Smit from QIM-Eurofish gave presentation on different topics. At the practical demonstration the participants showed a lot of interest in trying by themselves to evaluate the freshness of different coded fish samples and compare them to the results of the teachers.

In all, 44 key-users have participated in the two workshops. They now have knowledge and experience in using QIM.

Report based on information from key-actors

Following is a short overview of the status of QIM in the partners' countries based on information from the key-actors.

Norway Training in Norway is not done regularly but there is a need for training. Discussion should be started with the European Commission to recommend the QIM, as it is difficult to have the industry to use the method if it is not in regulations. Tracability is a strong point for the advantages of the QIM method compared to the existing EU scheme. In Norway there is an interest in assessing quality and a need with regard to costumers. The freshness is not a problem and the bigger companies are doing their own evaluation for use in claims. The focus in Norway is now on fresh fish and there is an increasing interest in QIM.

Portugal pointed out that differences between countries have to be taken into consideration.. Auctions are interested in QIM, but their opinion is that it is not fast enough to have it on a national level.

Spain: The interest comes from fish factories but it is difficult to have the auctions to do something. However, the interest is increasing. The aim is to hold more workshops. Auctions are not evaluating the freshness and not even using the EU-scheme. Quality labels of fish are used by some, therefore there is a great need for QIM, e.g.regarding tuna.

Germany: The focus is on frozen fish but wholesalers are interested in QIM, veterinerian inspection as well. A great deal of frozen fish and fillets is imported and the industry would like to use QIM on fillets. Fresh fish is also imported but QIM schemes are not available for the species involved. Interesting collaboration project exist between countries. One is with Greece, and the possibilities are to distribute QIM around the world. In the fish auctions there is nearly no checking of quality, not even EU scheme and there is also obligation of using EU besides QIM.

Denmark: Because of research projects, smokehouses have discovered the importance, they are concerned about how fast the method may be used. The only official requirement for fishmongers are knowledge about hygiene, but it was very useful to introduce QIM. Big supermarkets are interested as well.

Iceland During courses for fishmarkets, participants were satisfied with the method and found it easy to use. Why do they not use it everyda, then? They are not obliged to use it. They are starting to sell fish through the internet to France, a quality score should be needed for that – but the problem is that they are afraid if the score is not indicating high quality. The interest has increased in the past two years. Fish processors are now interested to show their retailers of fresh fish that they are using a freshness evaluation. Maritec has still interest in the software and the method and is interested in continuation

Netherlands: The interest comes from Pefa and they want the QIM in their clock and to have trained people. There is a lack of money so that is where they cut down. All auctions are interested, but do not know how to implement it, and are, therefore, dragging their feet. A Belgium auction is assessing most of the fish by QIM, and have it on the clock, it used to be also the EU gradeing, but are now only using QIM. They are carrying out a project to develop 13 more QIM schemes. Interest is in UK but people there who were used to using Torry are beginning to realise the advantages of using QIM instead. Auctions in the UK will be trained by Seafish.

The view that auctions should be carefully chosen as well as interested processors has been expressed, i.e. that it is essential to reach the right parties in the processing chain. If the EU commission contributes to the training, it would definitely speed up the implementation. An implementation plan is needed to have the people to use the method.

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. For a successful application of QIM in the fish sector and to facilitate implementation of the QIM method and stimulate general acceptance of the method, the guidelines and reference manuals must be in all languages of the partner's countries.

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 was also translated into Icelandic, Dutch and Danish. Practical reference manuals and guidelines, which will make the method easily workable and rapid for assessment of fish samples in the fish sector, based on existing information, were translated and printed in 10 languages. The guidelines and the manuals contain information on subjects such as: panel selection, panel training, sampling plan, assessments, facilities and examples of QIM-schemes and pictures.

The text and tables were delivered to all of the participants and the subcontractors for translation in word- and excel-formats. All of them delivered the translated text and tables back to Partner No 1 (coordinator). The software QUARK was used for design and printing of the manuals.

The Spanish manual was ready before the workshop in Spain in January 2004.

The manuals have been delivered to the representative of DG-12 Isabelle de Froidmont-Görtz.

4.2. Results and deliverables

Printed manuals in all 10 languages. The schemes in 10 languages have been delivered to Maritech partner no. 8 for update of the existing software. The manuals in all languages will be available via the QIM-Eurofish web-site in the future. Already over 70 copies have been sold in English to people from all over the world and now orders for manuals in other languages are sent in.

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 fairs were 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. At the exhibitions practical demonstrations on how to use QIM must be given.

Dissemination materials to be used was selected: poster, handout, QIM-Eurofish brochure “QIM-your ideal tool for quality determination of fish freshness” and a software demo. A new poster about QIM was made, more suitable for exhibitions. RIVO has bought a handheld terminal and laptop with an antenna system with the Wisefresh software (QIM software tool). This has been used for demonstration activities.

The following fish exhibitions were used for dissemination

The following fish exhibitions were 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.

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

Polish – Gdansk (Poland) , International Fair of Fish Processing and Products in May 2003. QIM was presented with a poster and leaflets.

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

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

BIM-Irish seafood expo (10/11-9-2003): 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): Posters, presentation of QIM-Eurofish brochure and demonstration of software.

European Seafood Exhibition Brussels 4-6 May 2004. Presentation of QIM manual in 11 European languages. Demonstration of QIM-software and handheld device. Several posters with information on QIM.

5.3. Results and deliverables

The aforementioned demonstration of QIM at the various fish exhibitions has undoubtedly increased awareness of QIM within the fish sector. The selected exhibitions represent the whole fisheries chain for fishermen and auctions, processing and products. This increased awareness has resulted in invitations for presentations about QIM at auctions, information material, that has been used at the exhibitions include posters, the QIM-Eurofish brochure “QIM-your ideal tool for quality determination of fish freshness” and a demo version of the QIM software.

5.4. Dissemination of research results

At the QIM-Eurofish website the exhibitions are listed.

6. PROGRESS REPORT OF WORKPACKAGE 5 –QIM ARTICLES

6.1. Objectives

The aim is to introduce the Quality Index Method (QIM) and to 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 also 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 widely disseminate 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.

6.2. Description of work

The participants have written articles about QIM and the development of QIM. These articles were published in international industry oriented and popular journals. Articles were published in national fish trade journals.

6.3. Results and deliverables

International magazine:

Name of article: QIM for evaluating fish freshness. *Name of author:* Emilía Martinsdóttir *Name of paper:* INFOFISH International March/April N0. 2/2004

Scientific articles:

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. Oehlenschläger, G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

Schelvis-Smit, A.A.M and J.B. Luten,. 2003. Catch Index: Development 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. Oehlenschläger, G. Ólafsdóttir. Wageningen Academic Publishers, the Netherlands

Name of article: QIM - a tool for determination of fish freshness. *Name of author:* Hyldig, G. & Nielsen, J. *Name of scientific paper:* F. Shahidi & B. K. Simpson, eds., ScienceTech Publishing Company, St John's, NL, pp. 81-89, 2004

Name of article: Quality Index Method – An Objective Tool for Determination of Sensory Quality. *Name of author:* Grethe Hyldig and Ditte Green-Petersen: “Quality Index Method – An Objective Tool for Determination of Sensory Quality.” *Name of scientific paper:* Journal of Aquatic Food Product Technology, accepted 2004

Name of article: Influence of handling procedures and biological factors on the QIM evaluation of whole herring (*Clupea harengus* L.). *Name of author:* Nielsen D and Hyldig G. *Name of scientific paper:* Food Research International. *In press.*, 2004

In Danish:

Name of article: Udvikling og demonstration af kvalitetsindeksmetoden (QIM) til kvalitetsstyring i den Europæiske fiskesektor. *Name of author:* Grethe Hyldig. *Quality.* *Name of paper:* Under Overfladen 2004, 39:13-15

Name of article: Anvend kvalitetsindeksmetoden og få et mål for hvor frisk fisken er *Name of author:* Grethe Hyldig. *Quality.* *Name of paper:* Fisk og Hav Oktober 2004.

In Dutch:

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

Name of article: . KIM geeft info over kwaliteit in hele visketen. *Name of author:*

Rian Schelvis-Smit. *Name of paper:* Visserij nieuws, 7 mei 2004. p 10.

In Icelandic:

Name of article: Evaluation of fish quality at fish auctions in Iceland *Name of author:* Emília Martinsdóttir and Bjarni Askelsson (Federation of fish auctions) *Name of paper:* Aegir 96, 4 2003 30 - 33

Name of article: Þarf að meta ferskleika fisks *Name of author:* Emília Martinsdóttir *Name of paper:* Aegir, 2004, 7, p. 14 to 17.

In German.

Name of article: Qim, Eine Methode zur Bestimmung der sensorischen Qualität von Fisch *Name of author:* Emília Martinsdóttir *Name of paper:* Food Ingredients Sensorik, Newsletter, Behr's Verlag Hamburg, Germany, October 2002.

Name of article: Die Qualitäts-Index-Methode (QIM), ein verlässliches Instrument zur sensorischen Bewertung der Frische von Fisch *Name of author:* Jörg Oehlenschläger *Name of paper:* Informationen für die Fischwirtschaft aus der Fischereiforschung, in press 2004

In Norwegian

Name of article: QIM-Dokumenterer produktets ferskhet *Name of author:* Nils Kristian Sørensen, Heidi Nilsen and Leif Akse *Name of paper:* Fish - industry & market" July 2004

In Portuguese

Name of article: Aplicação do índice de qualidade (QIM) na avaliação da frescura do oesca do ferskhet *Name of author:* Maria Leonor Nunes e Irineu Batista *Name of paper:* IPIP MAR "Dívilgção market" No 29. March 2004.

In Spanish:

Partner no. 7 AZTI has produced a publication on Sensory evaluation of fish freshness in Spanish and distributed to the following media:

- Electronic news release: *Basque Research*
- Agrofishing divulgative journal: *Sustrai*
- Spanish fish trade journals: *Europa Azul* and *Rutas Pesqueras*.

Pérez-Villarreal, B.. Sensory evaluation of fish freshness, Journal Productos del Mar, Sept/Oct 2004

Through the QIM-Eurofish website a contact in Argentina requested information about QIM. This is used for an article in a Argentinean fish trade journal: Cuán fresco está el fresco? Revista Redes, de la industria pesquera Argentina. N° 135 mar/abr 2004. p80-84.

Copies of the publications are in Appendix 7

Partners 1, 2 and 3 have written a chapter in a book scheduled for publication in 2004.

G. Hyldig, A. Bremner, E. Martinsdóttir and Rian Schelvis-Smit, 2004. Quality Index Methods in "Sensory Evaluation of Muscle Food", eds. Y. H. Hui, A. Carbonelle, P. Coggins, G. Hyldig, L. McKee, O. Sanders, , DEStech Publications, Inc., Lancaster, Pennsylvania

Furthermore, QIM is mentioned in several scientific articles when used as the reference method to assess fish freshness or a part of the referenced methodology.

Publications where QIM is part of the reported methodology :

Development of a Quality Index Method (QIM) for maatjes herring stored in air and under modified atmosphere. Authors . Ulrike Lyhs and Rian Schelvis-Smit. Submitted for publication .

Esaiassen M, Nilsen H, Joensen S, Skjerdal T, Carlehög M, Eilertsen G, Gundersen B and Elvevoll E (2004) Effects of Catching Method on Quality Changes during Storage of Cod (*Gadhus Morhua*). Accepted for publication in Lebensmittel-Wissenschaft und- Technologie.

Heia K, Esaiassen M, Nilsen H and Sigernes F. (2003) Visible spectroscopy – Evaluation of storage time of ice stored cod and frozen stored hake. In Quality of Fish from Catch to Consumer. Labelling, Monitoring and Traceability. Eds.: JB Luten, J Oehlenschläger and G Ólafsdóttir, Wageningen Academic Publishers, p 201-209, ISBN 9076998140.

Heide M, Johnsen O, Tobiassen T, Østli J and Hamnvik S (2003) Experienced quality and image of farmed and fed cod in the Norwegian and English restaurant segment. Report 8/2003 from Fiskeriforskning (in Norwegian).

Nilsen H, Esaiassen M, Heia K and Sigernes F. (2002) Visible / Near-Infrared spectroscopy - a new tool for the evaluation of fish freshness? Journal of Food Science, 67(5), 1821-1826.

Nilsen H and Esaiassen M (2003) How Fresh is the Fish ?- Evaluation of Freshness by Means of VIS/NIR Spectroscopy, Proceedings of the First Joint Trans-Atlantic Fisheries Technology Conference (TAFT), 33rd WEFTA Meeting And 48th Atlantic Fisheries Technology Conference, 11th-14th June 2003, Reykjavik – Iceland, p 138-140.

Nilsen H and Esaiassen M. (2004) Predicting sensory score of cod (*Gadus morhua*) from visible spectroscopy. Submitted to Lebensmittel-Wissenschaft und- Technologie.

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

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 in 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 has 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 available on the web-site.

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

A new stats system has been deployed by the hosting provider, and data from August 2003 to August 2004 is purged. From September 2003 incremental counting is available.

Unique Visitor is a unique visitor 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.

Results and deliverables

Key information on visits to the homepage:

		Unique visitors	Numbers of visits	Pages
Sept	2003	333	531	3032
Oct.	2003	466	919	3593
Nov.	2003	520	985	3761
Dec.	2003	491	928	4608
Jan.	2004	459	920	3741
Feb	2004	455	806	2899
Mar	2004	466	1200	5907
Apr	2004	415	1157	5951
May	2004	439	1122	6514
Jun	2004	378	875	6175
Jul	2004	324	801	4324
<u>Aug</u>	<u>2004</u>	<u>361</u>	<u>872</u>	<u>4241</u>
Total		5107	11116	54746
Average		426	926	4562

The visitors on the web-site are coming from all over the world. Visitors are from many of the European countries. France, Spain Germany, Iceland Norway, Denmark, UK, Italy, Greece, Estonia, Belgium but also from other parts of the world: Panama, Canada, Australia, Argentina and Brazil.

Dissemination of research results

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

7.3. Results and deliverables

Dissemination of all activities of the project on the web-site.

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

8. PROJECT MANAGEMENT

The Icelandic Fisheries Laboratories, IFL, has been 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. To ensure effective management, a management team was formed, consisting of Emília Martinsdóttir, the coordinator, Joop Luten and Rian Schelvis-Smit, RIVO and Grethe Hyldig, DIFRES. The management team has met 3 times during the second year, Oct. 23rd, 2003 in Copenhagen, Feb.. 5-6th, 2004 in Aarhus, Denmark and June 21st, 2004, in London. The daily communications between the meetings have been via e-mail networks. A collective meeting of all partners in the accompanying measure was held on May 5th 2004. The partners have kept record of individual time and expenses and provided the co-ordinator with this information.