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FINAL TECHNICAL REPORT

Capacity building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

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Final Technical Report: Capacity building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

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Front cover: Fish landings in Kingstown, St. Vincent and the Grenadines

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LIST OF ACRONYMS AND ABBREVIATIONS

AAS	Atomic Absorption Spectroscopy
ACP	African, Caribbean and Pacific states
AHFS	Agricultural Health and Food Safety
AOAC	American Association of Analytical Chemists
ASAE	Economic and Food Safety Authority of Portugal
BAM	Bacteriological Analytical Manual
CA	Competent Authority
CAHFSA	Caribbean Agricultural Health and Food Safety Agency
CARICOM	Caribbean Community
CARIFORUM	Caribbean Forum of African, Caribbean and Pacific (ACP) States
CARIRI	Caribbean Industrial Research Institute
CCFFP	Codex Committee on Fish and Fishery Products
CIF	Cost, Insurance and Freight
Codex	Codex Alimentarius Commission
CODOPESCA	Dominican Council of Fisheries and Aquaculture
CRFM	Caribbean Regional Fisheries Mechanism
DG SANTÉ	Directorate General of Health and Consumer Protection
EDF	European Development Fund
EFSA	European Food Safety Authority
ELISA	Enzyme Linked Immuno-Sorben Assay
EMP	Environmental Monitoring Plans
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FBO	Food Business Operator
FDA	Food and Drug Administration
FFOS	Fishermen and Friends of the Sea
FP	Fishery Products
FVO	Food and Veterinary Office
GC.MS	Gas Chromatography – Mass Spectrometry
GDP	Gross Domestic Product
HACCP	Hazard Analysis and Critical Control Points
HMS	Hydroxymethanesulfonate
HPC	Heterotrophic Plate Count
HPLC	High Performance Liquid Chromatography
ICP	Inductively Couples Plasma
IICA	Inter-American Institute for Cooperation on Agriculture
INFOSAN	International Food Safety Authorities Network
IPMA	Portuguese Institute of the Sea and the Atmosphere (Instituto Português do Mar e da Atmosfera)
ISO	International Standards Organisation
JANAAC	Jamaica National Agency for Accreditation
KPI	Key Performance Indicators
LC-MS	Liquid Chromatography – Mass Spectrometry
LMG	Leucomalachite green
MAP	Modified Atmosphere Packaging
MG	Malachite green
NGO	Non-Governmental Organisation
NVI	Norwegian
PAH	Polycyclic Aromatic Hydrocarbons

OCT	Overseas Countries and Territories
OIE	World Organisation for Animal Health
RASFF	Rapid Alert System for Food and Feed
RMP	Residue Monitoring Plans
RPA	Reference Point for Action
SOP	Standard Operating Procedures
SPS	Sanitary and Phytosanitary
SVG	Saint Vincent and the Grenadines
SWOT	Strengths, Weaknesses, Opportunities and Threats
ToR	Terms of Reference
TPH	Total Petroleum Hydrocarbons
TVBN	Total Volatile Basic Nitrogen
UK	United Kingdom
UNIDO	United Nations Industrial Development Organisation
UTT	University of Trinidad and Tobago
UNU-FTP	United Nations University – Fisheries Training Programme
WECAFC	Western Central Atlantic Fishery Commission
WHO	World Health Organisation

CONTENTS

1. INTRODUCTION

This Report is submitted by Megapesca Lda of Portugal, a food and fisheries consultancy firm established in 1994 and is the Final Report for the Project "Capacity building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade". The project was implemented by the Inter-American Institute for Cooperation on Agriculture (IICA) under the EU funded project "10th EDF Sanitary and Phytosanitary Measures Project". The Caribbean Regional Fisheries Mechanism (CRFM) was nominated by IICA as responsible for the coordination of the technical implementation of the project.

2. DESCRIPTION OF THE INTERVENTION

2.1 Objective

The objective of the project, according to the Terms of Reference (ToR) is:

To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

2.2 Project results

The project aims to:

- Develop at least 8 food safety operational manuals for field, laboratory, market and trade (import and export) to support the activities of designated persons and institutions responsible for the safety of fish and fish products;
- Develop training programmes for improving official control and testing laboratory skills in SPS quality management of fish and fish products, (including the supply of relevant equipment);
- Deliver the training programmes in short courses in the region;
- Design and implement Impact Assessment Tools; and
- Design relevant communication and visibility products.

The expected result is that capacities will be built at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

3. IMPLEMENTATION TEAM

The project was implemented by two key Megapesca experts:

- Team Leader / Food Safety Specialist (Key Expert 1) for a total of 54 fee days: Dr. Ian Goulding
- Specialist in Food safety testing laboratory management and ISO17025 (Key Expert 2) for a total of 44 fee days: Dr. Christine Froese

The delivery of the services was also supported by six additional technical specialists:

- Mr. Iñigo Hernadez, BIOLAN, Spain Training on rapid histamine analysis
- Dr. Ana Cristina d'Aiutolo, BIOPHARM, Argentina, Training on rapid testing kits for microbiology, veterinary medicines
- Mr. Grahame Mellanby, Frost Studio, York UK, Video and still photo production:
- Mr. Oscar do Porto (Translation – English to Spanish)
- Ms. Yolaine Beyens (Translation – English to French)
- Ms. Edith van der Raats (Translation – English to Dutch)

4. PROJECT MILESTONES

The Terms of Reference of the intervention are shown in Annex 1.

The project commenced on signature of the contract on 26 August 2016, and is expected to finish at the end of January 2017. This Report follows the submission of an Inception Report on the 08 October 2016 (Annex 2) and an Interim Progress Report on the 17 November 2016 (Annex 3), both subsequently approved by the CRFM and IICA.

5. METHODOLOGY

Since the commencement of the project the following activities have been carried out.

5.1 Preparation of training manuals

The consultants have drafted eight operations manuals, as follows:

1. Manual on Assuring Food Safety Conditions in Capture Fisheries
2. Manual for the Inspection and Official Control of Caribbean Fishery Products
3. Manual on Assuring the Food Safety of Aquaculture Products
4. Guide to Food Safety Hazards in Caribbean Fishery Products
5. Manual on Assuring Food Safety Conditions in Fish Landing and Processing
6. Manual on Traceability Systems for Fish and Fishery Products
7. Manual on Laboratory Testing of Fisheries Products
8. Manual on Laboratory Quality Assurance

The methodology for the development of the training manuals was based on a detailed literature search, drawing on the latest publications and standards expressed within:

- EU legislation
- Publications of the EU Project "Strengthening Fishery Products Health Conditions In ACP/OCT Countries"
- Codex Alimentarius Standards and Codes of Practices
- ISO Standards
- AOAC Methodologies
- US FDA Hazards and Control Guidance

A detailed list of references which underpin this work is provided within each manual, in footnotes and annexes. The drafting of the manuals also drew on the experience of the consultants in the implementation of official controls and laboratory testing procedures.

The draft manuals were circulated for comment to training course participants and CRFM Secretariat. Comments were received from eight stakeholders. Most of the comments received were valid and have resulted in amendments to the documents. A small number of the comments received were not addressed by the consultants, and where this was the case a justification was provided. Comments and the responses were circulated to those who provided them.

The manuals were revised accordingly and submitted for the final approval of the IICA / CRFM. Draft manuals were produced and supplied to participants in the training courses, which provided a further opportunity for editing. Final checking of the final materials was then undertaken at the home office.

5.2 Translation of the training manuals

The consultants identified specialists to undertake the translation of the manuals into three languages: Spanish, French and Dutch. The translators are subject specialists (with intimate knowledge of food safety of fishery products) who are native speakers in the relevant language.

Following the request of the consultants, the CRFM Secretariat agreed that it would not be necessary to translate Manuals 7 and 8 (concerning laboratory analysis and laboratory quality control) since the users of these would need English language skills in any case to be able to apply the essential reference documents (such technical methodologies, ISO standards, etc. which are only available in that language).

The CRFM Secretariat assisted the consultants in obtaining the relevant ISSN and ISBN numbers for the manuals.

The full list of manuals for print and online versions, with official citations, ISBN and ISSN codes is shown below. Online versions were transmitted to the CRFM Secretariat for uploading to the Special Publications page of the CRFM website at:
http://www.crfm.int/index.php?option=com_k2&view=itemlist&layout=category&task=category&id=40&Itemid=244

5.2.1 Print versions

English	Spanish	French	Dutch
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Goulding, I.C, 2016. Manual on Traceability Systems for Fish and Fishery Products. *CRFM Special Publication*. No.13. 15pp. **ISSN: 1995-4875** **ISBN: 978-976-8257-37-6**	Goulding, I.C, 2016, Manual de sistemas de trazabilidad del Pescado y Productos Pesqueros, *CRFM Publicación Especial* No. 13, pp.18. Traducido por Oscar do Porto, 2016. Titulo original: Manual on Traceability Systems for Fish and Fishery Products **ISSN: 2519-8726** **ISBN: 978-976-8257-55-0**	Goulding, I.C, 2016. Manuel sur les Systèmes de Traçabilité pour les Poissons et les Produits de la Pêche. *CFRM Publication Spéciale*. No. 13. 18pp. Traduit de l'Anglais par Y. Beyens, 2016. Titre original: Manual on Traceability Systems for Fish and Fishery Products. **ISSN: 2519-8718** **ISBN: 978-976-8257-56-7**	Goulding, I.C, 2016. Handleiding voor traceerbaarheidssystemen voor vis en visserijproducten. *CRFM Speciale publicatie* nr. 13, 25 blz. Vertaald uit het Engels door E.M. van der Have-Raats, 2016. Oorspronkelijke itle: Manual on Traceability Systems for Fish and Fishery Products. **ISSN: 2519-8734** **ISBN: 978-976-8257-57-4**
Froese, C, 2016. Manual on Laboratory Testing of Fishery Products. *CRFM Special Publication*. No.14. 89pp. **ISSN: 1995-4875** **ISBN: 978-976-8257-38-3**	Not translated	Not translated	Not translated
Froese, C, 2016. Manual on Laboratory Quality Assurance. *CRFM Special Publication*. No.15. 59pp. **ISSN: 1995-4875** **ISBN: 978-976-8257-39-0**	Not translated	Not translated	Not translated

5.3 Printing of the manuals

The consultants identified a suitable publisher for the manuals, and arranged for the printing, binding and delivery to the CRFM Secretariat. The following number of hard copies (as set out in the ToR) was delivered to the CRFM Secretariat on 19 January 2017. This number does not include the 15 draft copies of each which were provided to participants in the training course.

English	100
Spanish	20
French	20
Dutch	20

5.4 Organisation of training courses

5.4.1 Venue and dates

Two training courses foreseen under the project Terms of Reference were delivered by the consultants at the Beachcombers Hotel, Saint Vincent and the Grenadines on the following dates:

Course title	**Dates**
Fishery Products Laboratory Testing	Monday, 28 November to Friday, 02 December 2016
Food Safety in The Fishery Sector	Monday, 05 December to Friday, 09 December 2016

5.4.2 Participants

The CRFM communicated with Competent Authorities and parent Ministries within the CARIFORUM region with a view to identifying potential beneficiaries/participants. Invitations were sent to Competent Authorities responsible for official controls in the fishery sector and laboratories responsible for testing of food safety parameters of fishery products. With assistance from the consultants, 15 suitably qualified and experienced individuals were selected to participate in each training course.

Formal offers were made and authorization was obtained from employing organisations. Information on passport details, date of birth, address, nearest international airport etc was obtained from participants. The consultants made arrangements for travel. The CRFM Secretariat supported with obtaining a visa waiver for a participant from the Dominican Republic. All 30 participants successfully attended the course, and returned to their home bases without any major difficulties.

5.4.3 Course logistical arrangements

Detailed arrangements for the travel and subsistence, accommodation, catering, transfers, per diems for the training workshop were made, in line with the specifications set out in the inception report.

Training equipment required for the course was also procured (see section 5.5).

5.4.4 Video recording and photography

Video cameras and audio recording system were purchased in the EU under the training equipment budget, and consigned to the CRFM Secretariat. The consultants arranged for the professional video recording of the course lectures, case studies and practical demonstrations using this equipment, along with stills photography for press releases, websites etc. The output was edited to produce high-quality edited set of video files (c.30.5 hours of output in 32 video files) for future use by the CRFM, Member States and regional organisations.

A list of the videos produced is shown in Annex 4.

5.4.5 Technical content of the course

The consultants prepared curricula for the training course, reflecting the structure and content of the eight manuals prepared. The curricula set out the activities and titles and content for each training session. The course materials were prepared for each session using MS Power point. Note that the courses included case studies and practical demonstrations and exercises using the equipment supplied (see section 5.5.).

All technical content, curricula, materials, case studies and videos are available at: https://1drv.ms/f/s!AoS3PEEHz3swyF83zyfAGaELqQhS.

5.4.6 Course evaluations

A detailed report on the training courses, including the course curricula, technical content and result of course evaluations is shown in Annex 5.

The evaluation method used for the training course and reported in this Annex comprises the first assessment tool to be developed under the project.

The evaluation results indicate that the training was generally highly regarded by the participants, although there could have been a greater emphasis on practical training and a greater variety of resource persons.

5.5 Procurement of equipment for the training course

Equipment required to support the training course activities was specified, suppliers were identified and the following equipment was procured and shipped to St. Vincent and the Grenadines.

	Equipment	**Suppliers**
1	15 x Lovibond comparators (potable water testing)	OilWater Industrial – Serviços e Representações Rua dos Remolares 14, 3º - 1200-371 Lisboa Tel: +351 219 537 915 Fax:+351 213 469 078 www.oilwater.pt
2	1 x Histamine analysis (Rapid methods)	BIOLAN Laida Bidea Edificio 409 · Parque Tecnológico de Bizkaia 48170 Zamudio, Bizkaia, SPAIN www.biolanmb.com
3	15 x Thermometers	AMBIFOOD Edifício Porto Magnum Rua Dominguez Alvarez, nº 44, 4.16 4150-801 PORTO www.ambifood.com
4	1 x Video and audio recording equipment	Proactive (UK) Ltd. Unit 1 Eastman Way Hemel Hempstead Hertfordshire HP2 7DU UK Web: www.proav.co.uk

All items were cleared from Customs in good time for the course, with support from the CRFM Secretariat and the St. Vincent and the Grenadines Fisheries Division.

The Consultants also supplied a projector for the presentations, carried in personal luggage. Supplies of reagents and test kits containing temperature sensitive materials were also carried personally by the trainers from BIOLAN (supplier of rapid histamine test methods) and BIOPHARM (supplier of rapid microbiological test kits) to ensure that they retained their activity and avoided the need for chilled storage on arrival. A description of the procurement arrangements and a full list of all of the equipment delivered under the project are shown in the report on training and equipment supplied in Annex 5.

All of the items supplied were used by the Consultants during the training course, and returned to the CRFM on its conclusion. CRFM subsequently donated some of the items to the Fisheries Division of St. Vincent and the Grenadines. Water quality test kits and thermometers were also donated, being received on behalf of their employing authorities, by the 15 course participants undertaking the course "Food Safety in The Fishery Sector".

5.6 Development of impact assessment tools

As required by the Terms of Reference, the consultants undertook an impact assessment exercise, which comprised three main activities:

(a) Training evaluation tool;
(b) Identification of key performance indicators based on official data sources; and
(c) Self-assessment survey of competent authority functions, and knowledge, attitude and practices.

Results from (a) indicate the immediate impacts of the course and are reported in Annex 5 (on the training course outcomes).

The Results from (b) and (c) were assessed separately in a series of exercises assessing the status of sanitary control and laboratory testing capacities in the fishery sector. The data was collated and analysed and a report on the findings is presented in Annex 6.

This report sets out the rationale for the design of the impact assessment study, describes the indicators selected and the sources of data. The consultants identified a set of published data that can be used to generate key performance indicators and implemented an email questionnaire survey with the course participants. The content of the questionnaires (which was set out for approval in the inception report) established information regarding key operational features of the official control systems and testing laboratories. This was supplemented by an additional attitudinal scaling exercise conducted during the training course; therefore providing baseline indicators for future assessment of status and progress in the strengthening of sanitary controls in the fishery sector of CARIFORUM countries.

5.7 Development of information / knowledge products

The consultants were also required to prepare a range of knowledge products for use in CRFM communications. The specific products are set out in this section.

5.7.1 Development of regional quarterly newsletter on fish sanitary controls

Two editions of a direct email newsletter were prepared and submitted to CRFM Secretariat for distribution. In total 12 articles of relevance to the Caribbean fishery sector were identified and drafted, as follows:

- World Seafood Congress to be held in Iceland, September 2017
- Last meeting of the Codex Committee on Fish and Fishery Products
- "Significant risks" claim for consumption of Trinidadian fish and shrimp from Gulf of Paria

- EU project identifies emerging hazards in seafood
- SPS Professionals from CARIFORUM receive food safety management training in Iceland
- Grant funding for attendance of young fish technologists at the 2017 World Seafood Congress
- University of Hawaii designs new app to assess benefits and risks of fish consumption
- European Food Safety Authority launches project to fight the emerging risk of ciguatoxin food poisoning in the EU
- Two CARICOM Countries report food safety concerns to Codex Committee
- European Food Safety Authority Reports on use of Malachite green in aquaculture
- Risk of contaminated aquaculture products from India entering CARICOM market
- New evidence that fraud in fishery products is a global problem

A copy of the newsletters submitted is shown in Annex 7.

5.7.2 Preparation of press releases

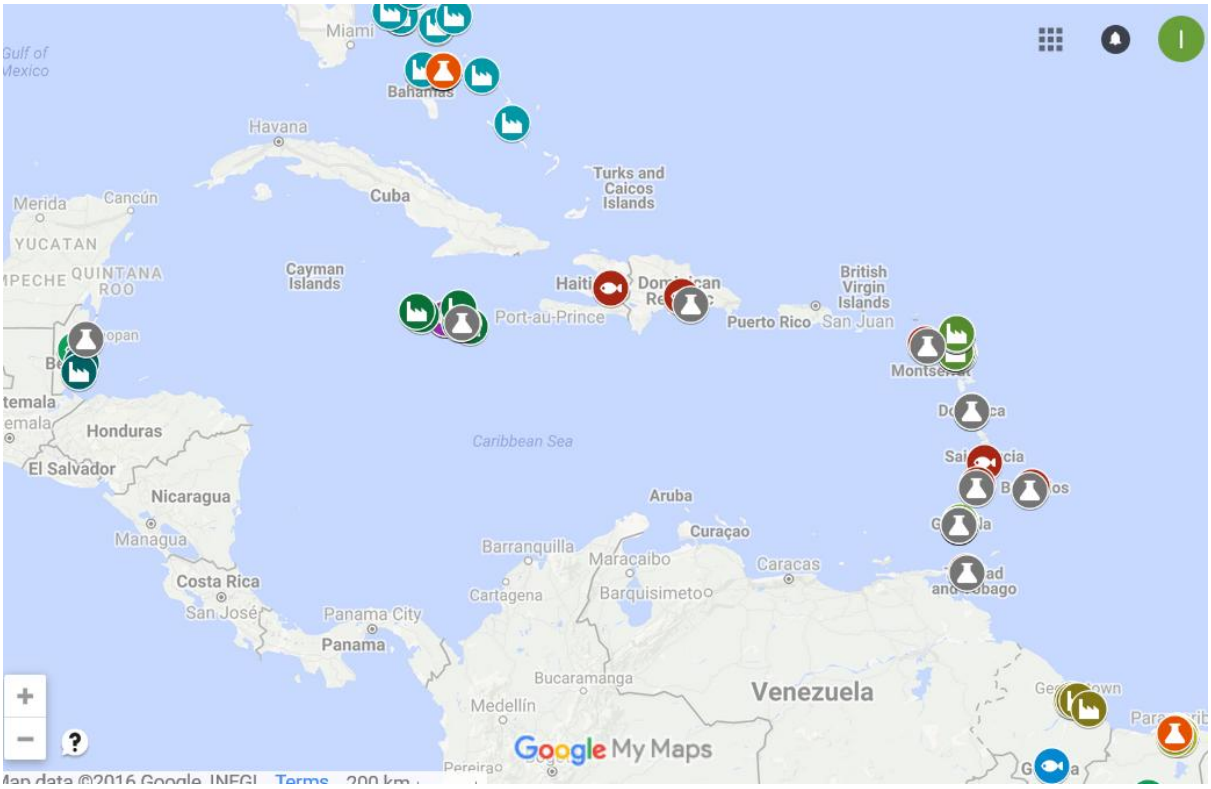
The consultants prepared three press releases presenting information regarding the consultancy and its activities, emphasising the importance of SPS measures in ensuring an economically sustainable fishery sector in the Caribbean region, and the contribution of the 10th EDF Sanitary and Phytosanitary Measures (SPS) Project.

The first addressed the launch of the project and the future training actions and the manuals.
The second reported on the training course and included photographs taken during the event.
The third reported on the outputs delivered by the whole project.

A copy of the press releases is shown in Annex 7.

5.7.3 Preparation of an infographic

The consultants prepared a map-based interactive infographic setting out relevant information and data regarding SPS issues addressing the fishery sector in the Caribbean region, as well as information regarding sanitary controls for fishery products and the laboratory testing of fishery products.



The infographic is in the form of an interactive Google map showing relevant SPS data for the Caribbean fishery sector, and is targeted at a level suitable for the public. The map is available at:

https://www.google.com/maps/d/viewer?mid=1CNNi7EAzDWCT3X71FKfoE-6PjEg&ll=15.374160806978065%2C-77.80062684433602&z=4

The map may be embedded into the CRFM website by inserting the following html code into the CRFM webpage.

```
<iframe src="https://www.google.com/maps/d/embed?mid=1CNNi7EAzDWCT3X71FKfoE-6PjEg" width="640" height="480"></iframe>
```

The online database and map was made available to the CRFM Secretariat to enable future editing.

6. SUMMARY OF OUTPUTS DELIVERED

The following table sets out the required project deliverables as per the Terms of Reference, and the outputs delivered by the consultants.

Deliverable as per ToR	Project output
Briefing Report and a work plan which identifies the project milestones, time schedule and production of deliverables for the duration of the assignment.	Project briefing (inception) report approved by CRFM on 19 October 2016
Eight (8) Manuals on food safety (6) and Laboratory (2) operations for public and private sector (hard copies and equivalent electronic versions — English -100 copies, Spanish, French and Dutch — 20 copies each).	The Following manuals were produced (English) 1. Manual on Assuring Food Safety Conditions in Capture Fisheries, 2. Manual for the Inspection and Official Control of Caribbean Fishery Products 3. Manual on Assuring the Food Safety of Aquaculture Products 4. Guide to Food Safety Hazards in Caribbean Fishery Products 5. Manual on Assuring Food Safety Conditions in Fish Landing and Processing 6. Manual on Traceability Systems for Fish and Fishery Products 7. Manual on Laboratory Testing of Fisheries Products 8. Manual on Laboratory Quality Assurance Manuals 1 to 6 translated to Spanish, French and Dutch. All manuals were submitted electronically to CRFM 30 December 2016. See Annexes 2 to 9. Manuals were printed (100 English, 20 each other languages) and consigned to CRFM 12 January 2017
SPS food safety and laboratory training curricula (one curriculum for fishery sector operations and one curriculum for fishery products laboratory testing)	Approved by CRFM on 17 November 2016. See annex 11
Delivery of two (2) training workshops.	Delivered 2 x 5 day courses in St. Vincent and the Grenadines: 9. Fisher y Products Laboratory Testing Monday, 28 November to Friday, 2 December 2016 (15 participants) 2. Food Safety In The Fishery Sector Monday, 5 December 2016 to Friday, 9 December 2016 (15 participants)
Training equipment (to be agreed): Laboratory Equipment (to be agreed): 15 sets Inspection equipment (thermometers / chlorine test kits) 1 demonstration unit histamine analysis 1 demonstration unit rapid microbial tests	Training equipment and materials was agreed and delivered as follows: 15 x Lovibond water test kits (Cl/pH) 15 x digital thermometers 1 BIOFISH Histamine testing system

1 demonstration unit ELISA test for veterinary medicine residue screening (or similar, to be agreed)	BIOPHARM Test Kits: Total count Salmonella Kit Histamin (enzymatic) Veterinary drug residue kits 1 set video recording equipment 1 overhead projector The items were officially received by the CRFM on 12 December 2016.
Interim mid-term report of progress of the action including execution of the Training Workshop (inclusive of the equipment supplied)	Interim Report submitted by consultants and approved by CRFM on 18 November 2016.
Reports (x2) on training events, including evaluation of impact of training sessions, and an account of the training equipment provided.	Training and Equipment Report (Annex 11) submitted to CRFM on 22 December 2016. Course materials available at https://1drv.ms/f/s!AoS3PEEHz3swx1MtZ5dVzhjA2riO
Videos (MP4) of training courses (edited with PowerPoint and practical demonstrations)	Training sessions were video recorded, edited into 32 training videos (to include MS Powerpoint slides), and transmitted electronically to CRFM on 02 January 2017.
Two (2) impact assessment tools, including monitoring indicators in respect of competent authority and laboratory performance	Impact assessment tools were developed and submitted for approval: (a) course evaluation questionnaire was approved in the interim report; reported in the Training and Equipment Report. (b) questionnaire surveys of Competent Authorities and testing laboratories were designed and implemented Report on Assessment Of Impacts Of Measures To Strengthen SPS Conditions In The Caribbean Fishery Sector (Annex 11). Submitted to CRFM on 28 December 2016.
Knowledge Products including: Two regional newsletters, Three press releases, One Information Poster	Following information products developed and submitted: Two regional newsletters Three press releases One Map-based infographic See Annex 12. Final items submitted to CRFM on 29 December 2016
Final Technical Report, documenting aims, methods, findings and recommendations, and including all final outputs.	Current report
Final Financial Report	This was submitted separately on 04 January 2017.

7. LESSONS LEARNT

A number of important lessons were learnt during the implementation of this project.

The project was implemented to a very tight time scale due to the impending closure of the 10th EDF SPS Project in early 2017. The technical editing of the manuals was undertaken with a demanding time schedule. Ideally, more time would have allowed a greater level of peer review by professional stakeholders of the draft manuals, thus improving relevance of the content.

The consultants found that the selection process for candidates for training (relying on the Competent Authorities to propose candidates) resulted in a wide variety of professional skills in the same group. Particularly in the course "Fishery Products Laboratory Testing" the consultants found that some of the participants were not sufficiently knowledgeable in basic microbiology and chemistry to gain the optimal benefits from the course. In future, a more rigorous selection process could ensure a more focused training.

In addition, there are several laboratories within the region which are external to the Competent Authorities and which undertake important testing for fishery products, but which were not invited to the training (e.g. CARIRI). A more structured approach to selection may have resulted in better and more consistently qualified participants.

It is also considered that a greater coordination with CAHFSA would have been beneficial to better reflect the future divisions of responsibilities between CAHFSA and CRFM. This would also help ensure that training reflects future CAHFSA plans and priorities, as the overall guardian of food safety matters within the CARICOM region.

8. CONCLUSIONS AND RECOMMENDATIONS

The project has provided the CRFM and the Competent Authorities and testing laboratories of CARIFORUM Governments with a substantive and lasting technical resource for strengthening the capacity of the sanitary control systems for fishery products. This includes up to date training manuals, training curricula, MS PowerPoint slides, and videos of lectures, case studies and practical sessions. These resources are up to date, and regionally focused (specifically with an emphasis on important regional food safety hazards such as histamine and ciguatoxin). They will remain valid for some years to come, and the outputs may therefore be regarded as sustainable for the medium term.

However, to obtain the maximum value from the capacity building investments made in this intervention, there is a need to ensure that Member States Competent Authorities, as well as training institutions in the region are made aware of the resources developed and employ them in their training and educational activities. **This will require an ongoing and sustained effort by CRFM and IICA, who are therefore recommended to ensure that the outputs are strongly promoted, at a senior level and on a repeated basis in the future.**

Where fisheries departments in the region perform the functions of a sanitary Competent Authority with risk management responsibilities they can suffer from conflicts of interest between their sectoral support and regulatory functions. For example, several fisheries departments both manage landing sites and are supposed to perform official controls at these sites. There is a need to recognise these fundamental institutional dysfunctions and address them in the design of comprehensive food safety systems in the CARICOM member states. **The approach of the CAHFSA, requesting MS to nominate that national authorities for food safety, animal and plant health is a positive step in this direction. The current**

discussions regarding coordination between CAHFSA and CRFM are recommended to provide that future interventions in this field will be delivered via this new emerging framework, to ensure that development resources are appropriately focused within the food safety institutions responsible for risk management.

It is entirely valid that a capacity building project such as this establishes an impact assessment approach and develops and applies objectively verifiable indicators of achievement. This was achieved. However, the assessment of the baselines was compromised in this study by the limited nature of the exercise, being restricted to eliciting responses from attendees at two training courses, who were not able, in all cases, to provide adequate responses. **Since there are funds programmed for further SPS capacity building activities under the 11th EDF, any future intervention approach is recommended to be underpinned by a more comprehensive assessment of the baselines of SPS control capacity, using the impact assessment approach developed in this project, but employing data collection by direct visits to and interviews with the respective authorities.**

Finally, the impact assessment exercise identified a set of useful indicators, and has determined approximate baseline values. However, the sample and response bias arising from the survey methodology applied mean that the results cannot be considered as an entirely valid and reliable basis for future policy decision making by Governments and donors. In future, impact assessment studies are recommended to seek to avoid such sources of bias.

ANNEXES

ANNEX 1: TERMS OF REFERENCE

10th EDF Programme tilted "Support to the Forum of Caribbean States in the implementation of the commitmens undertaken under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary (SPS) Measures".

TERMS OF REFERENCE

Capacity Building of regulatory and industry stakeholders in CARIFORUM Countries in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

1.0 INTRODUCTION

The Forum of the Caribbean Group of African, Caribbean and Pacific (ACP) States (CARIFORUM) is the body that comprises Caribbean ACP States for the purpose of promoting and coordinating policy dialogue, cooperation and regional integration, mainly within the framework of the Cotonou agreement between the ACP and European Union, and also the CARIFORUM-European Community Economic Partnership Agreement (EPA). The region occupies a total area of 510,713 km^2 and comprises 4 large island states, 8 small islands states and 3 mainland states, all with a total population of 28 million (2014); 89% lives in Dominican Republic, Haiti, Jamaica, and Trinidad and Tobago. The countries are positioned around the Caribbean Sea with USA to the north, the Atlantic Ocean to the east, Central and South America to the west and south, respectively. The countries are predominantly small economies, depending mostly on agriculture and tourism, and are susceptible to natural disasters. Although there are many similarities in the grouping around culture and history, their geography may be very different and the present-day social and economic indicators such as population, per capita income, life expectancy, etc., vary enormously so much so that a distinction is drawn in membership identifying less developed countries (LDCs) for special treatment. The combined GDP of the CARIFORUM region in 2013 was approximately US$136.54 billion, with the Dominican Republic accounting for 45% of the total GDP[1].

The fisheries sector is important for CARIFORUM States as it provides employment, contributes to food security and export earnings. The marine capture sector is characterized as largely artisanal/small-sacle multi-gear fishery, where fishers utilize small boats and limited gear technology (fish traps, cast nets, and hook and line) to catch spiny lobster (Jamaica, The Bahamas), conch (Jamacia, The Bahamas, Belize, Dominican Republic), shrimp (Guyana, Suriname, Trinidad and Tobago), and finfish (all countries). The aquaculture sector in the region varies from experimental and small-scale for oyster (Jamaica and Belize) and sea moss (Antigua and Barbuda, Barbados, Dominica, Saint Lucia) to large scale shrimp and tilapia production (Jamaica, Belize, Dominican Republic). Direct employment in marine fisheries and aquaculture is an estimated 121,218 persons, with suppliers of goods and services and other indirect service 354,712 persons[2]. Total marine fish production is an estimated 181,653 MT (2012). Fish harvested are sold mainly on the domestic market while industrial catches are processed (limited to freezing and packaging) and exported. The total earnings from marine capture fisheries and aquaculture export was over USD 191 million in 2012[3].

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[1] *World Bank. www.worldbank.org*
[2] *Masters, J. 2014. CRFM Statistics and Information Report 2012 and http://www.codopesca.gob.do*
[3] *Masters, 2014, and Produccion pesquera para el periodo 2008 – 2011 por grupos explotados en MT (http://www.codopesca.gob.do)*

Regional cooperation in managing marine fisheries and aquaculture resources in CARIFORUM countries is promoted through CARICOM/CRFM. In February 2002, CARICOM established the Caribbean Regional Fisheries Mechanism (CRFM) to promote and facilitate the responsible utilization of the Region's fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region[4]. All CARIFORUM States, with the exception of the Dominican Republic are members of the CRFM. However, in October 2008, the CRFM and the Government of Dominican Republic signed a memorandum of Understanding to facilitate cooperation to ensure the sustainable development, utilization, conservation and management of the fish stocks and associated ecosystems occurring within the Caribbean Sea and adjacent areas, through, *inter alia*, the effective and efficient development and implementation of programme, projects and activities in these areas. The CRFM has a close, on-going relationship with the Dominican Republic in fisheries.

The objectives of the CRFM are: (a) the efficient management and sustainable development of marine and other aquatic resources within the jurisdiction of Member States; (b) the promotion and establishment of cooperative arrangements among interest States for the efficient management of shared, straddling or highly migratory marine and other aquatic resources; and (c) the provision of technical advisory and consultative services to fisheries divisions of Member States in the development, management and conservation of their marine and other aquatic resources.

The recently approved Caribbean Community Common Fisheries Policy[5] includes several provisions addressing Sanitary and Phytosanitary (SPS) issues in fisheries, including 3 of the 9 objectives (Article 4.3(b) (g) and (i)), and Article 18 on Marketing and Trade. In order to address SPS issues in marine fisheries and aquaculture, a plan is outlined in the CRFM's Strategic Plan[6] and Biennial work plan[7], which represents a consensus of Member States priorities, under Strategic Objective C: Sustainable Management and Use of Fisheries Resources. The overall aim of the SPS plan is to reduce post-harvest loss, improve the quality of fish and fisheries products, and improve infrastructure for marketing and trade of fish and fisheries products to meet domestic needs and international standards.

This Consultancy seeks to develop and provide support for capacity building for health and food safety (AHFS) in fisheries. Support is provided by the Sanitary and Phytosanitary Measures programme, one component of the 10th EDF Programme titled Support to the Caribbean Forum of ACP States in the Implementation of Commitments Undertaken Under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary Measures (SPS)"[8], executed by the Inter-American Institute for Cooperation on Agriculture (IICA), with the fisheries sub-component being coordinated by the CRFM. The project aims to facilitate CARIFORUM States to gain and improve market access by complying with Europe's Sanitary and Phytosanitary Measures (SPS) and to help CARIFORUM States to better develop their own regionally harmonized SPS measures and institutional capability to meet the requirements necessary to maintain and expand on the trade of fish and fish products locally, regionally, and internationally.

The CRFM is responsible for coordinating and implementing this action with general oversight and funding provided by IICA. Technical supervision, leadership and coordination to execute the activities related to this action are the responsibility of the CRFM.

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[4] CRFM, 2002. Agreement establishing the Caribbean Regional Fisheries Mechanism.
[5] CRFM, 2011. Agreement Establishing the Caribbean Community Common Fisheries Policy (www.crfm.int). The 51st Special COTED meeting (October 2014) confirmed that the CCCFP is an approved policy of the Community and should be applied as far as possible.
[6] CRFM, 2013. 2nd Draft CRFM Strategic Plan (2013-2021). CRFM Administrative Report. 39pp.
[7] CRFM, 2014. CRFM Biennial Work Plan and Budget, 1 April 2014 to 31 March 2016. CRFM Administrative Report. 24pp.
[8] IICA, 2014. 10th EDF SPS Proejct: Support to the Caribbean fourm of ACP States in the Implementation of Commitments Under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary Measures (SPS).

2.0 THE CONTRACTOR: Megapesca LDA.

3.0 OBJECTIVE

To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worlwide.

4.0 SCOPE OF WORK

The Contractor will work under the general direction of the 10th EDF SPS Project Management Team (Manager and International AHFS Specialist) and the Deputy Executive Director of the CRFM to build capacities at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products. This will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

The scope of work covers all activities necessary to accomplish the Expected Results stated. The main tasks/activities are as follows:

i. Attend an initial virtual briefing meeting with the Project Management Team and the CRFM Technical Team to discuss the objectives, activities, approach, expected outputs and any other issues related to the execution of the assignment that require clarification;

ii. Within five (5) days of the briefing meeting, the CONTRACTOR will prepare a report of the briefing meeting (inception report) and a work plan clearly identifying an outline and timelines for the execution of the capacity building;

iii. The main capacity building actions will include the following:

a) Development of at least 4 food safety operational manuals for field, laboratory, market and trade (import and export) to support the activities of designated persons and institutions responsible for the safety of fish and fish products in countries

This task will involve preparation, testing, refining , finalization and dissemination of food safety operational manuals for each major area of the industry chain requiring SPS quality management, covering skills and capacities for operations pertaining to harvesting, handling, production, processing, storage, transportation, marketing and trade (import and export) of fish and fish products intended for human consumption. Hence, the Contractor will develop, prepare, test, refine, finalize and disseminate food safety operational manuals (field/ environmental, laboratory, market/trade, SPS audit capacity) to support the activities of designated persons and institutions responsible for the safety of fishery products in countries.

- The Contractor, in consultation with the CRFM Secretariat, will facilitate and coordinate review of the manuals by the relevant national and regional stakeholders, and also receipt of their comments and recommendations for improving the manuals. Using the comments and recommendations received the manuals should be refined, and finalized.
- The manuals will be produced in 4 languages: English, French, Dutch and Spanish.

- The manuals covering laboratory testing procedures and food safety operations will be used as the basis for training personnel in keeping with the agreed programme for strengthening national and regional SPS monitoring activities.

b) Development and conduct of training programmes for improving official control and testing laboratory skills in SPS quality management for fish and fish products

The Contractor will develop and implement two interactive modular training porgrammes for improving food safety and laboratory operation skills in SPS quality management of fish and fish products, based on the operational manuals produced at (1), and taking into account SPS auditing capacity building needs.

The two training programmes, which are to be developed through consultation with the CRFM Secretariat and SPS experts within the region, including on site delivery of the training programmes in the region, should include an evaluation of the programme. The training materials developed should be CODEX compliant and aligned to the industry needs of CARIFORUM Countries, in keeping with and informed by the proposal on strengthening national and regional SPS monitoring programme developed under an earlier component of this project.

The training programmes should include training in microbiological laboratory testing.

It is also expected that the Contractor will supply suitable equipment for hosting the 2 training programme, which will remain with the beneficiary country hosting the training sessions.

c) Design of Impact Assessment Tools

The Contractor will develop two suitable impact assessment tools. The first impact assessment tool will be used by the Contractor to evaluate the impact of their two training programmes. The second impact assessment tools is for use by the CRFM Secretariat and aimed at evaluating the impact of the training programmes and available manuals on changes in knowledge, attitudes and practices as a result of the consultancy, and which may reasonably be expected to occur 1-2 years after completion of the assignment. These tools should be developed in consultation with the CRM Secretariat.

d) Design of communication and visibility products

The Contractor is expected to prepare information / knowledge products on the activities and achievements of the assignment, which could be used for wider project communication and visibility purposes. The number and types of products would need to be approved by the CRFM Secretariat at the outset.

In the conduct of the assignment the Contractor will be supported by the CRFM Secretariat, which will provide overall guidance on implementation of the assignment. The CRFM Secretariat will assign 2 staff (fisheries experts) who will work closely with the team at all times. The CRFM Secretariat will also assist in the circulation of manuals for review, and facilitate the finalization of all dcouments produced.

iv. At the end of each of the two main activities, a debriefing meeting will be held with the SPS Project Management Team and the Deputy Executive Director of the CRFM. The report of the activities will form the basis for the discussions.

5.0 EXPECTED RESULTS

Capacities built at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

6.0 DELIVERABLES

- Briefing report and a work plan which identifies the project milestones, time schedule and production of deliverables for the duration of the assignment.
- Eight (8) Manuals on food safety (6) and laboratory (2) operations for public and private sector (hard copies and equivalent electronic versions – English – 100 copies; Spanish, French and Dutch – 20 copies each).
- SPS food safety and laboratory training curricula (a curriculum for fishery sector operations and a curriculum for fishery products laboratory testing).
- Delivery of two (2) training workshops.
- Training equipment (to be agreed):
- Laboratory Equipment (to be agreed):
    - 15 sets inspection equipment (thermometers/chlorine test kits)
    - 1 demonstration unit histamine analysis
    - 1 demonstration unit rapid microbial tests
    - 1 demonstration unit ELISA test for veterinary medicine residue screening (or similar, to be agreed)
- Interim mid-term report of progress of the action including execution of the Training Workshop (inclusive of the equipment supplied)
- Reports (x2) on training events, including evaluation of impact of training sessions, and an account of the training equipment provided.
- Videos (MP4) of training courses (edited with PowerPoint and practical demonstrations).
- Two (2) impact assessment tools, including monitoring indicators in respect of competent authority and laboratory performance.
- Knowledge Products including: Two regional newsletters, Three press releases, One Information Poster.
- Final Technical Report, documenting aims, methods, findings and recommendations, and including all final outputs.
- Final Financial Report.

7.0 ROLES AND RESPONSIBILITIES

The CONTRACTOR is responsible for execution of the main capacity building ACTIONS and accomplishing the Expected Results and Deliverables as outlined above.

The CONTRACTING PARTY, through the CRFM Secretariat in Belize, will provide the following assistance to the CONTRACTOR in a timely manner:

- Facilitate requests for relevant data concerning fishery sector and sanitary controls in Member States
- Facilitate obtaining stakeholder responses to draft manuals and training course content
- Facilitate trainee recruitment.

8.0 REPORTING

The CONTRACTOR will prepare an inception briefing report, progress report and a final report. The progress report will be submitted mid-term of the contractual period. The final technical report should include methodologies used to deliver the various outputs, with lessons learned and recommendations for follow up action, and include all products. The report, including the manuals and training curricula, should be produced in publisher-ready versions in Microsoft Word for Windows format and submitted electronically to the SPS Project Management Team and the Deputy Executive Director of the CRFM Secretariat in Belize.

9.0 LOGISTICS

All logistical arrangements pertaining to travel by the CONTRACTOR and workshop participants are the responsibility of the CONTRACTOR.

10.0 DURATION

The assignment will be undertaken from August 29, 2016 to January 13, 2017.

ANNEX 2: INCEPTION REPORT

INCEPTION REPORT

Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

Conch aquaculture production in the Caribbean
http://www.caicosconchfarm.net/

CONTENTS

1 INTRODUCTION

This Report is submitted by Megapesca Lda of Portugal, a food and fisheries consultancy firm established in 1994.

The report comprises the inception report for the Project "Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade" issued by the Inter-American Institute for Cooperation on Agriculture (IICA) under the EU funded project "10th EDF Sanitary and Phytosanitary Measures Project". The Caribbean Regional Fisheries Mechanism (CRFM), based in Saint Vincent and the Grenadines is nominated by IICA for the coordination of the technical implementation of the project.

The project commenced on signature of the contract on 26th August 2016, and is expected to finish in January 2017. This Inception Report follows the holding of an Inception Meeting held by Skype on 15th September 2016, attended by the consultants, and representatives of IICA and the CRFM Secretariat.

2 DESCRIPTION OF THE INTERVENTION

2.1 Objective

The objective of the project, according to the ToR is to:

To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

2.2 Project results

The project aims to:

- Develop at least 8 food safety operational manuals for field, laboratory, market and trade (import and export) to support the activities of designated persons and institutions responsible for the safety of fish and fish products
- Develop training programmes for improving official control and testing laboratory skills in SPS quality management of fish and fish products, (including the supply of relevant equipment)
- Deliver the training programmes in short courses in the region
- Design and implement Impact Assessment Tools
- Design relevant communication and visibility products

The expected result is that capacities will be built at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

3. INCEPTION ACTIVITIES AND FINDINGS

Since the commencement of the project the following activities have been carried out during the inception period.

3.1 Team and inputs

The project team of key experts has been mobilised, as proposed previously:

- Team leader and Food Safety Specialist (Key Expert 1) for a total of 54 fee days
- Specialist in Food safety testing laboratory management and ISO17025 (Key Expert 2) for a total of 44 fee days

3.2 Preparation for issuance of subcontracts

Negotiations were held on all service and supply contracts required to complete the action. Several contracts were signed, and the remainder are negotiated and in place, and subject to completion of details ready for signature.

3.3 Identification of specific sources of information for training manuals

The consultants have commenced work collating the documents from relevant previous projects which have undertaken intervention activities in CARIFORUM Member States. A list is provided in Annex 4.

Following preliminary discussions, the consultants have drafted contents pages for the training manuals, for the approval of the IICA/CRFM.

3.4 Identification of beneficiaries/participants

Dates and location of training have been agreed.

The CRFM has written to the parent Ministries of all potential beneficiaries/participants. These include Competent Authorities responsible for official controls in the fishery sector and laboratories responsible for testing of food safety parameters of fishery products. The recipients are requested to nominate named individuals to participate in the training activities by the 23rd September 2016. On receipt of this information the consultants will commence making the specific travel arrangements.

3.5 Review of proposed workplan

The workplan set out in the consultant's proposal was reviewed, discussed with the beneficiary and adjusted. This has resulted in confirmation of the implementation activities, the associated logistical arrangements and the development of the final work plan as set out below.

4 IMPLEMENTATION ACTIVITIES

The following sets out the remaining implementation steps to be undertaken by the consultants.

4.1 Remote technical consultations with key stakeholders

From the home office, the team will undertake technical consultations using Skype and email with the course participants identified by the CRFM. As far as is possible, the following questions will be clarified from a questionnaire and interviews with the proposed participants, and from published sources.

Competent Authorities

- Profile of fishery sector (fleet, catches, processing establishments, aquaculture trade and employment)
- Staff resources (number/qualifications/level/subject)
- Qualifications of staff (level/subject)
- Dimensions of activity (no. of inspections of vessels/establishments/aquaculture)
- Main food safety risks of concern

Testing laboratories

- Identification of laboratories
- Test parameters offered and methods (official / rapid)
- Accreditation and scope of accreditation
- Laboratory staff resources (no/qualifications / level / subject)

A draft technical questionnaire for distribution to participants is shown in Annex 3. This will help the team to understand the detailed needs for capacity building, identify specific technical issues / areas for strengthening, and develop improved understanding of modalities and help in the finalisation of the technical operational manuals and associated training programmes and materials.

4.2 Drafting of food safety operational manuals

On completion of the consultations with stakeholders the consultants will undertake the development of the first draft of the required Food Safety Operation Manuals.

It is proposed that the first drafts in English will be submitted to CRFM Secretariat and the contact persons in the relevant institutions at the latest by the 14 October 2016, with a request to submit comments by the 4 November 2016.

However, if they become available earlier they will be distributed to give more time for comment. The comments provided by beneficiaries will be taken into account in the editing of the final drafts.

Final draft copies of the manuals will be produced for distribution to participants during the training. This number is not included in the numbers to be produced in the final print run (see 4.7).

Final checking, translation and printing of the final materials will be undertaken after the delivery of the training courses.

4.3 Develop curriculum and training programme

Whilst still at the home office the consultants will prepare their respective training courses, based on the manuals developed. Two 5-day training courses will be developed:

- Fishery products testing laboratory manuals and their applications (aimed at managers and analysts from testing laboratories)

- Fishery sector operations manuals and their application (aimed at officers of competent authorities responsible for official sanitary controls for fishery products).

The objective of the training courses designed by the consultants will be to:

- present the content of the manuals
- ensure that the participants understand the scientific principles contained therein; and
- demonstrate application of selected analytical / inspection methods in practice

The curricula for the courses (setting out the timetable of lectures, titles and summary of content) will be presented in the Interim Progress report.

Course materials will be prepared in MS PowerPoint. Courses will include practical demonstrations using the equipment supplied.

4.4 Procurement of laboratory and training equipment

Negotiations with Equipment suppliers have been undertaken and completed. Proposals for procurement of the following equipment have been obtained:

	Equipment	Suppliers
1	15 x Lovibond comparators (potable water testing)	OilWater Industrial - Serviços e Representações, S. A Rua dos Remolares 14, 3º - 1200-371 Lisboa Tel: +351 219 537 915 Fax:+351 213 469 078 www.oilwater.pt
2	1 x Histamine analysis (Rapid methods)	BIOLAN Laida Bidea Edificio 409 · Parque Tecnológico de Bizkaia 48170 Zamudio , Bizkaia SPAIN www.biolanmb.com
3	15 x Thermometers	AMBIFOOD Edifício Porto Magnum Rua Dominguez Alvarez, nº 44, 4.16 4150-801 PORTO www.ambifood.com
4	1 x Video and audio recording equipment	Proactive (UK) Ltd. Unit 1 Eastman Way Hemel Hempstead Hertfordshire HP2 7DU UK Web: www.proav.co.uk
5	RIDA®STAMP Total Kit RIDA®STAMP Salmonella Kit Compact Dry TC (Total Count) Compact Dry SL (Salmonella) RIDASCREEN® Histamin (enzymatic) Premi®Test 25	R-Biopharm Latinoamérica V. de Obligado 2943 (1429) CABA 011-4701-6262

Pro-forma invoices for the equipment to be shipped to St. Vincent and the Grenadines are included in Annex 1. These may be adjusted slightly to account for minor items not yet specified. All items except No. 5 and reagents for No.2 will be shipped directly to the consignee nominated by IICA.

This is as follows:

Caribbean Regional Fisheries Mechanism Secretariat
Top Floor, Corea's Building
Halifax Street
Kingstown
St. Vincent and the Grenadines

Attention:
Dr. Susan Singh-Renton
Deputy Executive Director
Tel: +1 784 457 FISH
Fax: +1 784 457 3475
Email: susan.singhrenton@crfm.net

IICA is also requested to specify import procedures (formalities, documentation requirements and specific wording required)

Orders will be despatched by air as soon as possible (CIF) to arrive in Saint Vincent and the Grenadines by the end of October at the latest.

The consignee will be responsible for timely implementation of customs clearance procedures.

Shipping documents will be couriered to the consignee and copied to IICA for the issue of the appropriate paperwork for import. The shipping documents will be prepared in English in order to obtain Customs clearance in St. Vincent and the Grenadines.

The consultants undertake to refund customs clearance costs and brokerage fees; CRFM will arrange for receipts to be issued in the name of Megapesca Lda.

The receiver should agree to allow the use of the equipment by the consultants for the duration of the training course.

IICA and / or CRFM will be requested to supply letters of authorisation to support the shipping and carriage of equipment.

Supplies of reagents and test kits containing temperature sensitive materials will be carried by the trainers in their luggage to ensure that they retain their activity and avoid the need for chilled storage on arrival.

4.5 Delivery of two one-week training courses

4.5.1 Venue and dates

It is confirmed that the training courses will be delivered by the consultants at the Beachcomber Hotel, Saint Vincent on the following dates:

Location	Beachcomber Hotel, Villa Beach, Saint Vincent and the Grenadines
"*Fishery products testing laboratory testing manuals and their applications*":	Monday, 28 November to Friday, 2 December 2016
"*Fishery sector operations manuals and their application*"	Monday, 5 December 2016 to Friday, 9 December 2016

4.5.2 Participants

The CRFM Secretariat has sent a letter to all participating Ministries and IICA representatives within the region, asking them to nominate relevant participants by 23 September 2016. On receipt of the list of participants the consultants will contact them to make the specific arrangements, once the Consultant has confirmed that formal Ministerial-level authorization has been granted. An information note and information required from participants is set out in Annex 2.

This will be sent to the nominated persons as soon as their contact details are supplied to the consultants.

4.5.3 Course arrangements

The following arrangements will be made, and associated costs covered by the consultants.

- Travel and subsistence for consultants
  - Travel and subsistence for overseas participants, comprising:
    - Return economy Air ticket
    - Transport to and from the airport in St Vincent
    - Hotel Room, single occupancy
    - Visa costs (if any) reimbursed against an original receipt
    - Cash per diem (US$60/night) to cover all meals (not included in Catering below) and incidentals
  - Travel and subsistence for participants from the Grenadines comprising:
    - Reimbursal of the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (ferry, bus ticket, taxi receipt or similar).
    - Hotel Room, single occupancy
    - Cash per diem (US$60/night) to cover all meals (not included in catering below) and incidentals
  - Travel for participants from St Vincent comprising:
    - Reimbursal of the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (bus ticket, taxi receipt or similar).
- Catering for all participants on the training course (1 morning soft drinks and coffee break, plus lunch on each day of the training course)
- Hire of training rooms / for 15 trainees)
- Printing of workshop materials
- Video recording of the training lectures and practical demonstrations
- Video editing (to include PowerPoint and audio presentations) and preparation of videos suitable for web-distribution

4.5.4 Laboratory training (including microbiological)

Representatives of BIOLAN (supplier of rapid histamine test methods) and BIOPHARM (supplier of rapid microbiological test kits) will attend the training course and train participants in the use of their

equipment and kits. The temperature sensitive components will be transported in the luggage of the trainers and no local chilled storage will be required.

4.5.5 Video recording

The training will be professionally video-taped to produce a high-quality edited set of video files (nominally 60 hours) for future use by the client. A sub-contract for this service has been established with Frost Studio, York, UK.

The training equipment (video cameras, audio system, projector and screen) will be purchased in the EU and donated to:

Caribbean Regional Fisheries Mechanism Secretariat
Top Floor, Corea's Building
Halifax Street
Kingstown
St. Vincent and the Grenadines

4.5.6 Impact assessment

The consultants will assess the impact of the training courses through an evaluation exercise completed by the participants to provide an indication of relevance, validity and quality of course content and delivery. A draft evaluation tool for this purpose will be presented.

4.6 Translation of the materials

The consultants have identified specialists who will undertake the translation of the manuals into three languages: Spanish, French and Dutch. They all have good knowledge of the subjects concerned. The translation will be launched as soon as the first draft of the documents is prepared.

4.7 Printing of the manuals

The consultants will identify a suitable publisher and arrange for the printing, binding and delivery of training manuals. The following number of hard copies is to be provided (as set out in the ToR). This number does not include draft copies provided to participants in the training course.

English	100
Spanish	20
French	20
Dutch	20

The CRFM Secretariat has requested that the manuals will be shipped to:

CRFM Secretariat
Top Floor, Corea's Building
Halifax Street, Kingstown
St. Vincent and the Grenadines
.....
Tel: +1 784 457 FISH
Fax: +1 784 457 3475
Contact:
Dr. Susan Singh-Renton
Deputy Executive Director
susan.singhrenton@crfm.net

4.8 Development of impact assessment tools

The experts will, during the course of the project, prepare two impact assessment tools.

4.8.1 Training evaluation tool

The first impact assessment tool will be a training evaluation tool, to allow an assessment of the relevance, effectiveness, level and quality of delivery of training activities. This will be applied by the consultants in the training courses.

4.8.2 Key Performance Indicators

The second impact assessment tool will seek to define the Key Performance Indicators (KPIs) for the operations of a fishery sector sanitary control system, including the sampling and testing regime and demonstrate the effectiveness of the intervention in terms of changes in knowledge, attitude and practices.

The approach to establishing KPIs is considered to be essential to guide the regional development of effective control systems. Measuring quantitative performance provides regional and national authorities with a clear indication of what is required to be done to strengthen control capacities. Examples of KPIs applied in food safety systems generally include some or all of the following, which will be considered/adapted as required.

Regional performance indicators

- Proportion of countries / territories with access to the EU market for fishery products
- Proportion of countries / territories preparing annual control plans & reports
- Annual average no. of EU Rapid Alerts (RASFF system)
- Proportion of fishery production subject to sanitary control
- Number of inspectors per 1,000 tonnes supply (production plus imports)
- No. of testing laboratories accredited to ISO17025

For each state / territory performance:

- No. of vessels under sanitary control/total no. of vessels
- No. of processing establishments under sanitary control / total no. of establishments
- No. of inspections conducted / year
- No. of non-compliances noted / No. of establishments
- No. of certificates declined / no. certificates requested (for import and export)
- No. of relevant tests conducted for official control / no. of testing laboratories

These indicators will be expressed formally in the report, for example, setting out in tabular form:

- name of indicator
- definition (in quantitative terms)
- units
- sources of data

The consultants will also design a data form for submission by relevant testing laboratories and competent authorities for the generation of the data (for example via an annual survey which could be implemented by the CRFM).

Participants to the training course will be requested to complete the data form in advance of the training course. The data will contribute to the determination of the baseline measure for the impact assessment tool. Additional questions will be designed concerning changes in the knowledge, attitude and practices in relation to official control and laboratory performance.

Monitoring of the indicators in future and comparison with the baseline would then provide a measure of the impact of the intervention project.

4.9 Development of information / knowledge products

The consultants will prepare knowledge products for use in CRFM communications. It is proposed to develop specific products as set out in this section.

4.9.1 Development of a regional quarterly newsletter on fish sanitary controls.

This is proposed to be a direct email newsletter which will include relevant articles/news drawn from *inter alia*:

- Megapesca's FishFiles Lite (see http://www.megapesca.com/aboutfishfiles.asp)
- Fish Inspector, a quarterly FAO publication (see: http://infofish.org/v2/index.php/the-fish-inspector)
- IAFI newsletters (International Association of Fish Inspectors - see http://www.iafi.net/)

The articles developed will, as far as possible, be selected and edited to reflect the regional context.

The consultants propose to develop 2 such newsletters during the course of the consultancy, for dissemination by the IICA or the CRFM (as appropriate). CRFM Secretariat and / or IICA will be briefed on the sources with a view to sustainable production in the future.

4.9.2 Preparation of press releases

The consultants will prepare **three** press releases presenting information regarding the consultancy and its activities, emphasising and the importance of SPS measures in ensuring an economically sustainable fishery sector in the Caribbean region, and contribution of the 10th EDF Sanitary and Phytosanitary Measures (SPS) Project.

It is proposed that these will address issues relating to the:

1. The launch of the consultancy
2. The training action and the manuals
3. The closure of the consultancy summarising project outputs and the impact assessment

4.9.3 Preparation of an infographic

The consultants will prepare an infographic setting out relevant information and data regarding SPS issues addressing the fishery sector in the Caribbean region, as well as information regarding sanitary controls for fishery products and the laboratory testing of fishery products. It may also draw on the monitoring indicators set out in 4.8.2 above.

The infographic will be targeted at a level suitable for the general public.

4.10 Reporting requirements

Reports will be produced by the consultants in accordance with the terms of reference, and will be as follows:

1. 6 Food safety operations manuals
2. 2 Laboratory operations manuals

3. Training curriculum and training materials for 2 training programmes: fishery and aquaculture sector sanitary control operations, and fishery products laboratory testing
4. Procurement report on equipment supplied
5. Reports (x2) on training events, including evaluation of impact of training sessions
6. Videos (MP4) of training courses (edited with PowerPoint and practical demonstrations)
7. Impact Assessment Tool, including monitoring indicators in respect of competent authority and laboratory performance and impact of the consultancy
8. Two regional newsletters
9. Three press releases
10. One Infographic
11. Interim report
12. Final Technical Report, documenting aims, methods, findings and recommendations, and including the specific deliverables noted at 1-10.

5 WORKPLAN AND DELIVERY SCHEDULE

The project inputs and outputs will be delivered over the period from date of signature of contract until 13 January 2017, according to the following schedule.

Key Date	Activity / Deadline
26 August 2016	Contract signature
15 September 2016	Inception Skype briefing meeting
19 September 2016	Submission of Inception report
	Commencement of drafting of manuals
23 September 2016	Deadline indicated in formal CRFM Secretariat communication requesting training participant list
	Commencement of logistical arrangements of participant travel
	Circulation of questionnaire to participants: • data on controls / laboratories • data required for logistical arrangements for training
03 October 2016	Receipt of comments / approval of Inception report (2 weeks after IR submission)
	Ordering of all equipment; shipment to Saint Vincent
07 October 2016	Sending of questionnaire to training participants
17 October 2016	Delivery of draft Food safety operations and Laboratory operations manuals to CRFM
	Distribution of manuals to participants for comment
	Submission of manuals for commencement of translation
	Preparation of Press Release 1 (Project activities)
07 November 2016	Deadline for submission of comments / questionnaires from participants
	Revisions and finalisation of manuals
	Preparation of Training curriculum and training materials for 2 training programmes
15 November 2016	Submission of Interim Report (to include draft training curricula,

Key Date	Activity / Deadline
	training manuals and training materials)
	Submission of Draft Regional Newsletter 1
24 November 2016	Travel of consultants / AV team to Saint Vincent
25 November 2016	Final preparations on site
28 November 2016	Training course: Fishery products testing laboratory testing manuals and their applications
	Comments / Approval of Interim Report by CRFM
02 December 2016	End of training course; Course evaluation
05 December 2016	Training course: Fishery sector operations manuals and their application
09 December 2016	End of training course; Course evaluation
	Formal handover of donated equipment (training and testing)
	Preparation of Press Release 2 (Training outcomes)
10 December 2016	Departure of consultants from Saint Vincent
16 December 2016	Finalisation of manuals and printing
30 December 2016	Submission of draft final technical and financial report
	Packing and sending of manuals to CRFM
	Submission of report on training and equipment supplied
	Preparation of Press Release 3 (Project outputs)
	Submission of Draft Regional Newsletter 2
	Submission of infographic
	Submission of report on Impact Assessment Tool
13 January 2017	Submission of edited video files
	Submission of Financial Report
	Deadline for submission of comments on final technical report and deliverables
31 January 2017	Submission of Final Technical Report, final financial report and all finalised deliverables

Appendix 1: Pro-Forma Invoices for Laboratory and Training Equipment

Ambifood, LDA

Rua Dominguez Alvarez, nº. 44, 4.16
4150-801 PORTO Porto
Telefone:229963069 Fax: 229940882
geral@ambifood.com
www.ambifood.com
Contribuinte: 505400057

Fatura Proforma Nº OU 2016A7/63

Outro ORIGINAL

Página 1 de 3

Exmo.(s) Sr.(s)
MEGAPESCA FORMAÇÃO PROFISSIONAL E PRESTAÇÃO DE SERVIÇOS
R GAGO COUTINHO N 11
VALADO DE SANTA QUITERIA
2460-207 ALFEIZERAO

Data de emissão :	Condições de pagamento	Vencimento em:
13.10.2016	Pronto Pagamento	13.10.2016

Cliente Nº	Vª Contribuinte:	Transporte
2854	503215708	

Vl Req.

Referencia	Descrição	Iva	Qt.	Preço Unitário	Desc1	Desc2	Total
31.1020	DIGITAL THERMOMETER WITH EXTERNAL PROBE P300		15,0	68.00 €			1,020.00 €
D+TEXP	FREIGHT, EXPORT & INSURANCE		1,0	180.00 €			180.00 €

TAX EXEMPTION ACCORING PT CIVA ART. 14, NR. 1

CONSIGNEE:

CARIBBEAN REGIONAL FISHERIES MECHANISM

TOP FLOOR, COREA'S BUILDING

HALIFAX STREET

KINGSTOWN - ST. VICENT AND THE GRENADINES

Software PHC - Processado por programa certificado nº 0006/AT (2016/0627)-Este documento não serve de fatura

Taxa	Base de Incidência	Valor do I.V.A.
23,00%		
13,00%		
6,00%	1,200.00	
21,00%		
20,00%		

Total Ilíquido :	1,200.00
Portes :	
Desconto Financeiro :	
Desconto Comercial :	
Base de Incidência de I.V.A.	1,200.00
Total de I.V.A.	
TOTAL em EUROS	1,200.00

Motivo Isenção de Imposto Isento Artigo 14.º do CIVA (ou similar)

1,200.00: one thousand two hundred euros

Local de carga	Nº Morada
Local de descarga	Nº Morada
Hora de Carga	15:23
Data Entrega Sara	13.10.2016

Em caso de litígio relativo a este Documento, o foro competente será o da comarca do Porto, com expressa renúncia a qualquer outro.

Os artigos/serviços constantes deste documento permanecem propriedade da Ambifood até boa cobrança, tendo sido colocados à disposição do adquirente 13.10.2016

Conserv./Reg.Com.Porto Nº Matrícula:505400057
Capital Social 45.000,00€

NIB: 0046 0107 00000250032 45 IBAN: PT50 0046 0107 0000 0250 0324 5 SWIFT CRBNPTP
NIB: 0010.0000.24818810001.20 IBAN: PT50.0010.0000.2481.8810.0001.20 SWIFT BBPIPTP

PROAV
PROACTIVE BROADCAST SOLUTIONS

Proactive (UK) Ltd.
Unit 1 Eastman Way
Hemel Hempstead
Hertfordshire
HP2 7DU

Email: sales@proav.co.uk
Web: www.proav.co.uk
Tel: 01442 292929
Tel: 01527 911379
Fax: 01442 292930

QUOTATION

Invoice Address:

Megapesca Lda
Valado de Santa Quitéria
ALFEIZERÃO 2460-207
PORTUGAL

Quote Number: 26943

Delivery Address:

Caribbean Regional Fisheries Mechanism
Secretariat
FAO: Susan Singh-Renton
Top Floor, Corea's Building
Halifax Street,KINGSTOWN
ST. VINCENT and the Grenadines

Account Code:	POR157	**Contact:**		**Customer Ref. No:**	
Cust VAT No:		**Contact Number:**		**Quote No:**	26943
Terms:	Advance Payment	**E-Mail Address:**		**Issue Date:**	12/09/16

Qty	Item no.	Description	Unit Price	VAT %	Amount
	Text Line	**Package 4**			
2.00	GY-HM170E	JVC GY HM170	890.00	0.00	GBP 1,780.00
2.00	CN-1051	Proactive Lens Cleaning Kit	0.00	0.00	0.00
2.00	PCC	Proactive Cleaning Cloth	0.00	0.00	0.00
2.00	S-8823	Swit S-8823 High Capacity Battery	60.00	0.00	GBP 120.00
2.00	SDSDXPA-032G-X46	Sandisk SDSDXPA-032G-X46 Extreme Pro SDHC 32GB - 95MB/s Class 10 UHS-I	0.00	0.00	0.00
2.00	EG03A2	E-Image EG03A2 Aluminium Tripod Kit (EG03A2)	160.00	0.00	GBP 320.00
2.00	Oscar S50	E-Image Oscar S50 Small Camcorder Bag	65.00	0.00	GBP 130.00
2.00	NTG1	Rode NTG1 Microphone	140.00	0.00	GBP 280.00
2.00	C-XLQM/XLQF-1	Kramer C-XLQM/XLQF-1 XLR (M-F) Cable 0.3M (30cm)	0.00	0.00	0.00
2.00	HD 201	Sennheiser HD 201 Professional Closed-Back Headphones	0.00	0.00	0.00
2.00	EW 112-P G3 GB	Sennheiser EW 112P G3 GB Portable wireless microphone system	300.00	0.00	GBP 600.00
2.00	Boompole	Rode Boompole Telescopic Boom Pole	65.00	0.00	GBP 130.00
2.00	C-XLQM/XLQF-15	Kramer C-XLQM/XLQF-15 XLR (M-F) Cable 4.6M	0.00	0.00	0.00
2.00	NTSM4	Rode NTSM4	0.00	0.00	0.00
2.00	WS6	Rode WS6 Windshield	0.00	0.00	0.00
	Text Line	**Package 1**			

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Proactive (UK) Ltd.
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Hemel Hempstead
Hertfordshire
HP2 7DU

Email: sales@proav.co.uk
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Tel: 01527 911379
Fax: 01442 292930

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Invoice Address:

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Top Floor, Corea's Building
Halifax Street,KINGSTOWN
ST. VINCENT and the Grenadines

Account Code:	POR157	**Contact:**		**Customer Ref. No:**	
Cust VAT No:		**Contact Number:**		**Quote No:**	26943
Terms:	Advance Payment	**E-Mail Address:**		**Issue Date:**	12/09/16

Qty	Item no.	Description	Unit Price	VAT %	Amount
1.00	GY-HM170E	JVC GY HM170	980.00	0.00	GBP 980.00
1.00	CN-1051	Proactive Lens Cleaning Kit	0.00	0.00	0.00
1.00	PCC	Proactive Cleaning Cloth	0.00	0.00	0.00
1.00	S-8823	Swit S-8823 High Capacity Battery	0.00	0.00	0.00
1.00	SDSDXPA-032G-X46	Sandisk SDSDXPA-032G-X46 Extreme Pro SDHC 32GB - 95MB/s Class 10 UHS-I	0.00	0.00	0.00
1.00	PMD661	Marantz PMD661 MKII	395.00	0.00	GBP 395.00
3.00	SDSDXPA-032G-X46	Sandisk SDSDXPA-032G-X46 Extreme Pro SDHC 32GB - 95MB/s Class 10 UHS-I	20.00	0.00	GBP 60.00

GBP Account
Bank: HSBC Account Name: Proactive UK Ltd
Account Number: 42361108 Sort Code: 40-40-01
IBAN: GB02MIDL40400142361108 BIC: MIDLGB2110W

Euro Account
Bank: HSBC Account Name: Proactive UK Ltd
Account Number: 400515 Sort Code: 40-05-15
IBAN: GB59MIDL40051576794693 BIC: MIDLGB22

Sub Total	GBP 4,795.00
Delivery	600.00
VAT Total	0.00
Total	**5,395.00**

Warranty: New Equipment: as specified by manufacturer.
Second Hand Equipment: 3 months parts and labour.
Goods remain the property of Proactive UK Ltd until payment is recieved in full.

BIOLAN

DELIVERY ADDRESS:
Caribbean Regional Fisheries Mechanism Secretariat,
Top Floor, Corea's Building,
Halifax Street,
Kingstown,
St. Vincent and the Grenadines.
Attention: Dr.Susan Singh-Renton
Deputy Executive Director,
Tel: +1 784 457 FISH -Fax: +1 784 457 3475
Email: susan.singhrenton@crfm.net

INVOICED TO:

MEGAPESCA LDA.
Rua Gago Coutinho 11
Valado Sta. Quitéria
2460207 Alfeizerao
PORTUGAL

Invoice **PROFORMA 1010(1)**
Date **10/10/2016**
VAR **PT 503 215 708**

Ref.	Description	Units	Price	Total
BIOFISH	BIOFISH 300-003 (HISTAMINE AOAC) Serial number: 16022	1	10,123.00 €	10,123.00 €
BIOLAB	BIOLAB BIOFISH (Pipettes/pump/bottles)	1	835.00 €	835.00 €
VAR	SHIPPING	1	420.00 €	420.00 €
	Air Shipment Origin; Spain			
	The supply of these goods is made under the 10th European Development Fund Sanitary and Phytosanitary (SPS) Project, implemented by the Inter-American Institute for Cooperation in Agriculture, and is subject to the terms of the Cotonau Agreement between the EU and African Caribbean and Pacific countries.			

Payment terms: Bank Transfer **NET AMOUNT**
IBAN: ES31 0182-0031-58-0208503620
SWIFT: BBVAESMMXXX

Subtotal: **11,378.00 €**
VAT 0% **0.00 €**
Total: **11,378.00 €**
Eleven thousand three hundred seventy-eight euros

Appendix 2: Training course Information for Circulation to Participants

Training on Fishery products testing laboratory testing manuals and their applications
Draft Covering letter

Dear….

10th EDF Sanitary and Phytosanitary (SPS) Project: Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

I am pleased to inform you that the **10th EDF Sanitary and Phytosanitary (SPS) Project,** implemented by the Inter-American Institute for Cooperation o n Agriculture (IICA) has contracted Megapesca Lda of Portugal to implement the above contract. A major aim of the project is to prepare two manuals concerning laboratory testing for food safety parameters in fishery products, and six manuals concerning official controls for fishery products.

We understand from our project implementing partners (the Caribbean Regional Fisheries Mechanism) that you have been nominated to participate in the following activity, which will introduce relevant manuals to participants from the region:

Training course on "Fishery products testing laboratory testing manuals and their applications":
Monday, 28 November to Friday, 2 December 2016
Venue: Beachcomber Hotel, Saint Vincent and the Grenadines

I attach an information sheet which provides more details of the training course setting out the objectives, content and how you will benefit from the course, which will be delivered by recognised international experts. The project will provide economy flights, accommodation and a per diem for participants in the workshops.

I also attach participant questionnaire and list of information requirements which we ask that you complete and send to this office (rowena@megapesca.com) by 4 November 2016. This will allow us to make the necessary logistical arrangements on your behalf.

We would also ask you to complete and submit the attached questionnaire regarding the technical organisation of your work. This will help us to focus the content of the manuals on precise regional needs. We expect to circulate the manuals for your review and comment in due course.

Many thanks for your cooperation and we look forward to meeting you in Saint Vincent and the Grenadines in due course.

Yours sincerely

Megapesca Lda.

Course details: Fishery products testing laboratory testing manuals and their applications

Title of course	**Fishery products testing laboratory testing manuals and their applications**	
Location	Beachcomber Hotel, Villa Beach, Saint Vincent and the Grenadines	
Date	Monday, 28 November to Friday, 02 December 2016	
Principal resource person	Dr. Christine Froese	
Language of delivery:	English	
Objectives	The objective of the course will be to: 1. Review testing methods and requirements for key fish safety parameters, as set out in training manuals developed under the project 2. Demonstrate modern rapid methods of analysis (chemical and microbiological) 3. Develop an awareness of laboratory quality management procedures and accreditation requirements (ISO17025)	
Participant profile	The course should be attended by staff of testing laboratories engaged in assessing chemical and microbiological food safety parameters applicable to fishery products, in either a managerial or an analytical role. The course will assume a sound knowledge of laboratory procedures	
Logistics	• The project will book and pay directly the following costs: Travel and subsistence for overseas participants, comprising: • Return economy Air ticket • Transport to and from the airport in St Vincent • Hotel Room, single occupancy • Visa costs (if any) reimbursed against an original receipt • Cash per diem (US$60/night) to cover all meals (not included in Catering below) and incidentals Travel and subsistence for participants from the Grenadines comprising: • Reimbursal of the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (ferry, bus ticket, taxi receipt or similar). • Hotel Room, single occupancy • Cash per diem (US$60/night) to cover all meals (not included in catering below) and incidentals Travel for participants from St Vincent comprising: • Reimbursal of the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (bus ticket, taxi receipt or similar). Catering for all participants on the training course (1 morning soft drinks and coffee break, plus lunch on each day of the training course)	
Indicative programme / content	AM	PM
Monday, 28 November	Introduction to the manuals on microbiological testing methods	Introduction to the manuals on microbiological testing methods
Tuesday, 29 November	Introduction to the manuals on chemical testing methods	Demonstration of BIOLAN histamine testing system
Wednesday, 30 November	ISO17025 General requirements for the competence of testing and calibration laboratories and accreditation steps	Demonstration of BIOPHARM rapid microbiological test kits (provisional)
Thursday, 01	Demonstration of BIOPHARM	Demonstration of BIOPHARM rapid

December	rapid test kits (Vibrio, residues) (provisional)	microbiological test kits (provisional)
Friday, 02 December	Laboratory business planning	Discussion session Evaluation Award of certificates

Participant questionnaire and information requirements

The nominated participant is requested to provide the following documents:

1. Completed Participant Information Form (see below)
2. Scan of passport details page (the page with photograph)
3. Scan of a letter or an email of "Permission to attend the workshop" from the relevant superior / manager; it should contain the participants name and dates of the workshop
4. E mail confirming the participants' willingness and availability to attend the Workshop.

Participant Information:

1. Family Name:	
2. First names:	
3. Date of birth:	
4. Nationality:	
5. Home Address:	
6. Telephone Number:	
7. Mobile Number:	
8. Work Organisation	
9. Work Organisation Address:	
10. Passport Number:	
11. Passport Expiry Date:	
12. Name of the International Airport closest to your home town:	
13. Details of how you can travel to this International Airport:	

14. Do you have any special dietary requirements (please specify):	
15. Name / relation of person to contact in event of an emergency and contact detail: (Address, Tel / Email)	

Support to be provided

Upon receipt of all the documents in the list of requirements, Megapesca Lda will, for participants **from outside of Saint Vincent and the Grenadines:**

- Suggest flights to attend the workshop and upon agreement of the flights will provide an economy return ticket to the participant.
- Provide and pay for a standard single occupancy hotel room for all the nights the participant is on the island of St Vincent on Workshop business.
- Provide transport for participants from and to the airport on the day of arrival and the date of departure.
- Provide lunch and a soft drinks and coffee break for each day of the workshop.
- Provide a per diem (US$60 for each night spent in Saint Vincent and the Grenadines) to participants sufficient to cover all meals, laundry and transportation within Saint Vincent and the Grenadines not already provided. This cash per diem will be provided and signed for on the day of arrival or the next morning (depending on time of arrival on the island).
- Participants who are required to stay overnight in another country during transit to and from Saint Vincent will receive a per diem of US$200 for each night spent in a hotel. This cash per diem will be provided and signed for on the day of arrival or the next morning (depending on time of arrival on the island).

Upon receipt of all the documents in the list of requirements, Megapesca Lda will, for participants **from the Grenadines:**

- Provide and pay for a standard single occupancy hotel room for all the nights the participant is on the island of Saint Vincent on Workshop business.
- Reimburse the cost of travel from home base to the hotel where the Workshop is to be held, against an original receipt for travel costs (ferry, bus ticket, taxi receipt or similar).
- Provide lunch and a soft drink and coffee break for each day of the Workshop.
- Provide a per diem (US$60 for each night spent in Saint Vincent) to participants sufficient to cover all meals, laundry and transport within Saint Vincent not already provided. This cash per diem will be provided and signed for on the day of arrival or the next morning (depending on time of arrival on the island).

Upon receipt of all the documents in the list of requirements, Megapesca Lda will, for participants **from Saint Vincent:**

- Reimburse the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (bus ticket, taxi receipt or similar).
- Provide lunch and a soft drinks and coffee break for each day of the workshop.

Training on Fishery sector operations manuals and their application

Draft Covering letter

Dear….

10th EDF Sanitary and Phytosanitary (SPS) Project: Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

I am pleased to inform you that the **10th EDF Sanitary and Phytosanitary (SPS) Project,** implemented by the Inter-American Institute for Cooperation on Agriculture (IICA) has contracted Megapesca Lda of Portugal to implement the above contract. A major aim of the project is to prepare two manuals concerning laboratory testing for food safety parameters in fishery products, and six manuals concerning official controls for fishery products.

We understand from our project implementing partners (the Caribbean Regional Fisheries Mechanism) that you have been nominated to participate in the following activity, which will introduce relevant manuals to participants from the region:

Training course on "Fishery sector operations manuals and their application"
Monday, 5 December to Friday, 9 December 2016
Venue: Beachcomber Hotel, Saint Vincent and the Grenadines

We attach an information sheet which provides more details of the training course setting out the objectives, content and how you will benefit from the course, which will be delivered by recognised international experts. The project will provide economy flights, accommodation and a per diem for participants in the workshops.

I also attach the participant questionnaire and list of information requirements which we ask that you complete and send to this office (rowena@megapesca.com) by 30 September 2016. This will allow us to make the necessary logistical arrangements on your behalf.

We would also ask you to complete and submit the attached questionnaire regarding the technical organisation of your work. This will help us to focus the content of the manuals on precise regional needs. We expect to circulate the manuals for your review and comment in due course.

Many thanks for your cooperation and we look forward to meeting you in Saint Vincent.

Yours sincerely,

Megapesca Lda.

Title of course	**Fishery sector operations manuals and their application**	
Location	Beachcomber Hotel, Villa Beach, Saint Vincent and the Grenadines	
Date	Monday, 05 December to Friday, 09 September 2016	
Principal resource person	Dr. Ian Goulding	
Language of delivery	English	
Objectives	The objective of the course will be to: • Review inspection and official control methods and requirements for safety of fishery products, as set out in training manuals developed under the project • Demonstrate modern approaches to inspection, sampling and official control. • Develop an awareness of the role of laboratory testing in ensuring the safety of fishery products	
Participant profile	The course should be attended by staff of Competent Authorities responsible for the official control of the food safety of fishery products, in either a managerial or a senior inspection role. The course will assume that attending staff have a sound knowledge of food safety hazards associated with fishery products and of the HACCP system.	
Logistics	• The project will book and pay directly the following costs: Travel and subsistence for overseas participants, comprising: • Return economy Air ticket • Transport to and from the airport in St Vincent • Hotel Room, single occupancy • Visa costs (if any) reimbursed against an original receipt • Cash per diem (US$60 per night) to cover all meals (not included in Catering below) and incidentals Travel and subsistence for participants from the Grenadines comprising: • Reimbursal of the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (ferry, bus ticket, taxi receipt or similar). • Hotel Room, single occupancy • Cash per diem (US$60 per night) to cover all meals (not included in catering below) and incidentals Travel for participants from St Vincent comprising: • Reimbursal of the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (bus ticket, taxi receipt or similar). Catering for all participants on the training course (1 morning soft drinks and coffee break, plus lunch on each day of the training course	
Indicative programme / content	**AM**	**PM**
Monday, 05 December	Introduction to the inspection manuals Review of hazards in food safety products	Controls on Marine fisheries production; Controls on Aquaculture, feed and fry and freshwater fisheries production;
Tuesday, 06 December	Controls on Fish Processing;	Inspection of HACCP systems
Wednesday, 07 December	Traceability system;	Practical training and demonstration of inspection equipment
Thursday, 08 December	Inspection and official control;	Sampling and testing; role of

		laboratories
Friday, 09 December	Fishery product hazards in the Caribbean	Discussion session Evaluation Award of certificates

Participant questionnaire and information requirements

The nominated participant is requested to provide the following documents:

1. Completed Participant Information Form (see below)
2. Scan of passport details page (the page with photograph)
3. Scan of a letter or an email of "Permission to attend the workshop" from the relevant superior / manager; it should contain the participants name and dates of the workshop
4. E-mail confirming the participants' willingness and availability to attend the Workshop.

Participant Information:

1. Family Name:	
2. First names:	
3. Date of birth:	
4. Nationality:	
5. Home Address:	
6. Telephone Number:	
7. Mobile Number:	
8. Work Organisation	
9. Work Organisation Address:	
10. Passport Number:	
11. Passport Expiry Date:	
12. Name of the International Airport closest to your home town:	
13. Details of how you can travel to this International Airport:	

14. Do you have any special dietary requirements (please specify):	
15. Name / relation of person to contact in event of an emergency and contact detail: (Address, Tel / Email)	

Support to be provided

Upon receipt of all the documents in the list of requirements, Megapesca Lda will, for participants **from outside of Saint Vincent and the Grenadines:**

- Suggest flights to attend the workshop and upon agreement of the flights will provide an economy return ticket to the participant.
- Provide and pay for a standard single hotel room at the Beachcomber Hotel for the nights the participant is on the island of St Vincent on Workshop business.
- Provide transport for participants from and to the airport on the day of arrival and the date of departure.
- Provide lunch and a soft drinks and coffee break for each day of the workshop.
- Provide a per diem (US$60 for each night spent in Saint Vincent) to participants sufficient to cover all meals, laundry and transport within Saint Vincent not already provided. This cash per diem will be provided and signed for on the day of arrival or the next morning (depending on time of arrival on the island).
- Participants who are required to stay overnight in another country during transit to and from Saint Vincent will receive a per diem of US$200 for each night spent in a hotel. This cash per diem will be provided and signed for on the day of arrival or the next morning (depending on time of arrival on the island).

Upon receipt of all the documents in the list of requirements, Megapesca Lda will, for participants **from the Grenadines:**

- Provide and pay for a standard single occupancy hotel room for all the nights the participant is on the island of Saint Vincent on Workshop business.
- Reimburse the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (ferry, bus ticket, taxi receipt or similar).
- Provide lunch and a soft drinks and coffee break for each day of the workshop.
- Provide a per diem (US$60 for each night spent in Saint Vincent) to participants sufficient to cover all meals, laundry and transport within Saint Vincent not already provided. This cash per diem will be provided and signed for on the day of arrival or the next morning (depending on time of arrival on the island).

Upon receipt of all the documents in the list of requirements, Megapesca Lda will, for participants **from St Vincent:**

- Reimburse the cost of travel from home base to the hotel where the workshop is to be held, against an original receipt for travel costs (bus ticket, taxi receipt or similar).

- Provide lunch and a soft drinks and coffee break for each day of the workshop.

PLEASE NOTE THAT PARTICIPANTS IN THE COURSE "FISHERY SECTOR OPERATIONS MANUALS AND THEIR APPLICATION" WILL BE PRESENTED WITH A DONATION OF INSPECTION EQUIPMENT FROM THE PROJECT TO THEIR HOST ORGANISATION (WEIGHT <3KG and dimensions to be advised).

PLEASE BE INFORMED THAT (IF TRAVELLING BY AIR FROM OUTSIDE SAINT VINCENT AND THE GRENADINES):

- **SOME OF THESE GOODS WILL NEED TO BE CARRIED IN CHECKED BAGGAGE**
- **YOU SHOULD ALLOW FOR THIS WEIGHT IN YOUR RETURN JOURNEY WHEN PACKING FOR YOUR TRIP. NO EXTRA WEIGHT BAGGAGE CHARGES WILL BE REIMBURSED BY MEGAPESCA LDA.**

Appendix 3: Technical Questionnaire on National Sanitary Conditions for Completion by Course Participants

Name of National Competent Authority:		
Name of parent Ministry / organisation:		
Dimensions of the fishery sector operations which over which you apply sanitary controls.		
No. of aquaculture farms:		
No. small scale vessels (<1 day fishing trip):		
No. of semi-industrial vessels (fresh fish > 1 day fishing trip)		
• Line / Longliners		
• Trawlers		
• Seiners		
No. freezer / factory vessels:		
No. establishments (including cold stores)		
• Total		
• EU approved		
No. of export consignments/certificates issues in 2015		
• EU		
• Other markets		
Scope of responsibilities / activity in relation to food safety of fishery products (indicate all that apply)		
• Import control / certification	Yes	No
• Export control / certification	Yes	No
○ EU only	Yes	No
○ All destinations	Yes	No
• Domestic market controls	Yes	No
Laboratory resources available to CA:		
• Laboratory internal to the CA	Yes	No
• Use of external laboratory:	Yes	No
○ National	Yes	No
○ International	Yes	No
No. of food safety parameters tested:		

• Chemical	
• Microbiological	
No. of parameters tested within scope of accreditation	
• Chemical	
• Microbiological	
Staff resources of the Competent Authority	
No. of technical staff engaged in sanitary inspections	
No. with highest qualifications at:	
• Secondary level	
• Technical / vocation qualification	
• University level including post-graduate	
Dimensions of food safety activity of the Competent Authority	
No. of food safety inspections of performed in 2015:	
• Vessels	
• establishments	
• aquaculture	
Main food safety risks of concern (indicate no. of confirmed non-compliances detected in 2015)	

Appendix 4: References

STRENGTHENING FISHERY PRODUCTS HEALTH CONDITIONS IN ACP/OCT COUNTRIES

1. Guide to the Establishment of Environmental (EMP) and Residue (RMP) Monitoring Plans

2. Identification of regional priorities and development of TORS for future interventions for the Caribbean region (support to CA and testing labs)
   LTI032CAR
   June 2009

3. Guide to the Development and Maintenance of Fishery Product Testing Laboratories
   LTI040GEN
   October 2010

4. Equipment and Sustainability Mission - Belize
   LTI 090 BLZ
   August 2010

5. Study to Improve Compliance with EU Commission Sanitary Standards in the CARIFORUM Fisheries Sector" CARIBBEAN REGION
   Contract N° 36/03/06/CAR
   Final Report
   December 2006

6. Final Report of a Mission carried out in Belize from 10 October to 29 Of November 2003. Strengthening Fishery Products Health Conditions in ACP/OCT Countries. Advice and Support for Testing Laboratories
   Belize - Lot 2 Request for Services N° 16/07/03/BZE

7. Developing of aquaculture and other food safety legislation and review of inspection procedures in Guyana
   CA075GUY
   September 2010, Guyana

8. Updating of CA Inspection Manual and Training of Fishery Inspectors in St. Vincent and the Grenadines
   CA060VCT
   April 2010

9. St. Vincent and the Grenadines – Assistance to identify and establish laboratory services for the purpose of official control of fisheries products for export to EU
   LTI103VCT
   October 2010

10. Support for training of business operators in implementing and assessing risk based safety management systems
    IND080VCT
    August, 2010

11. Country situation up-dates
Antigua and Barbuda, October, 2010
Bahamas
Barbados
Belize

12. Manual / Handbook for the Execution of Sanitary Inspection of Fish as Raw Material and Fish-Products as Food for Human Consumption, May 2010

13. Report on the preparation of: A catalogue for basic test material for fish inspectors to be used in the daily work in the field
July 2007
AGC98 SRL

14. Guide to Promoting Organisational Integrity and managing, Corruption Risks for Fisheries Competent Authorities April 2009

DG SANCO Country Reports

15. DG (SANCO) / 8617 / 2002 – MR – Final Report of a mission carried out in the Bahamas from 8 to 14 August 2002 assessing the conditions of production of fishery products
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=837

16. Council Directive 91 / 493 / EEC
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31991L0493

17. DG (SANCO) / 2008 - 7654 - MR - Final Report of a mission carried out in Barbados from 17 November to 21 November 2008 in order to evaluate the control systems in place governing the production of fishery products intended for export to the European Union
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=2123

18. Final Report of an audit carried out in Suriname from 07 December 2015 to 17 December 2015 in order to evaluate the control systems in place governing the production of fishery products intended for export to the EU
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=3626

19. Report of a mission carried out in Grenada from 19 to 22 November 2002 for follow up and assessment of the conditions of production of fishery products intended to be exported to the European Union (Article 11 of Council Directive 91 / 493 / EEC)
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=882

Other references

20. GS1 Foundation for Fish, Seafood and Aquaculture Traceability Implementation Guideline provides guidance to the fish, seafood and aquaculture industry to implement GS1 standards. Release 1.0, Ratified, June 2015
http://www.gs1.org/docs/traceability/GS1_Foundation_for_Fish_Seafood_Aquaculture_Traceability_Guideline.pdf

21. Consultancy to Develop the CAHFSA Strategic Action Plan and Medium Term Work Programme- REF: CISP / CCS / 1.2.2 SER10.11 FINAL REPORT, Prepared for the CARICOM Secretariat, By UWI Consulting Revised 24 July 2011

22. 10th EDF SPS Project
Support to the Caribbean Forum of the ACP States in the Implementation of Commitments Undertaken Under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary Measures (SPS) Progress Report (Administrative, Technical and Financial Activities) (01 October 2014 – 30 July 2015)
Submitted by:
Inter-American Institute for Cooperation on Agriculture
31 July 2015

ANNEX 3: MID-TERM PROGRESS REPORT

PROGRESS REPORT

Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

Conch aquaculture production in the Caribbean
http://www.caicosconchfarm.net/

Contents

1. INTRODUCTION

This Report is submitted by Megapesca Lda of Portugal, a food and fisheries consultancy firm established in 1994. The report comprises an Interim Progress Report for the Project "Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade" implemented by the Inter-American Institute for Cooperation on Agriculture (IICA) under the EU funded project "10th EDF Sanitary and Phytosanitary Measures Project". The Caribbean Regional Fisheries Mechanism (CRFM), based in Saint Vincent and the Grenadines is nominated by IICA as responsible for the coordination of the technical implementation of the project.

The project commenced on signature of the contract on 26th August 2016, and is expected to finish in January 2017. This Report follows the submission of an Inception Report on the 8th October and subsequently approved by the CRFM and IICA.

The project is implemented by two key experts:

- Team Leader / Food Safety Specialist (Key Expert 1) for a total of 54 fee days
- Specialist in Food safety testing laboratory management and ISO17025 (Key Expert 2) for a total of 44 fee days

2. DESCRIPTION OF THE INTERVENTION

2.1 Objective

The objective of the project, according to the ToR is to:

To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

2.2 Project results

The project aims to:

- Develop at least 8 food safety operational manuals for field, laboratory, market and trade (import and export) to support the activities of designated persons and institutions responsible for the safety of fish and fish products
- Develop training programmes for improving official control and testing laboratory skills in SPS quality management of fish and fish products, (including the supply of relevant equipment)
- Deliver the training programmes in short courses in the region
- Design and implement Impact Assessment Tools
- Design relevant communication and visibility products

The expected result is that capacities will be built at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

3. ACTIVITIES UNDERTAKEN TO DATE

Since the commencement of the project the following activities have been carried out.

3.1 Preparation of training manuals

The consultants have drafted eight operations manuals, as follows:

1. Manual on Assuring Food Safety Conditions in Capture Fisheries,
2. Manual for the Inspection and Official Control of Caribbean Fishery Products
3. Manual on Assuring the Food Safety of Aquaculture Products
4. Guide to Food Safety Hazards in Caribbean Fishery Products
5. Manual on Assuring Food Safety Conditions in Fish Landing and Processing
6. Manual on Traceability Systems for Fish and Fishery Products
7. Manual on Laboratory Testing of Fisheries Products
8. Manual on Laboratory Quality Assurance

These have been circulated for comments to training course participants and CRFM Secretariat. Comments were received from eight stakeholders, including the CRFM Secretariat, and the manuals have been revised accordingly. These are now submitted as separate documents for the final approval of the IICA / CRFM.

Most of the comments received were valid and have resulted in amendments to the documents. A small number of the comments received were not addressed by the consultants, and where this is the case a justification has been provided (see *Appendix 1*).

Final checking and printing of the final materials will be undertaken after the delivery of the training courses.

3.2 Translation of the training manuals

The Consultants have identified specialists who will undertake the translation of the manuals into three languages: Spanish, French and Dutch. The translators are subject specialists who are native speakers in the relevant language. Translation of the draft manuals has commenced. Six manuals (1 to 6 above) are in the process of being translated.

Following the request of the consultants, the CRFM agreed that it would not be necessary to translate Manuals 7 and 8, since users of these manuals (laboratory analysts and quality control managers) would need English language skills in any case to be able to apply the reference documents (technical methodologies, ISO standards etc which are only available in that language).

3.3 Printing of the manuals

The consultants have identified a suitable publisher in Portugal, and on finalisation of the manuals will arrange for their printing, binding and delivery to CRFM. The following number of hard copies is to be provided (as set out in the ToR). This number does not include 15 draft copies of each which will be provided to participants in the training course.

English	100	French	20
Spanish	20	Dutch	20

The printed copies will be consigned to the CRFM Secretariat for onward distribution.

3.4 Organisation of training courses

3.4.1 Venue and dates

The training courses foreseen under the project will be delivered by the consultants at the Beachcomber Hotel, Saint Vincent and the Grenadines on the following dates:

Course title	Dates
Fishery Products Laboratory Testing	Monday, 28 November to Friday, 02 December 2016
Food Safety In The Fishery Sector	Monday, 05 December 2016 to Friday, 09 December 2016

3.4.2 Participants

The CRFM has written to the parent Ministries of all potential beneficiaries/participants. These include Competent Authorities responsible for official controls in the fishery sector and laboratories responsible for testing of food safety parameters of fishery products. With assistance from the consultants, 15 individuals have been selected to participate in each training course. A list of attendees for each course is shown in *Appendix 2*.

The consultants have been in contact with the participants. Information about the course was disseminated. Information required for travel arrangements (passport details, date of birth, address, nearest international airport etc) was requested from participants and obtained. Formal authorization has been granted in all cases (except for one) and the consultants have commenced making the specific travel arrangements and arranging for issue of tickets.

3.4.3 Course logistical arrangements

The detailed arrangements for the travel and subsistence, accommodation, catering, transfers, per diems for the training workshop are all in place, in line with the specifications set out in the inception report. The training room has been booked for the relevant dates.

Arrangements for the video recording of the training lectures and practical demonstrations have been made, along with stills photography for press releases, websites etc. This will be followed by the editing of the video (to include PowerPoint and audio presentations) in a format suitable for web-distribution

Certificates have been drafted and approved by CRFM.

3.4.4 Video recording

The training will be professionally video-taped to produce a high-quality edited set of video files (nominally 60 hours) for future use by the client. A sub-contract for this service has been established with Frost Studio, York, UK. Video cameras, audio system, have been purchased in the EU and consigned to the CRFM Secretariat, where they have been received in good order. The consultants will also bring in their luggage a projector for the presentations.

3.4.5 Technical content of the course

The consultants have prepared draft curricula for the training course, setting out the activities and titles and content for each training session, and the name of the principal resource person, and have submitted these for review by IICA and the CRFM.

This is shown in *Appendix 3* for the course on Fishery Products Laboratory Testing and *Appendix 4* for the course on Food Safety in The Fishery Sector. The trainers are now in the process of developing the course materials for each session using MS PowerPoint, which will refer to the draft manuals to be distributed to participants. Note that the courses will include practical demonstrations and exercises using the equipment supplied (see below).

3.5 Procurement of laboratory and other equipment for the training course

Equipment required to support the course activities was specified, suppliers were identified and the following equipment has been procured and shipped to St. Vincent and the Grenadines.

	Equipment	Suppliers
1	15 x Lovibond comparators (potable water testing)	OilWater Industrial - Serviços e Representações Rua dos Remolares 14, 3º - 1200-371 Lisboa Tel: +351 219 537 915 Fax:+351 213 469 078 www.oilwater.pt
2	1 x Histamine analysis (Rapid methods)	BIOLAN Laida Bidea Edificio 409 · Parque Tecnológico de Bizkaia 48170 Zamudio, Bizkaia SPAIN www.biolanmb.com
3	15 x Thermometers	AMBIFOOD Edifício Porto Magnum Rua Dominguez Alvarez, nº 44, 4.16 4150-801 PORTO www.ambifood.com
4	1 x Video and audio recording equipment	Proactive (UK) Ltd. Unit 1 Eastman Way Hemel Hempstead, Hertfordshire HP2 7DU UK Web: www.proav.co.uk

At the time of writing Items 2, 3 and 4 have been delivered and cleared from customs and are ready for use. Item 1 is in transit and will be delivered to St. Vincent and the Grenadines on the 15 November 2016.

Supplies of reagents and test kits containing temperature sensitive materials will be carried by the trainers from BIOLAN (supplier of rapid histamine test methods) and BIOPHARM (supplier of rapid microbiological test kits) in their luggage to ensure that they retain their activity and avoid the need for chilled storage on arrival. This includes the following items, for which the CRFM has issued letters to assist transport and entry into the St. Vincent.

	Items	Supplier
1	RIDA®STAMP Total Kit RIDA®STAMP Salmonella Kit Compact Dry TC (Total Count) Compact Dry SL (Salmonella) RIDASCREEN® Histamin (enzymatic) Premi®Test 25	R-Biopharm Latinoamérica V. de Obligado 2943 (1429) CABA 011-4701-6262
2	5 x Biotest Histamine (10 units) 1 x Calibration Kit Histamine 1 x Measurements Kit Histamine (2 units)	Biolan Microbiosensores, Parque Científico y Tecnológico de Bizkaia – Bizkaia, España

3.6 Development of impact assessment tools

The consultants have commenced the development of impact assessment tools, as required by the terms of reference. These will have three parts:

3.6.1 Training evaluation tool
Key performance indicators
Self-assessment survey of knowledge, attitude and practices

Results from (a) will indicate the immediate impacts of the course. Results from (b) and (c) will provide the baseline for longer term monitoring of the development of the sanitary control system for fishery and aquaculture products in the CARIFORUM region. Monitoring of these indicators in future and comparison with the baseline will provide a measure of the longer impact of the intervention project and subsequent actions.

3.6.2 Training evaluation tool
The first impact assessment tool will be a training evaluation tool, to allow an assessment of the relevance, effectiveness, level and quality of delivery of training activities undertaken by the project. This is proposed to be a questionnaire to be applied by the consultants at the end of each training course. A copy of the questionnaire to be used is shown in Annex 5.

3.6.3 Key Performance Indicators
The second part of the tool will present a series of Key Performance Indicators (KPIs) for the operation of a fishery and aquaculture sector sanitary control system. Some of the preliminary indicators are shown in the table below (based on publicly available data):

Key performance indicators	Value
% countries with EU access = 7/15	47%
No. of countries with CAs nominated for fishery products (=10/15)	67%
No. of countries authorised to supply the EU with:	
· fishery products = 7/15	47%
· aquaculture products = 3/15	20%
· Live Bivalve Molluscs etc (e.g. conch) = 1/15	7%
No. of approved processing establishments+ Cold stores	54
No. of approved freezer vessels + factory vessels	28
No. accredited laboratories	2
No. of food safety tests within accreditation scope	9
Fish Export Value (total include live fish) US$m	378.5
Fish Export Value (EU include live fish) = US$m	66.5
% of fish exports to EU market	18%
Fish imports Total US$	391.9
Region: balance of trade fishery products US$m	-15.4

Technical consultations via an email questionnaire were held with the course participants. The content (which was approved in the inception report) established information regarding key features of the official control systems and testing laboratories:

Competent Authorities
Profile of fishery sector (fleet, catches, processing establishments, aquaculture trade and employment)
Staff resources (number / qualifications / level / subject)
Qualifications of staff (level / subject)
Dimensions of activity (no. of inspections of vessels / establishments / aquaculture)
Main food safety risks of concern

Testing laboratories
Identification of laboratories
Test parameters offered and methods (official / rapid)
Accreditation and scope of accreditation
Laboratory staff resources (no / qualifications / level / subject)
The two questionnaires are shown in *Annex 6*. This was circulated to participants who will be attending the training courses. Eleven responses were received in relation to the Laboratory questionnaire and 10 from Competent Authorities.

The data will be analysed in detail during the next stage of the project, and will be used to determine the values of the additional Key Performance Indicators, in line with the project output of providing long-term impact assessment tools.

This exercise will provide several additional indicators. Examples could include:
Number of inspectors per 1,000 tonnes supply (production plus imports)
Proportion of countries / territories preparing annual control plans and reports
Number of vessels under sanitary control / total number of vessels
Number of processing establishments under sanitary control / total number of establishments
Number of inspections conducted / year
Number of non-compliances noted / Number of establishments
Number of certificates declined / number of certificates requested (for import and export)
Number of relevant tests conducted for official control / number of testing laboratories

3.6.4 Self-assessment survey of Competent Authority knowledge, attitude and practices

A further set of questions will be put to participants, to assess the views of the Competent Authorities regarding the status of the services which they supply, which will be used to identify changes in the knowledge, attitude and practices in relation to official control performance. These questions are based in part on the FAO / WHO Food Control Assessment Tool (November 2015 version) and on-line platform for information sharing on food safety control systems,[1] and a draft is shown in *Appendix 6*.

These elements will be completed by the participants in the Food Safety in the Fishery Sector training course, and the results will be tabulated to provide a baseline set of indicators.

[1] See FAO/WHO COORDINATING COMMITTEE FOR LATIN AMERICA AND THE CARIBBEAN, Twentieth Session, Viña del Mar, Chile, 21 - 25 November 2016, FOOD SAFETY AND QUALITY SITUATION IN THE COUNTRIES OF THE REGION, Trends in Food Safety and Quality issues in countries of the LAC region http://www.fao.org/fao-who-codexalimentarius/meetings-reports/detail/en/?meeting=CCLAC&session=20

3.7 Development of information/knowledge products

The consultants are required to prepare a range of knowledge products for use in CRFM communications. The specific products are set out in this section.

3.7.1 Development of a regional quarterly newsletter on fish sanitary controls

The first edition of a direct email newsletter has been prepared and is submitted in *Appendixx 7*. This includes articles of relevance to the Caribbean fishery sector which are drawn from *inter alia*:

Megapesca's FishFiles Lite (see http://www.megapesca.com/aboutfishfiles.asp)

Fish Inspector, a quarterly FAO publication (see: http://infofish.org/v2/index.php/the-fish-inspector)

IAFI newsletters (International Association of Fish Inspectors - see http://www.iafi.net/)

Codex Alimentarius Commission (http://www.fao.org/fao-who-codexalimentarius/en/)

Local newspapers (Trinidad Express http://www.trinidadexpress.com/)

The ECsafeSEAFOOD project food (http://www.ecsafeseafood.eu/)

CRFM Secretariat (http://www.crfm.int)

The consultants propose to develop one more newsletter along these lines during the remaining period of the project.

3.7.2 Preparation of press releases

The consultants have prepared one of **three** press releases presenting information regarding the consultancy and its activities, emphasising the importance of SPS measures in ensuring an economically sustainable fishery sector in the Caribbean region, and contribution of the 10th EDF Sanitary and Phytosanitary Measures (SPS) Project.

The first of these, addressing the launch of the consultancy and the future training action and the manuals is shown in *Appendix 8*. This was approved by the CRFM and posted on their website. Two more press releases will be delivered during the remaining period of the project (concerning the delivery of the training course and the final outputs of the project).

3.7.3 Preparation of an infographic

The consultants have prepared an infographic setting out relevant information and data regarding SPS issues addressing the fishery sector in the Caribbean region, as well as information regarding sanitary controls for fishery products and the laboratory testing of fishery products.

The infographic is in the form of an interactive map showing relevant SPS data for the Caribbean fishery sector, and is targeted at a level suitable for the public. The map is available at:
https://www.google.com/maps/d/viewer?mid=1CNNi7EAzDWCT3X71FKfoE-6PjEg&ll=15.374160806978065%2C-77.80062684433602&z=4

4. WORKPLAN, DELIVERY SCHEDULE AND NEXT STEPS

The delivery schedule proposed for the delivery of project inputs and outputs is shown below. Until now all activities by the consultants and stakeholders have been implemented in line with this schedule.

There are no barriers identified at this stage which might cause the implementation of the defined next steps to be delayed.

Key Date	Activity / Deadline
26 August 2016	Contract signature
15 September 2016	Inception Skype briefing meeting
19 September 2016	Submission of Inception report
	Commencement of drafting of manuals
23 September 2016	Deadline indicated in formal CRFM Secretariat communication requesting training participant list
	Commencement of logistical arrangements of participant travel
	Circulation of questionnaire to participants: data on controls / laboratories data required for logistical arrangements for training
03 October 2016	Receipt of comments/approval of Inception report (2 weeks after IR submission)
	Ordering of all equipment; shipment to Saint Vincent
07 October 2016	Sending of questionnaire to training participants
17 October 2016	Delivery of draft Food safety operations and Laboratory operations manuals to CRFM
	Distribution of manuals to participants for comment
	Submission of manuals for commencement of translation
	Preparation of Press Release 1 (Project activities)
07 November 2016	Deadline for submission of comments/questionnaires from participants
	Revisions and finalisation of manuals
	Preparation of Training curriculum and training materials for 2 training programmes
15 November 2016	Submission of Interim Report (to include draft training curricula, training manuals and training materials)
	Submission of Draft Regional Newsletter 1
24 November 2016	Travel of consultants / AV team to Saint Vincent
25 November 2016	Final preparations on site;
28 November 2016	Training course: Fishery products testing laboratory testing manuals and their applications
	Comments / Approval of Interim Report by CRFM
02 December 2016	End of training course; Course evaluation
05 December 2016	Training course: Fishery sector operations manuals and their application
09 December 2016	End of training course; Course evaluation
	Formal handover of donated equipment (training and testing)
	Preparation of Press Release 2 (Training outcomes)
10 December 2016	Departure of consultants from Saint Vincent
16 December 2016	Finalisation of manuals and printing
30 December 2016	Submission of draft final technical and financial report
	Packing and sending of manuals to CRFM
	Submission of draft report on training and equipment supplied
	Preparation of Press Release 3 (Project outputs)

Key Date	Activity / Deadline
	Submission of Draft Regional Newsletter 2
	Submission of infographic
	Submission of draft report on Impact Assessment Tool
13 January 2017	Submission of edited video files
	Submission of Financial Report
	Deadline for submission of comments on Draft final technical report and deliverables
31 January 2017	Submission of Final Technical Report, final financial report and all finalised deliverables

Appendix 1: Comments Received and Responses to Operations Manuals

Other than the following, all comments received have been addressed in the latest revisions of the manuals.

Comments from CRFM Secretariat

Manual / Comment	Reason
01 Capture fishing Do we want to say "should be equally applied" as opposed to "are equally applicable"?	No, the meanings are different. The material is equally applicable should the user choose.
01 Capture fishing I know it may be asking a bit much, but do these fish have "local" names by which they are referred in the Caribbean? Is it possible to include one or two of these names?	Not addressed, but we are happy to include some examples if you provide them.
01 Capture fishing A number of our countries still use imperial measures; do we want to parenthesise the corresponding values here and ff?	EU and ISO standards exclusively uses SI units. We consider it reasonable to expect users to have ability understand and use SI units.
01 Capture fishing Do we want to parenthesise oF equivalent here and ff?	Most fishery businesses are used to working in centigrade.
02 Inspection and control Listeria monocytogenes? common name	There is no common name for this bacterial pathogen
02 Inspection and control Do we want to format some kind of emphasis	The statement is as straightforward and to the point as we can make it
02 Inspection and control Organisation of the Competent Authority	In our experience, a common reason for dysfunctional controls is dysfunctional organisation structure, so it is a valid topic for inclusion here.
04 Hazards Agricultural pesticides did not seem to feature in this manual, and I think it is a problem for us here in the CARIFORUM region, as they may accumulate in the aquatic environment and animals.	It is correct that we have not identified pesticides as hazards to be addressed in this manual. We recognize that there are environmental issues concerning use of pesticides but there is no epidemiological data to indicate that they are a food safety issue. We have however extended the reference to monitoring of these compounds in the 02 Manual on Fish inspection and official control.
04 Hazards If there is a standard common name, it would be good to include.	There are no common names for microbiological hazards such as Vibrio or Listeria.
05 Processing Can't this be said in one simple sentence? Especially given the parametric value?	This is how it is set out in the regulation, and for consistency it is better to retain this standard approach.
05 Processing Is there anything from the Codex Fish Committee outputs that are noteworthy in this section and ff?	The whole manual reflects the Codex Alimentarius code of practice for fish processing.
05 Processing If possible could we include local (regional / Caribbean) names where available? Just to	We are happy to include some examples if you provide them.

"Caribbeanise" the documents and make it easier for the average reader?	
05 Fish processing Should this manual include in section 7 something about risk management that is linked to traceability? Risk was dealt with in another manual, but so was other stuff. Just wondering about the need for plants to have a risk management plan as part of their food safety control system, as described in section 7	The entire manual is about risk management and specific additional section is not required. However reference to risk management is now inserted in section 7, to define the role of the HACCP system as being to ensures that RM is effectively implemented.
07 Laboratory testing Please find below some areas where greater emphasis can be made: chemical tests required for potable water, marine and water treated by chlorine how to develop a sampling plan for the different samples (fish, water. etc.) procedures for internal audits and ways to validate methods some of the methods that can be used as alternatives to the ISO/EN standards Sampling methods for open bodies of water, fish and ice were not mentioned just those for tap water No mention was made of ways to preserve water for chemical testing only for microb Suggestions for the type of sample containers required to collect water for chemical and microb tests Requirements for pure water and a list of the substances in it that may inhibit growth under the conditions of the test	Chlorine is usually only tested using rapid methods, and this is addressed in 02 Manual on inspection and official control. Sampling plans are not appropriate in a laboratory testing manual; they are addressed in 02 Manual on inspection and official control and 03 Manual of Food safety of aquaculture products. Audits and Validation is addressed in 08 Manual on Laboratory Quality Assurance Correct. The order of preference is legally mandated, ISO, other standard, in house validated. Points 5 to 8: Sampling of water is important, but in these manuals there is a limit to the level of detail we can express. The documents are well referenced and the reader is expected to refer to the source materials mentioned. This should include the relevant ISO standards.
07 Laboratory testing - The use of rapid methods is welcomed to ascertain the quality of the fish/ water as quickly asap. However, in previous trainings it was made clear that the screening can be done the FBO but the designated lab of the competent authority should use the standard ISO methods. Are these rapids proposed sufficient to be used by the competent authority or for the FBO especially in the case where the result of the test indicates presence or absence only?	The manuals make it clear that designated labs can use rapid methods for screening, purposes but official methods must be used for official controls (i.e. if it is to be used as the basis for an official action which might result in a sanction, refusal of certification etc)
07 Laboratory testing Additionally, Copies of the various ISO methods should be made available for each country participating in the training through the project	Agreed. It is impossible to operate a laboratory without the relevant ISO methods being made available for the tests to be undertaken. The manual makes it clear that these should be provided, but it is for each laboratory to determine which are required and keep them up to date.
08 Laboratory Quality assurance This may be thought irrelevant, but do we advise somewhere that the laboratory should have a clear	It is relevant, however, this manual mainly provides information on technical, managerial aspects relevant for ensuring the quality and

vision and mission as well as guiding principles that places its work squarely in the context that we want; so as not to over-reach (or even "under-reach") itself in carrying out its role in the "big picture"	accuracy of test results. The vision, mission and policy by the top management of a laboratory is considered partially in chapter 12.4 on implementation of a management system for accreditation and its test scope and by costs of the laboratory operations. Ministries, CA authorities and designated laboratories have to understand the context of testing requirements for trade e.g. in which the manual 02 (Inspection and Control) provides more information.
Any idea for " flow-through" the lab, or is that not necessary	Principles to be considered for chemical and microbiological labs and the process of a sample workflow are explained by the Manual. A detailed floor plan of a fisheries laboratory, for both microbiological and chemical labs, is shown in the Guide to the development and maintenance of fishery product testing laboratories LTI040GEN, 2010 (reference in Annex 1).

Comments from Competent Authority, Suriname

Manual / Comment	Reason
01 Capture fishing Crew members should undergo a medical examination	Not required; only required for factory vessels.
01 Capture fishing Before handling fish with water or for the manufacturing of ice, water used by fishing vessels must be treated by chlorination (with a suitable contact period), or with UV light (with adequate/ effective working capacity).	It is not necessary if clean seawater is used for the permitted purposes. It is only where there is a requirement for potable water that it should be so treated.

Comments from Environmental Health Department, Saint Lucia

Manual / Comment	Reason
05 Processing Due to inconsistence / or impact climatic events on water supply processing facilities should be recommended to have at least a 3 day auxiliary portable water supply.	The requirement is for a supply at all times – the amount of reserve is a matter for the operator to be ensure that this requirement is met.
05 Processing Clean sea water should be qualified / parameters should be set for testing coastal waters and determining quality of sea water that can be used for production in fisheries, and perhaps mapping other areas where sea water cannot be drawn including harbors.	Unfortunately there are no accepted standards for clean seawater; the manual already states that harbour water should not be used.
05 Processing Whereas 01 CRFM states only portable water should be used to wash fish which has undergone filleting, slicing skinning, mincing etc. manual 05 is indicating sea water can be used for processing.	This is consistent; use of seawater is permitted for washing of unprocessed fish. Manual 05 maintains the requirement.

Comments from Veterinary Department, Jamaica

Manual / Comment	Reason
Also, could a short section be included in one of the manuals on how to write a HAACP plan?	This is addressed already in the existing CRFM Guidelines on Developing and Implementing HACCP Plans for Fish and Fishery Products, September 2015 (which is cross referenced)

Comments from Fisheries Division, Saint Vincent and the Grenadines

Manual / Comment	Reason
07 Laboratory testing This manual is very detailed and useful to our laboratory as some of the test methods stated are within the scope of our testing. However, under section 4: Chemical Parameters, no parameters for water testing was stated or highlighted. For our laboratory's scope of testing parameters such as pH, conductivity, free & total chlorine, ammonia, chloride and turbidity are required, therefore, we would like these parameters to be detailed or highlighted within the manual.	There is information in the manual on page 2 that test methods for the analysis of simpler chemical techniques for determination of physical-chemical parameters of processing water (e.g. pH, turbidity, etc.) are considered to be outside the scope of the manual.

Comments from Food Safety & Technology Laboratory, Bahamas

Manual / Comment	Reason
07 Laboratory testing With respect to the sulphite test we include a quality control/recovery step. I usually use the HMS. Attached an extract from our manual.	Thank you! The quality control step can be discussed during the training.

Appendix 2: List of Participants Selected for Training Courses

Fishery Products Laboratory Testing: 28 November to 02 December 2016

Name	Coming from	Job title
Laël Bertide-Josiah	Antigua and Barbuda	Scientific Officer, Department of Analytical Services
Avis Gweneth O'Reilly-Richardson	The Bahamas	Senior Chemist Food Safety and Technology Laboratory
Crystal Merritt	Barbados	Laboratory Analyst
Jessica Hyde	Belize	Laboratory Technician, Food Safety Department
Jaceline Millar	Commonwealth of Dominica	Laboratory Technologist, Water Quality Laboratory, Environmental Health Department, Ministry of Health
Miriam Ortega	Dominican Republic	Laboratory Analyst, veterinary Central Laboratory, Ministry of Agriculture
Erwin Henry	Grenada	
Nakita Anita Dookie	Guyana	Fisheries Officer, Ministry of Agriculture Fisheries Department
Kerriel Thandile Green	Jamaica	Veterinary Services Division, Veterinary Services Diagnostic Laboratory
Jermine Mike	Saint Kitts and Nevis	Chemist / Standards Development Officer, St. Kitts and Nevis Bureau of Standards
Rosanna P. Sonson	Saint Lucia	Laboratory Manager, Gros Islet Polyclinc Food and Water Laboratory
Cylena Andrews	St. Vincent and the Grenadines	Fisheries Officer – Quality Assurance
Alisa Martin	St. Vincent and the Grenadines	Fisheries Officer, Mircobiologist / Testing Laboratory Quality Manager
Soenita Kariem-Janki	Suriname	Head of the Laboratory Fish Inspection Institute
Joanna Malsingh	Trinidad and Tobago	Chemist, Chemistry Food and Drugs Division, Ministry of Health

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Name	Country	Job title / Organisation
Ian S. Horsford	Antigua and Barbuda	Senior Fisheries Officer National Focal Point (WECAFC),Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs
Katrina Woodside	The Bahamas	Assistant Fisheries Officer, Department of Marine Resources
Sherlock King	Barbados	Manager of Markets
Nestor Orlando Correa	Belize	Belize Agricultural Health Authority Food Safety Inspector
Jullan Defoe	Commonwealth of Dominica	Fisheries Officer, Ministry of Agriculture and Fisheries
Moran Mitchell	Grenada	Fisheries Officer II
Ozaye Warren Stephon Dodson	Guyana	Veterinary Public Health Officer
Gavin Peters	Guyana	Animal Health Specialist, CAFHSA

Miskha Stennet	Jamaica	Senior Veterinary Officer. In charge of the Aquaculture and Marine division of the Food Safety Unit.
Nikkita Browne	Saint Kitts	Oceanography and GIS Officer Inspect the quality of fishery products for export.
Ernie Wayne Pierre	Saint Lucia	Senior Environmental Health Officer, Ministry of Health Human Services, Family Affairs and Gender Relations
Marjory Soetini Kromotaroeno	Suriname	Senior Inspector of the Inspection department Fish Inspection Institute
Arisha Sewbaran / Sital	Suriname	Sub-Head of the Inspection Department, Fish Inspection Institute
Guenette King	Saint Vincent and the Grenadines	Fisheries Assistant - Quality Assurance
Stella Harrygin	Trinidad and Tobago	Food and Drugs Inspector

Appendix 3: Draft Curriculum: fishery Products Laboratory Testing

Principal resource person	Dr. Christine Froese
Objectives	The objective of the course will be to: Review testing methods and requirements for key fish safety parameters, as set out in training manuals developed under the project Demonstrate modern rapid methods of analysis (chemical and microbiological) Develop an awareness of laboratory quality management procedures and accreditation requirements (ISO17025) Introduce Operational manuals prepared on behalf of IICA and CRFM: Manual on Laboratory Testing of Fisheries Products Manual for Laboratory Quality Assurance

PROGRAMME

Monday, 28 November 2016
Principal Trainer: Christine Froese, Megapesca Lda.

Time	Course Content	Comment
09.00-10.45	Welcome; official opening by IICA, SVG Ministry and CRFM Vote of thanks Introduction to the project Logistical and administrative arrangements Group photograph	
10.45-11.00	Coffee break	
11.00-12.00	Introduction of the training course, objectives, structure etc. Introduction of participants and trainers	Background to the course, aims and objectives Presentation of participants and summary of their current activities
12.00-13.00	Introduction to the two manuals and how to use the manual	This session will present the aims, objectives and content of each manual prepared by the project: Manual on Laboratory Testing of Fisheries Products Manual for Laboratory Quality Assurance It will set out how these documents can be used by designated laboratories for testing for official controls. The session will emphasise the importance of using standard approaches to sampling and test methods, and show how laboratory best practices for accuracy of test results for international trade. It will describe the EU approach to the management of official control laboratories
13.00-14.00	Lunch	
14.00-15.30	Microbiological water testing	The session will address standard methods for testing water and ice safety and quality based on the requirements of the EU drinking water directive and by use of ISO standards. It also covers trends in water quality testing for human consumption and

		alternative methods. Specific methods will be described for testing for E. coli and coliform bacteria by use of chromogenic media and enumeration of culturable microorganisms, colony count at 22°C and 36°C and for testing for Clostridium perfringens. It will cover techniques of membrane filtration and enumeration including quality assurance and validation. It especially aims at introduction new ISO standards and tests by use of chromogenic media.
15.30-15.45	Health break	
15.45-17.00	Microbiological testing for fish, fishery products, sea shellfish and molluscs	The session will cover EU standard methods for microbiological testing for fish, fishery products, shellfish and molluscs covering typical hazards in the Caribbean region. It will cover the definition of microbiological criteria. The session will address sampling, sample preparation, procedure, technique/media, result expression, quality assurance and validation, and provide an overview on possible alternative methods. The session will describe examples of colony count at 30°C and for detection of salmonella in cooked crustaceans and molluscs shellfish and live bivalve molluscs, live echinoderms, tunicates and gastropods.

Tuesday, 29 November 2016
Trainers Christine Froese, Megapesca & Iñigo Hernandez, Biolan

Time	Course Content	Comment
9.30-10.00	Practical work: demonstration and experience of BIOFISH 300 (BIOLAN) histamine determination	This session will describe and demonstrate a fast, easy and reliable test for quantification of histamine in fish by an enzymatic biosensor (BIOFISH 300). The method can be used for determination of histamines in raw, canned, cooked and salted fish and in fish meal. The session will cover: 1. Explanation of the method's basis. 2. Calibration of the device
10.00-10.30	Coffee break	
10.30 -13.00	Practical work: demonstration and group work of BIOFISH 300 (BIOLAN) histamine determination	Continuation of session on histamine analysis (using the example of canned fish). It will allow the participants to obtain hands-on experience of: 1. Sample preparation 2. Extraction and Measuring of the sample. The session will concluded with a discussion on the context for application of rapid histamine testing.
13.00-14.00	Lunch	
14.00-15.30	Histamine analysis in fish	The session will describe the EU official test method for histamine determination in certain fish species including sampling and sample preparation,

		reporting of results and validation.
15.30-15.45	Health break	
15.45-17.00	Chemical and toxin testing in fish and fishery products	The session will review the analytical methods for determination of some of the major chemical hazards - heavy metals (cadmium, lead and mercury), sulphur, marine biotoxins – which should be subject to control and testing in fish and fishery products from the Caribbean region with relevance for trade to EU. The session will cover the equipment required, sampling, sample preparation, and testing methods to be applied, as well as performance criteria, expression of results and quality assurance.

Wednesday, 30 November 2016
Trainers: Christine Froese, Megapesca & Cristina D´Aiutolo, BIOPHARM

Time	Course Content	Comment
9.00-10.30	Demonstration and group work of rapid test kits related to microbiological determination.	The session will introduce and demonstrate a range of rapid test methods, using the BIOPHARM test kits of rapid microbiology tests. Participants will experience their application to surfaces, water and fish using: Rapid Swabbing methods using – RIDASTAMP TOTAL, RIDASTAMP SALMONELLA Rapid detection of Pathogens – COMPACT DRY SALMONELLA
10.30-10.45	Coffee break	
10.45-13.00	Continuation of demonstration and group work on rapid microbiological test kits	The session will introduce and demonstrate a rapid test method for detection of bacteria in water. Participants will be trained in the use of the BIOPHARM COMPACT DRY TOTAL test kits.
13.00-14.00	Lunch	
14.00-15.45	Use of competitive enzyme immunoassay tests for the screening of samples for histamine	The session will introduce and demonstrate an alternative rapid test method for detection of histamine in fishery products. Participants will be trained in the detection of Histamine in fish –using the BIOPHARM RIDASCREEN HISTAMIN (enzymatic) test kit
15.30-15.45	Health break	
15.45-17.00	Continuation of histamine screening tests	Practical groupwork on detection of Histamine in fish – RIDASCREEN HISTAMIN (enzymatic)

Thursday, 01 December 2016
Trainers: Christine Froese, Megapesca & Cristina D´Aiutolo, Biopharm

Time	Course Content	Comment
9.00-10.30	Use of rapid test kits for detection of antibiotics in fish and shrimps	The session will introduce and demonstrate a rapid test method for detection of antibiotics in fish and shrimps – BIOPHARM PREMITEST
10.30.10.45	Coffee break	
10.45-13.00	Continuation of use of rapid test kits for detection of antibiotics in	Practical Groupwork Detection of antibiotics in fish and shrimps – BIOPHARM PREMITEST

	fish and shrimps	
13.00-14.00	Lunch	
14.00-15.30	Quality assurance in fish testing laboratories Part 1	The session will introduce the topic of laboratory quality assurance, considering the accuracy of test results in microbiological and chemical testing in fish and fishery products. It will outline the scope and the requirements set out in ISO / IEC 17025, with regard to accommodation and environmental conditions, facilities, personnel, equipment and maintenance, reagents and culture media, sampling and management requirements and other factors relevant for the competence of testing and accuracy of results.
15.30-15.45	Health break	
15.30-17.00	Quality assurance in fish testing laboratories Part 2	Continuation of the previous session. The session will consider detailed requirements for ensuring the accuracy of test results in fisheries labs, addressing test methods and validation, performance verification, reference materials, reporting of results and quality assurance.
19.00-22.00	Course dinner	

Friday, 02 December 2016
Trainers Christine Froese and Ian Goulding Megapesca

Time	Course Content	Comment
9.00-10.30	Business planning for laboratories	Introduction to business planning for laboratories addressing the costing of testing services, pricing, profit and loss, breakeven, SWOT analysis and preparing a business plan
10.30-10.45	Coffee break	
11.00 -13:00	Quality assurance in fishery laboratories Part 3 - accreditation	The session will address the specific requirements and steps towards accreditation of laboratories in line with ISO 17025 and requirements
13.00-14.00	Lunch	
14.00-15.30	Needs assessment of fisheries laboratories in the Caribbean region	This session will be an open discussion session on strategic development of laboratory testing services for food safety in the fishery sector, with special reference to the role of national and regional laboratories.
15.30-16.00	Health break	
16.00-16.30	Evaluation of the course	
16.30-17.00	Award of certificates and closing ceremony	

Appendix 4: Draft Curriculum: Food Safety in the Fishery Sector

Principal resource person	**Ian Goulding, Megapesca Lda.**
Objectives	The objective of the course will be to: Review inspection and official control methods and requirements for safety of fishery and aquaculture products, as set out in new operational manuals for sanitary controls developed by CRFM Present and demonstrate modern approaches to inspection, sampling and official control of fishery and aquaculture products. Develop an awareness of the role of laboratory testing in ensuring the safety of fishery products

PROGRAMME

Monday, 05 December 2016

Time	**Title**	**Contents / Reference**
09.00-09.45	Welcome and official opening Introduction to the project Logistical and administrative arrangements Formal presentation of equipment to participants Group photograph	Caribbean Regional Fisheries Mechanism Consultants
09.45-10.45	Introduction to the training course, objectives, structure Introduction of participants and trainers Introduction to and overview of the manuals prepared by the project	Background to the course, aims and objectives Presentation of participants and summary of their current activities Presentation of the aims and content of each manual, and set out how they can be used by fishery business operators and competent authorities: Manual on Assuring Food Safety Conditions in Capture Fisheries, Manual for the Inspection and Official Control of Caribbean Fishery Products Manual on Assuring the Food Safety of Aquaculture Products Guide to Food Safety Hazards in Caribbean Fishery Products Manual on Assuring Food Safety Conditions in Fish Landing and Processing Manual on Traceability Systems for Fish and Fishery Products
10.45-11.00	Coffee break	
11.00 -13.00	1. Food safety, international trade and the fishery sector	The session will provide the international context for the development of sanitary controls in the fishery sector. It will address the role of the SPS Agreement and Codex

		Alimentarius Commission, and introduce participants the concepts of risk management and official control in the context of international standards.
13.00-14.00	Lunch	
14.00-15.30	2. Case study on the Codex standard for smoked fish	This case study will be a group exercise to identify the issues which should be taken into account in the setting of an international standard for the safety of a processed fishery product.
15.30-15.45	Health break	
15.45-17.00	3. Classification of hazards: review of chemical, biological and physical hazards	This session will address the scientific basis for the main food safety hazards encountered in fishery products within the region along with methods of elimination and control. It will characterise the most important chemical physical and microbiological hazards. Key hazards covered will be histamine, ciguatera, heavy metals, *Cl.botulinum* and other food poisoning bacteria. Reference: *Food Safety Hazards in fishery products (Manual No.4)*

Tuesday, 06 December 2016

Time	Title	Contents / Reference
9.00-10.00	4. Food safety conditions in fishing operations	This session will address the design structure and operation of fishing vessels in terms of ensuring the food safety of the catch. It will relate food safety conditions to the different species targeted and the fishing gears used, as well as dealing with the post-harvest handling conditions onboard to ensure that product safety and quality is maintained. There will be a special focus on the need to chill histamine producing species. *Assuring Food Safety Conditions in Capture Fisheries (Manual No.1)*
10.00-10.30	Coffee break	
10.30 -13.00	5. Food safety conditions in landing and processing	This will address the design structure and operation of fish landing and processing operations, in terms of ensuring the food safety. It will deal with ensuring hygienic conditions, including personal hygiene and standard operating procedures such as pest control, cleaning and sanitising. The context for HACCP and traceability systems is also described, although these are dealt with elsewhere. *Assuring Food Safety Conditions in Fish Landing and Processing (Manual No.5)*
13.00-14.00	Lunch	
14.00-15.30	6. Safety of water	This will address water safety, with special reference to treatments to ensure

		microbiological safety. It will address the chemistry of chlorination, for potabilization and sanitising, as well as approaches to sampling and treatment of water. It will also review cleaning and sanitising methods. *Assuring Food Safety Conditions in Fish Landing and Processing (Manual No.5)*
15.30-15.45	Health break	
15.45-17.00	7. Practical session: water safety and pH/Cl testing	This is a practical session in which participants will undertake the analysis of free and combined chlorine and pH in potable water using the Lovibond test kits. *Assuring Food Safety Conditions in Fish Landing and Processing (Manual No.5)*

Wednesday, 07 December 2016

Time	Title	Contents/Reference
9.00-10.30	8. Implementation of HACCP systems	This session will review the HACCP system, as a means of ensuring that food safety hazards are under control. It will present the 7 principles of HACCP, using examples from the fishery sector (specifically in relation to the histamine and ciguatera hazards). CRFM Guidelines on Developing and Implementing HACCP Plans for Fish and Fishery Products, September 2015
10.30-10.45	Coffee break	
10.45-13.00	9. Official controls 1.	This session will address organisation and management of Competent Authority functions, and address issues such as organisation structure, and ensuring the integrity of the control system. *Manual No.2: Inspection and Official Control*
13.00-14.00	Lunch	
14.00-15.45	10. Official controls 2	This session will consider, the role of the inspector, the role of checklists and scoring systems, the importance of setting out non-compliance procedures, certification and annual control plans and reports. *Manual No.2: Inspection and Official Control*
15.30-15.45	Lunch	
15.45-17.00	11. Risk based inspections	This session will look in detail at the approach to applying principles of risk management in the design and implementation of an inspection systems. It will consider risk profiling of establishments based on severity and frequency of hazards, assessing compliance history and use of risk profile data in allocation of control resources. *Manual No.2: Inspection and Official Control*

Thursday, 08 December 2016

Time	Title	Contents / Reference
9.00-10.30	12. Design and implementation of food safety monitoring; programmes	This session will consider the role of monitoring in assessing effectiveness of the control system. It will address the selection of monitoring parameters, sampling strategies and selection of testing methods (including screening). *Manual No.2: Inspection and Official Control*
10.30.10.45	Coffee break	
10.45-13.00	13. Financial management of official control functions	Financial management of the inspection system, the role and management of laboratory testing. Business planning for laboratory investments and the make or but decision. This will include a group exercise on laboratory financing *Manual No.2: Inspection and Official Control.*
13.00-14.00	Lunch	
14.00-15.30	14. Food safety hazards in aquaculture; veterinary medicines, aflatoxins	This session will consider the special food safety issues to be addressed in aquaculture, with particular reference to species produced within the region (shrimp and tilapia). Specific hazards (aflatoxins and veterinary medicines) will be described and control methods. *Manual No.3 Food safety hazards and controls in aquaculture*
15.30-15.45	Health break	
15.30-17.00	15. Food safety controls in aquaculture; monitoring requirements and inspection of aquaculture facilities	The need for residue monitoring programmes will be discussed, along with the design of sampling and testing protocols. Specific requirements for inspection and control of aquaculture establishments will be covered, and implications for HACCP plans and traceability. *Manual No.3 Food safety hazards and controls in aquaculture*
19.00-22.00	Course dinner	

Friday, 09 December 2016

Time	Title	Contents / Reference
9.00-10.30	16. Traceability systems for fishery and aquaculture products 1	Reasons for traceability (food safety, tariffs and IUU fishing requirements). Regulatory basis and voluntary certification; key features of traceability systems; internal and external traceability; batch separation and data recording. *Manual No.6: Traceability Systems for Fish and Fishery Products*
10.30-10.45	Coffee break	
11.00 -13:00	17. Traceability systems for fishery and aquaculture products 1	Implementation of product withdrawal and recall; inspection of traceability; international coding systems, crisis management; traceability tools and data logging systems

		(example of Timestrip system). *Manual No.6: Traceability Systems for Fish and Fishery Products*
13.00-14.00	Lunch	
14.00-15.30	18. How to regionalise functions related to inspection and control of fishery products: Open session: discussion on implementation of strengthened sanitary controls in the Caribbean fishery sector	The session will present case study on the design of the Pacific Regional Competent Authority Support Unit (RECAS). It will provide an opportunity for participants to discuss the ways to implement what they have learnt during the course and, in particular, to consider the potential for greater regional integration of control activities in the fishery sector.
15.30-16.00	Health break	
16.00-16.30	Evaluation of the course Completion of baseline questionnaire	
16.30-17.00	Presentation of equipment Award of certificates Closing ceremony	Caribbean Regional Fisheries Mechanism

Appendix 5: Training Course Evaluation Tool

Please answer the following questions by circling your score (choice) between 1 - 5 or write your comments in the allocated space. Please note that your answers will be treated confidentially.

1. Overall, how did you find the content of training workshop?

(a) no new ideas 1 2 3 4 5 lots of new ideas

(b) too theoretical 1 2 3 4 5 very practical

2. In respect of your professional work this training workshop was:

of no use 1 2 3 4 5 very useful

3. How much better will you be able to do your job as a result of this training workshop?

very little change 1 2 3 4 5 very much better

4. How did you find the pace of the training workshop?

too slow / quick 1 2 3 4 5 good pace

5. Overall, how did you find the quality of the resource person(s)

poor 1 2 3 4 5 excellent

6. How did you find the logistical arrangements (travel, accommodation, catering etc.)

poor 1 2 3 4 5 excellent

7. How did you find communication and sharing of information prior to the training course delivery?

poor 1 2 3 4 5 excellent

8. Please explain how this training will help you to improve your performance in your job, with examples

9. Please indicate how such courses as this could be improved in future

(*p**lease continue overleaf if required)***

Questionnaire: Technical Questionnaire Official Control of Fishery Products in the Caribbean Region

Country:		
Name of National Competent Authority:		
Name of parent Ministry/organisation:		
Dimensions of the fishery sector operations which over which you apply sanitary controls.		
No. of aquaculture farms:		
No. small scale vessels (day fishing):		
No. of semi-industrial vessels (fresh fish)		
Line / Longliners		
Trawlers		
Seiners		
No. freezer / factory vessels:		
No. establishments (including cold stores)		
Total		
EU approved		
No. of export consignments in 2015		
EU		
Other markets		
Scope of responsibilities/activity in relation to food safety of fishery products (indicate all that apply)		
Import control /certification	Yes	No
Export control / certification	Yes	No
EU only	Yes	No
All destinations	Yes	No
Domestic market controls	Yes	No
Laboratory resources available to CA:		
Laboratory internal to the CA	Yes	No
Use of external laboratory:	Yes	No
National	Yes	No
International	Yes	No
Food safety parameters tested (please list)		

Chemical	
Microbiological	
Parameters within scope of ISO17025 accreditation (please list)	
Chemical	
Microbiological	
Staff resources of the Competent Authority	
No. of technical staff engaged in sanitary inspections	
No. with highest qualifications at:	
Secondary level	
Technical / vocation qualification	
University level	
Dimensions of food safety activity of the Competent Authority	
No. of food safety inspections of performed in 2015:	
Vessels	
establishments	
aquaculture	
Main food safety risks of concern (indicate no. of confirmed non-compliances detected in 2015)	

Questionnaire: Technical questionnaire Testing Laboratories

1.1 Identification and location of your organisation / laboratory

Name of the laboratory	
Address / Country Phone / Email	
Type of laboratory	Public ( ), private ( ), academia ( ), research ( ), other ( ) If other specify:
Officially designated by the Competent Authority	Yes ( ) No ( ) If yes, for what tests and products (please specify)
Name of Competent authority / parent organisation / ministry	

1.2 Working areas, put an X in the box to indicate which analytical service you offer

Organoleptic, sensory		Food safety - residues and contaminants	
Food microbiology, bacteriology		Toxins	
Pathogen testing		Veterinary testing	
Food quality, chemistry		Environmental testing (air, soil)	
GMO, Biotechnology		Water chemistry	
Water microbiology		Feed analysis	
Veterinary drugs residues analysis		Others, please specify if	
Pesticides residue analysis			

1.3 Activity in relation to food safety of fishery products – put an X in the box for those that apply to your service

Import control		Routine surveillance	
Export control national		Technical support to industry	
Export control EU		Certification	
Monitoring programmes		Other, specify if	

1.4 Use of external laboratories, is your laboratory subcontracting tests?

No ( ) Yes ( )

If yes, please specify in the table below

	Location of laboratory	What tests	Why
National			
International			
Others			

1.5 Main products tested (on what)

1.6 Tests conducted for export to the European Union, others

	Parameter / matrix	**Reference**	
1.	Histamine in fish		
2.	Salmonella in water	ISO	
3.			

1.7 Turnaround time of test results _____ (days)

1.8 Provision of opinion yes ( ) No ( )

1.9 Is the laboratory involved in sample taking? Yes ( ) No ( )

If yes, is in what area put an X in the box

Water		Others, specify
Food		

1.10 Major sources of funding for the laboratory (e.g. state budget, donor support)

Capital investment (e.g. equipment, buildings)

Operating expenses (e.g. purchase of reagents, salaries)

2. Human resources

2.1 Staff employed by your laboratory

Qualification	Number of persons	Department*	% of time working in the laboratory
University graduates PhD MSc BSc Appl.			
High school, 3 years' experience			
High school, < 3 years' experience			
Technician			
Admin personnel (non-technical)			
Service, cleaners; maintenance etc.			
Total personnel			

*C = Chemistry, M= Microbiology, T = Toxins

Average staff experience in years

2.2 Staff training

The laboratory has

Activity	Yes	No
Training programme for regular training		
Training programme for new personnel		
Budget allocation for training		
System to evaluate training programme		
System to evaluate personnel performance		
System to record staff training		

3. Housing and system infrastructure

3.1 Premises construction

Built (year) _____

Floor plan area _____ (sqm) and number of rooms ____

Conditions
Good ( ) Average ( ) Poor ( )

3.2 Indicate areas available

Description	Present Yes or No	Number	sqm	Condition		
				good	average	poor
Offices and admin areas						
Electronic data processing, LIMS						
Chemical department						
Microbiology						
Toxin laboratory						
Sample reception						
Areas for						
Media preparation						
Sterilisation						
Incubation						
Quarantine						
Sample preparation						
Weighting						
Instrumentation						
Sample storage						
Instrument rooms						
Storage for chemicals, solvents						
General storage area						
Maintenance workshop						
Gas room						
Lecture, training room						
Library						
Lunch room						
Dressing room						
Others, list						

4. Instruments and equipment

4.1 List the main instruments and equipment available, their operation status, date of purchase

Type of equipment (brand) and functions	Operational status		Purchase date/brand	Analysis mainly for	Calibration
	In use	out of service			
Atomic Absorption Spectrometer					
Autoclave (clean)					
Autoclave (dirty)					
Biosafety Cabinet class II					
ELISA equipment (Washer / Incubator / Reader)					
Dry ice machine					
Freezer -20°C					
Balance					
Gas Chromatography with FIF ECD NPD FPD detection system etc.					
…..					

If available submit list of equipment

4.2 Maintenance of equipment?

Yes ( ) No ( )
If yes, do you have maintenance contracts and for which equipment?

List of routine analysis, test performed by the laboratory

Enter all relevant tests performed in the laboratory (one test/line) and provide requested details for each test

Type of testing undertaken

Pathogen Contaminant Parameter	Sampling method	Sample matrix	Purpose 2, 3, 4 Category	Equipment used	Testing method 5 Reference source, year, number	Status of method 6 SOP available? Y / N	Estimated sample per year

Indicate which methods are used (AOAC, ISO, OIE, Codex, in-house / self-developed, nat. standards, others?)

How were the methods selected?

Are the methods validated?

SOPS for methods?

Standards and reference chemicals for these methods available and are they certified and stored appropriately

[2] Codes for purpose: A = Enforcement nat. regulations; B= Application of international standard; C = commercial requirement (import/export control; D Trade; E = Adulteration of products; F = technical support to industry; G = food safety; H = research; I = investigation of outbreaks; J = Others

[3] Category: X= Verification programme; Y = monitoring programme; Z = surveillance programme

[4] N = Quantitative; L = Qualitative

[5] ISO; AOAC; OECD; OIE; Codex; Scientific literature; in-house, nat. standard, others

[6] A = accredited; B= validated; C = certified; D= none

According to the type of analysis indicate the number performed over the last 3 years

Group of analyses	2013	2014	2015
Food Microbiology			
Water microbiology			
Food quality			
Histamines			
Feed			
Pesticide residues			
Heavy metals Water Fish			
Veterinary Drugs			
Contaminants			
Sulfites			
Toxins (fish)			

Auxiliary service

Do the following supplies meet your laboratories needs?

Supply	Yes	No	Comment
Gas			
Vacuum			
Air			
Electrical			
Water			
Purified water system			
UPS			
Stabilizers			
Supplies			

Quality assurance programme, accreditation
Has the laboratory implemented a quality management system?

	Yes	No	
ISO 17025			
ISO 9001			
Other			

Indicate which of the following elements of a quality management programmes exist at the laboratory and in which analysis and group of analyses

Elements of QA/QC programme	Exist	Comment
Quality Manager		
Quality assurance Unit		
Quality Manual		
Review schedule for manual		

Environmental controls		
System for laboratory waste disposal		
Calibration of equipment		
Preventive maintenance programme for instruments		
Control charts		
Documented standardized procedures and methods		
Internal control of laboratory procedures (blind spiked samples e.g.)		
Use of standards and reference material		
Test report forms		
Procedure of authorized staff to use and sign the results of analysis		

Does the laboratory participate in national, international proficiency testing (PT) programmes?
Yes ( ) No ( )

Does the laboratory hold any form of accreditation?
Yes ( ) No ( )
If yes, indicate below relevant standards, accreditation bodies, year

Governmental		
Private national Body		
International		
Name of Accreditation Body		
Address of Accreditation Body		
Year of accreditation		

Scope of accreditation / parameters

	Parameters	Matrix	Method
1			
2			
3			
4 ….			

Appendix 6: Self-assessment survey of Competent Authority capacities

To what extent do you agree with the following statements?

Please respond using the five-point rating on the extent to which you agree with the statement.

Please relate to the parts of the food safety system for which you are responsible.

Questions	**Answering Options**				
	Strongly Agree	**Agree**	**Don't Know**	**Disagree**	**Strongly Disagree**
Policy and legal framework					
Our current legislation is up to date and in line with international standards such as Codex Alimentarius.					
Our legislation provides a clear allocation of responsibilities for food safety risk management for both exports and domestic markets, without overlaps or gaps.					
Government has in place a system for ensuring that sanitary controls in our sector are subject to a periodic review.					
Our Competent Authority has applied sanctions against non-compliant operators during the last year.					
Infrastructure and finances					
Adequate budgets are provided by the Government for operational expenses of our competent authority (inspections, sampling and testing)					
Our control activities and resources are applied at appropriate times and places, whenever and wherever food sector activities take place					
Our inspectors have sufficient equipment (including transport) to perform their job effectively.					
Adequate laboratory testing facilities are available (in terms of scope and capacity of testing) to meet all the needs of the food safety system.					

In case of a food safety emergency, food control laboratories have the capabilities and versatility to adapt to the resulting changes / surges in demand of tests to be performed					
Human resources					
Adequate number of competent staff are employed and receiving regular training to ensure the delivery of functions required for national food control.					
Implementation of core control activities					
A central mechanism for implementation of controls is defined and documented (i.e. SOPs, manual, TOR, etc.) and includes all relevant Competent Authorities					
Our Competent Authority produces and publishes an annual control plan, setting out control targets					
Our Competent Authority produces and publishes and annual report setting out the food safety status of the sectors under control					
Our competent authority implements a periodic monitoring (sampling and testing) which indicates where food safety hazards within the mandate of my competent authority are under not under official control.					
Implementation of specific functions					
Our Competent Authority has designed a coherent risk based programme for control measures, taking into account relevant information (i.e. on product type, country of origin and importer's history)					
Our inspection and official control activities are subject to a periodic formal audit to ensure that performance levels meet specific targets.					

Our food safety system can identify occurrences of food borne disease reported by patients to their doctor.					
Our Competent Authority has a written crisis management plan which is routinely tested to establish its efficacy.					
Domestic stakeholders					
High risk categories of Food Business Operators (FBOs) are defined and receive additional focus of official control resources					
International stakeholders					
We maintain a database of contacts with named individuals in Competent Authorities in countries with which we trade (both import and export)					
An INFOSAN Emergency Contact Point is designated and registered on the INFOSAN Community Website.					
Evidence / risk base					
Inspectors in our Competent Authority are concerned that not all of the important food safety hazards which I am responsible for are under official control					
Data from routine monitoring and surveillance are utilized for informing new risk analysis activities or for the review of former risk analysis activities.					
Food safety measures applied by our Competent Authority are based on a quantifiable assessment of food safety risks					

Appendix 7: Draft Regional Quarterly Newsletter on Fish Sanitary Controls

Proposed Title: Caribbean Fish Safety News

World Seafood Congress to be held in Iceland, September 2017

The International Association of Fish Inspectors (IAFI) has announced that the World Seafood Congress will be held 10 – 13 September 2017 in Reykjavík, Iceland, in collaboration with MATIS the Icelandic Food and Biotech R&D institute. The theme of the Congress is Growth in the Blue Bio-economy and the four-day event will include presentations addressing a practical approach and cutting edge research for market innovation in safe seafood supply and food integrity. This event, which takes place every two years, brings together researchers, fish inspectors, fish quality control professionals and seafood processors and traders from all over the world. The event is sponsored by a range of institutional and commercial sponsors, including the FAO and UNIDO who will fund participation from developing countries. As always the first day of the event will be dedicated exclusively to regional meetings for colleagues from developing regions, with special sessions for Latin America and the Caribbean, Africa and Asia. Abstracts for oral and poster presentations are now being accepted for all sessions. A poster competition for younger researchers will also be held. The event is timed to coincide with IceFish, the Icelandic Fisheries Exhibition, Iceland's premier commercial exhibition for the fishing, processing and aquaculture industries which will be held 13 - 15 September 2017.

The last Congress was held in 2015 in Grimsby UK, and a 2019 Congress will be held in Ho Chi Minh City, Vietnam. Attendance at the Congress includes two years of membership of IAFI. More information regarding the Congress is available at http://www.wsc2017.com/ .

The International Association of Fish Inspectors (IAFI) was established in 1999 to serve the world fish inspection community. IAFI exists to promote the exchange of ideas and information, foster interaction, understanding and professional collaboration among individuals, organisations, and governments, disseminate knowledge about seafood and associated products inspection, and promote advancement of the state-of-the-art in fish inspection research and education. For more information visit http://www.iafi.net.

Last meeting of the Codex Committee on Fish and Fishery Products

The FAO and WHO have finalised the documentation from the 34th and last physical meeting of the Codex Committee on Fish and Fishery Products (CCFFP) held in Ålesund, Norway, 19 – 24 October 2015 and attended by technical experts, senior administrators and researchers from 49 member countries, one member organization (EU) and one international organization.

The Committee was established in 1966 to produce worldwide standards for fresh, frozen or otherwise processed fish, crustaceans and molluscs. Over the years the committee was responsible for development of a range of standards for fish and fishery products, including

- Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories (1999)
- Model Certificate for Fish and Fishery Products (2004)
- Standard for Quick Frozen Finfish, Uneviscerated and Eviscerated (1995)
- Standard for Canned Finfish 2016
- Standard for Quick Frozen Blocks of Fish Fillets, Minced Fish Flesh and Mixtures of Fillets and Minced Fish Flesh 2016

- Standard for Quick Frozen Fish Sticks (Fish Fingers), Fish Portions and Fish Fillets - Breaded or in Batter 2016
- Standard for Salted Fish and Dried Salted Fish of the Gadidae Family of Fish2016
- Standard for Quick Frozen Fish Fillets 2014
- Standard for Crackers from Marine and Freshwater Fish, Crustaceans and Molluscan Shellfish 2016
- Standard for Fish Sauce 2013
- Standard for Smoked Fish, Smoke-Flavoured Fish and Smoke-Dried Fish 2015

In the last meeting, the participants finalised the sections in the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) with regard to processing of fish sauce, fresh and quick frozen raw scallop products and sturgeon caviar. The Committee decided to discontinue continue work on modified atmosphere packaging (MAP) for fishery products, but decided that the outstanding issues of food additives, and sampling and control of histamine should be finalised through correspondence.

Norway, as chair of the Committee, thanked all delegations for their valuable contributions and work on finding consensus on important issues over the years. Norway underlined the need for delegations to continue good work on seafood issues, to coordinate their work in the national arena and to use the Codex general subject committees for future seafood matters.

"Significant risks" claim for consumption of Trinidadian fish and shrimp from Gulf of Paria

Following an oil spill in December 2013, evidence is emerging of significant and persistent contamination of fish in the Gulf of Paria, a semi-enclosed inland sea located between the island of Trinidad (Republic of Trinidad and Tobago) and the east coast of Venezuela. The spill, arising from a break in a pipeline operated by Trinidad's national oil company, Petrotrin, resulted in a reported 8,000 barrels of oil being released over a period of several days. The impacts have recently been investigated by the NGO Fishermen and Friends of the Sea (FFOS), by sampling and testing of fish and sediment, with analysis undertaken by the Caribbean Industrial Research Institute (CARIRI) and University of Trinidad and Tobago (UTT). The results suggest high levels of Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons (PAH) in the flesh of bottom dwelling species of fish and shrimp, as well as in sediments. These are all persistent organic pollutants, and several of the compounds identified are known to be highly carcinogenic. According to Dr. Natasha Ramroop Singh and Professor Valerie StouteIt of the UTT, writing in September 2016, "*it is clear that the Gulf is significantly contaminated with a variety of Persistent Organic Pollutants (PAHs and PCBs)*" and "*their presence in the marine ecosystem will eventually lead to higher and higher levels in fish and, when consumed by people, to high levels in humans, thereby posing a significant threat to human health*". The NGO Fishermen and Friends of the Sea has called on the government of Trinidad and Tobago to close the fishery, compensate the fishermen for their loss of income, and de-contaminate the area.

EU project identifies emerging hazards in seafood

The ECsafeSEAFOOD project is a four-year research project that aims to evaluate food safety issues related to contaminants present in seafood as a result of environmental contamination. One of the leading institutions, the Norwegian Veterinary Institute (NVI) has hosted a seminar on contaminants of emerging concern in seafood addressing xenobiotic contaminants, algal biotoxins, environmental factors, climate change, micro-plastics and other emerging factors potentially affecting the safety of seafood, and which are not currently addressed in EU legislation. The project will also host a stakeholder event and open science meeting "Seafood Safety: New Findings & Innovation Challenges" to be held in Brussels in

January 2017. ECsafeSEAFOOD is led by the Instituto Português do Mar e da Atmosfera (IPMA), and has a budget of more than €5 million.

SPS Professionals from CARIFORUM receive food safety management training in Iceland

Eighteen professionals from CARIFORUM recently received management training on Sanitary and Phytosanitary Measures (SPS) at the UN University Fisheries Training Programme in Iceland. The training was offered under the capacity-building component of an EU-sponsored project to implement SPS Measures under the 10th European Development Fund (EDF) regime, through a component implemented by the Inter-American Institute for Co-operation on Agriculture (IICA) and the Caribbean Regional Fisheries Mechanism (CRFM).

The two-week training course in Iceland was delivered to food safety professionals representing all CARIFORUM Countries, and addressed a range of food safety topics, with a strong reference to the seafood sector. CRFM's Deputy Executive Director Dr. Susan Singh-Renton said that, "The CRFM / UNU-FTP SPS Management Course has been very successful in achieving its objective of exposing CARIFORUM fisheries and agricultural health and food safety experts to the key lessons and best practices of the Icelandic fishing industry in producing safe and wholesome fishery products of an international standard."

The course was praised by the participants, Director of fisheries resources at the Dominican Council for Fisheries and Aquaculture (CODOPESCA) in the Dominican Republic, Jeannette Mateo, suggested that biologists, inspectors, fisheries officers and consumer protection agents in her country should be trained in basic concepts of SPS. "One of the more frequent but often overlooked problems within the Caribbean is food fraud and mislabelling," noted Dr. Wintorph Marsden, Senior Veterinary Officer in Jamaica's Ministry of Industry, Commerce, Agriculture and Fisheries. Marsden said that Jamaica is considered a major trans-shipment hub for fish and fishery products to the wider Caribbean, and so the burden is on Jamaica, as a first point of entry, to implement a system of verification of products entering its food chain.

Chairman of the Caribbean Fisheries Forum, Denzil Roberts, who is also the Chief Fisheries Officer in Guyana, noted that "the fisheries sector within the CARIFORUM region continues to play an important role in rural development, food and nutrition security, income generation and foreign exchange earnings. Dr. Singh-Renton said that the CRFM will also strive to do its part to provide follow-up regional support for improved SPS management for the region's fishing industries, including facilitating continued networking among the course participants. She added that, "At the close of the course, participants reflected on, and also documented, how they would apply what they had learned to improve fisheries SPS management in their home countries".

Grant funding for attendance of young fish technologists at the 2017 World Seafood Congress

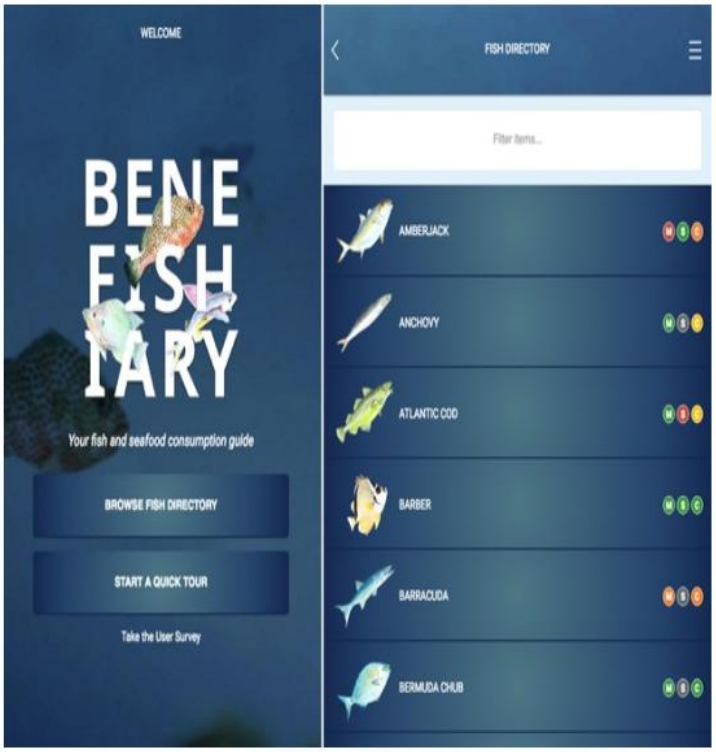
The IAFI Peter Howgate Award is a tribute to Peter Howgate's work and career, and a recognition of his immense, and ongoing contribution to the field of fish technology and the people who work in it, both during his 35 years at the UK's Torry Research Station, UK, and thereafter. The Award was set up by fish technology professionals around the world, with the help of the Seafood HACCP Discussion List community and was adopted by the International Association of Fish Inspectors (IAFI) in 2014.

The 2017 Peter Howgate Award will fund the attendance of a young fish technologist (under 30 years of age) to the IAFI World Seafood Congress 2017 (see http://www.wsc2017.com), to be held in Reykjavik, Iceland, from 10 - 13 September 2017. The Congress is being held to coincide with the Icelandic Fisheries Exhibition from 13 - 15 September 2017. The Award will cover travel, accommodation and the

congress fee, and this will afford the winning applicant a career changing opportunity to gain insights and build networks in the global fishery sector. The deadline for submission of applications is **31 March 2017**. More information and an application form are available at www.peterhowgateaward.com. You can also visit the Facebook page for updates and information about previous awards (https://www.facebook.com/PeterHowgateAward).

University of Hawaii designs new app to assess benefits and risks of fish consumption

BeneFISHiary, an app created in part by University of Hawaii provides location-specific data and the risks and benefits of Bermudian fish species. The app was developed by University of Hawaii in collaboration with the Ocean and Human Health Research Programme and HUACTIVE. The app enables the users to search or browse about fish species and get detailed information about the mercury concentrations and nutrients such as selenium and omega-3 fatty acids. It also provides information about the sustainability of local and imported fish, as well as which lower mercury level fish can substitute for their higher relatives. The app was developed following a study "Examining the Impact of a Public Health Message on Fish Consumption in Bermuda" which found that public health messaging warning of the dangers of mercury exposure from consumption of certain fish appeared to be effective, but adjustments needed to be made to promote consumption of healthy and sustainable fish with lower mercury levels. The BeneFISHiary app was created to help consumers make those adjustments, as well as healthcare providers who counsel pregnant women. The BeneFISHiary app currently in a beta version, was recognized with a 2016 International Association for Ecology and Health Small Grant Award. Source: www.hawaii.edu



Appendix 8: Press Release No. 1

PRESS RELEASE

EU works with the Caribbean Regional Fisheries Mechanism to help to make Caribbean fishery products safer

A fisheries and aquaculture food safety capacity building activity, funded by the EU and delivered under the technical leadership of IICA and the CRFM, is helping CARIFORUM countries to improve the safety of fish and fishery products for consumers in national and export markets. The activity, which is part of a broader programme and which started in September 2016 and will run until January 2017, has prepared eight new manuals to help fish inspectors apply the best international practices to the inspection of fishing vessels, processing establishments and aquaculture facilities. The subjects covered include HACCP, traceability, and for the first time, a compendium of food safety hazards encountered in Caribbean fishery products. In addition, the project has prepared two manuals for laboratories, on the testing of fishery products to make sure they are safe, and ensuring that laboratory test results are accurate.

To help disseminate these new manuals, the project will also run two one-week courses for 30 participants from CARIFORUM countries, to be held in Saint Vincent and the Grenadines at the end of November 2016. This will present the manuals, as well providing training in best international practices in fish inspection, and demonstrating some of the modern approaches to rapid and field testing to allow better decisions to be made about the safety of fishery products. The course will be attended by participants from Antigua and Barbuda, The Bahamas, Barbados, Belize, the Commonwealth of Dominica, the Dominican Republic, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Suriname, Saint Vincent and the Grenadines and Trinidad and Tobago.

The fishery sector is important for many countries in the region, as a source of employment, and export revenues. Overall, in 2015, the CARIFORUM countries exported fish worth US$378 million to many countries around the world. Whilst 89% of this is from just five countries (Bahamas, Belize, Guyana, Suriname and Trinidad and Tobago) the fishery sector of many other countries in the region delivers supplies directly to their tourist sector. The continued economic importance of the fishery revenue therefore depends on making sure that fish meets international sanitary standards, and governments in the region are therefore very interested to ensure that typical food safety hazards such a ciguatera and histamine are under control.

The project “Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade” is implemented by the Inter-American Institute for Cooperation on Agriculture (IICA). The objective of the project is “*To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.”*

In this task IICA is supported by the Caribbean Regional Fisheries Mechanism (CRFM) and, for the present training activity, also by a team of consultants from Megapesca in Portugal. The project is financed under the EU project “10th EDF Sanitary and Phytosanitary Measures Project”. The expected result of the current activity is that capacities will be strengthened at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

Photo Caption:
Fishing and processing conch is an important economic activity for many Caribbean States
Credit: Megapesca Lda., Portugal

ANNEX 4: LIST OF TRAINING VIDEOS PRODUCED

Video Filename	Title	Description
Opening Ceremony Fishery Products Laboratory Testing 28.11.16	Course opening ceremony	Opening remarks by Mr. Raymond Ryan (Permanent Secretary, Ministry of Agriculture, St. Vincent and the Grenadines), Mr. Michael Dalton (IICA Representative to St. Vincent and the Grenadines), Mrs. Jennifer Cruickshank-Howard (Chief Fisheries Officer, St. Vincent and the Grenadines), Dr. Susan Singh-Renton (Deputy Executive Director of the Caribbean Regional Fisheries Mechanism Secretariat) and Dr. Ian Goulding, Course leader, Megapesca Lda.
VIDEO_c1microbiological Water test	Microbiological water testing	The lecture addresses standard methods for testing water and ice safety and quality based on the requirements of the EU drinking water directive and by use of ISO standards. It also covers trends in water quality testing for human consumption and alternative methods. Specific methods are described for testing for E. coli and coliform bacteria by use of chromogenic media and enumeration of culturable microorganisms, colony count at 22 °C and 36 °C and for testing for Clostridium perfringens. It covers techniques of membrane filtration and enumeration including quality assurance and validation. It especially aims at introduction new ISO standards and tests by use of chromogenic media.
VIDEO_c2microbiological Testing for fish	Microbiological testing for fish, fishery products, sea shellfish and molluscs	The session covers EU standard methods for microbiological testing for fish, fishery products, shellfish and molluscs covering typical hazards in the Caribbean region. It defines microbiological criteria and addresses sampling, sample preparation, procedure, technique/media, result expression, quality assurance and validation, and provides an overview of possible alternative methods. The lecture also describes examples of colony count at 30°C and detection of salmonella in cooked crustaceans and molluscs shellfish and live bivalve molluscs, live echinoderms, tunicates and gastropods.
VIDEO_c3biolan1	Practical work: demonstration and group work of BIOFISH 300	This lecture continues the session on histamine analysis (using the example of canned fish) showing the practical hands-on

	(BIOLAN) histamine determination	experience of: 1. Sample preparation 2. Extraction and Measuring of the sample. The session concludes with a discussion on the context for application of rapid histamine testing.
VIDEO_c3biolan2	Practical work: demonstration and experience of BIOFISH 300 (BIOLAN) histamine determination	This lecture describes and demonstrates a fast, easy and reliable test for quantification of histamine in fish by an enzymatic biosensor (BIOFISH 300). The method can be used for determination of histamines in raw, canned, cooked and salted fish and in fish meal. The session covers and explanation of the method's basis and calibration.
VIDEO_c4histamine Analysis in fish	Histamine analysis in fish	The lecture describes the EU official test method for histamine determination in certain fish species including sampling and sample preparation, reporting of results and validation.
VIDEO_c5determinationof Heavy metals in fish	Chemical and toxin testing in fish and fishery products	The lecture reviews the analytical methods for determination of some of the major chemical hazards - heavy metals (cadmium, lead and mercury), sulphur, marine biotoxins – which should be subject to control and testing in fish and fishery products from the Caribbean region with relevance for trade to EU. The session covers the equipment required, sampling, sample preparation, and testing methods to be applied, as well as performance criteria, expression of results and quality assurance.
VIDEO_c6Biopharm	Demonstration and group work of rapid test kits related to microbiological determination.	The lecture introduces and demonstrates the BIOPHARM test kits for rapid microbiology tests. The session includes demonstration of the application of these tests to surfaces, water and fish using: • Rapid Swabbing methods using – RIDASTAMP TOTAL, RIDASTAMP SALMONELLA • Rapid detection of Pathogens – COMPACT DRY SALMONELLA • BIOPHARM COMPACT DRY TOTAL test kits.
VIDEO_c6aRidascreen	Use of competitive enzyme immunoassay	This lecture introduces and demonstrates an alternative rapid test method for detection of

	tests for the screening of samples for histamine	histamine in fishery products – using the BIOPHARM RIDASCREEN HISTAMIN (enzymatic) test kit
VIDEO_c7ridascreenpractical	Continuation of histamine screening tests	This session demonstrates practical group work on detection of the histamine hazard in fish – RIDASCREEN HISTAMIN (enzymatic)
VIDEO_c8biopharmpremitest	Use of rapid test kits for detection of antibiotics in fish and shrimps	The lecture introduces and demonstrates a rapid test method for detection of antibiotics in fish and shrimps using BIOPHARM PREMITEST
VIDEO_c8biopharmpremitest	Continuation of use of rapid test kits for detection of antibiotics in fish and shrimps	This video shows a session with practical group work Detection of antibiotics in fish and shrimps using the BIOPHARM PREMITEST
VIDEO_c9labqualityassurance PART1	Quality assurance in fish testing laboratories Part 1	This lecture introduces the topic of laboratory quality assurance, considering the accuracy of test results in microbiological and chemical testing in fish and fishery products. It outlines the scope and the requirements set out in ISO / IEC 17025, with regard to accommodation and environmental conditions, facilities, personnel, equipment and maintenance, reagents and culture media, sampling and management requirements and other factors relevant for the competence of testing and accuracy of results.
VIDEO_c10labqualityassurance PART2	Quality assurance in fish testing laboratories Part 2	This lecture provides further details for ensuring the accuracy of test results in fisheries labs, addressing test methods and validation, performance verification, reference materials, reporting of results and quality assurance.
VIDEO_c10labqualityassurance PART2	Quality assurance in fishery laboratories Part 3 - accreditation	The lecture considers the specific requirements and steps towards accreditation of laboratories in line with ISO 17025 and requirements.
VIDEO_c11laboratory Financial analysis	Business planning for laboratories	This lecture provides an introduction to business planning for laboratories addressing the costing of testing services, pricing, profit and loss, breakeven, SWOT analysis and preparing a business plan. It also demonstrates a simple case study regarding options for investment in different analytical methods.

Video Filename	Course Title	Description
Opening Ceremony Food Safety Fishery Products 05.12.16	Course opening ceremony	Opening remarks by Mrs. Jennifer Cruickshank-Howard (Chief Fisheries Officer, St. Vincent and the Grenadines), Dr. Susan Singh-Renton (Deputy Executive Director of the Caribbean Regional Fisheries Mechanism Secretariat) and Dr.Ian Goulding, Course leader, Megapesca Lda.
VIDEO_i1foodsafety	1. Food safety, international trade and the fishery sector	The lecture sets the international context for the development of sanitary controls in the fishery sector. It addresses the role of the SPS Agreement and Codex Alimentarius Commission, and introduces participants the concepts of risk management and official control in the context of international standards. Manual for the Inspection and Official Control of Caribbean Fishery Products. *CRFM Special Publication*. No.9.
VIDEO_i2casestudycodex	2. Case study on the Codex standard for smoked fish	This video presents a case study to identify the issues which should be taken into account in the setting of an international standard for the safety of a processed fishery product.
VIDEO_i3classificationhazards	3. Classification of hazards: review of chemical, biological and physical hazards	This lecture addresses the scientific basis for the main food safety hazards encountered in fishery products within the region along with methods of elimination and control. It characterises the most important chemical physical and microbiological hazards. Key hazards covered will be histamine, ciguatera, heavy metals, *Cl.botulinum* and other food poisoning bacteria. Reference: Reference: Guide to Food Safety Hazards in Caribbean Fishery Products. *CRFM Special Publication*. No.11.
VIDEO_i4safetyinfishing operations	4. Food safety conditions in fishing operations	This lecture addresses the design structure and operation of fishing vessels in terms of ensuring the food safety of the catch. It relates food safety conditions to the different species targeted and the fishing gears used, as well as dealing with the post-harvest handling conditions onboard to ensure that product safety and quality is maintained. There will be a special focus on the need to chill histamine producing species. Reference: Manual on Assuring Food Safety Conditions in Capture Fisheries. *CRFM Special Publication*. No.8.

VIDEO_i5safetyinprocessing	5. Food safety conditions in landing and processing	This lecture addresses the design structure and operation of fish landing and processing operations, in terms of ensuring the food safety. It explains how to ensure hygienic conditions, including personal hygiene and standard operating procedures such as pest control, cleaning and sanitising. The context for HACCP and traceability systems is also described. Reference: Manual on Assuring Food Safety Conditions in Fish Landing and Processing. *CRFM Special Publication*. No.12.
VIDEO_i6safetyofwater	6. Safety of water	This lecture addresses water safety, with special reference to treatments to ensure microbiological safety. It will address the chemistry of chlorination, for potabilization and sanitising, as well as approaches to sampling and treatment of water. It also review cleaning and sanitising methods. Reference: Manual on Assuring Food Safety Conditions in Fish Landing and Processing. *CRFM Special Publication*. No.12.
VIDEO_i7practicalsession PHTHERMOMETERS	7. Practical session: (a) water safety and pH / Cl testing; (b) use of thermometers	This practical session shows participants undertaking the: a) analysis of free and combined chlorine and pH in potable water using Lovibond test kits. b) Reviews the use of thermometers and temperature logging tools in assessing safety of fishery products Reference: Manual on Assuring Food Safety Conditions in Fish Landing and Processing. *CRFM Special Publication*. No.12.
VIDEO_i8implementationHACCP	8. Implementation of HACCP systems	This lecture reviews the HACCP system, as a means of ensuring that food safety hazards are under control. It summarises the 7 principles of HACCP, using examples from the fishery sector (specifically in relation to the histamine and ciguatera hazards). Reference: CRFM Guidelines on Developing and Implementing HACCP Plans for Fish and Fishery Products, September 2015.
VIDEO_i9officialcontrols1	9. Official controls 1.	This lecture addresses the important issue of the organisation and management of Competent Authority functions, covering matters such as organisation structure, and

		ensuring the integrity of the control system. *Reference:* Manual for the Inspection and Official Control of Caribbean Fishery Products. *CRFM Special Publication*. No.9.
VIDEO_i10officialcontrols2	10. Official controls 2	This lecture considers the role of the inspector, the role of checklists and scoring systems, the importance of setting out non-compliance procedures, and describes the need and approach to certification and annual control plans and reports. *Reference:* Manual for the Inspection and Official Control of Caribbean Fishery Products. *CRFM Special Publication*. No.9.
VIDEO_i11riskbasedinspections	11. Risk based inspections	This lecture considers the detailed approach to applying principles of risk management in the design and implementation of an inspection systems. It describes the risk profiling of establishments based on severity and frequency of hazards, assessing compliance history and use of risk profile data in allocation of control resources. It also reviews the organisation of border controls and considers how risk factors should be applied in the design of border inspection functions. *Reference:* Manual for the Inspection and Official Control of Caribbean Fishery Products. *CRFM Special Publication*. No.9.
VIDEO_i12foodsafety Hazards aquaculture	12. Food safety hazards in aquaculture; veterinary medicines, aflatoxins	This lecture considers some of the special food safety issues to be addressed in aquaculture, with particular reference to species produced within the region (shrimp and tilapia). Specific hazards (aflatoxins and veterinary medicines) are described and control methods considered. *Reference:* Manual on Assuring the Food Safety of Aquaculture Products. *CRFM Special Publication*. No.10.
VIDEO_i13designandimplementation Monitoring programs	1. Food safety controls in aquaculture; monitoring requirements and inspection of aquaculture facilities	This lecture considers monitoring programmes for fish and fishery products, along with the design of sampling and testing protocols (including screening). Specific requirements for inspection and control of aquaculture establishments are covered, and implications considered for HACCP plans and traceability. *Manual References:* Manual on Assuring the Food Safety of

		Aquaculture Products. *CRFM Special Publication*. No.10.
VIDEO_i14traceabilitysystemsPART1	2. Traceability systems for fishery and aquaculture products Part 1	This lecture describes the reasons for traceability (food safety, tariffs and IUU fishing requirements) and sets out both the regulatory basis and voluntary certification. Key features of traceability systems are described, along with different approaches such as internal and external traceability, batch separation and data recording. Manual on Traceability Systems for Fish and Fishery Products. *CRFM Special Publication*. No.13.
VIDEO_i15traceabilitysystemsPART2	3. Traceability systems for fishery and aquaculture products Part 2	This lecture considers some of the more detailed features of the implementation of traceability systems such as product withdrawal and recall; inspection of traceability; international coding systems, crisis management; traceability tools and data logging systems (example of Timestrip system). *Reference:* Manual on Traceability Systems for Fish and Fishery Products. *CRFM Special Publication*. No.13.
VIDEO_i16Case study Pacific Regionalise Inspection	4. Presentation of an approach to regionalisation of sanitary inspections for fishery products	The session presents a short description of a case study on the design of the Pacific Regional Competent Authority Support Unit (RECAS) and relates the experience to the Caribbean region.
VIDEO_i17regionalisefish Inspection control	5. How to regionalise functions related to inspection and control of fishery products: Open session: discussion on implementation of strengthened sanitary controls in the Caribbean fishery sector	Discussion session on the subject of ways to strengthen sanitary inspection and control of fishery products in the region, with particular emphasis on regional coordination

ANNEX 5: REPORT ON TRAINING WORKSHOPS AND EQUIPMENT DELIVERED

REPORT ON TRAINING WORKSHOPS AND EQUIPMENT DELIVERED

under the project

Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

Dr. Ana Cristina d'Aiutolo of BIOPHARM demonstrates rapid microbiological test methods to participants from testing laboratories in CARIFORUM countries

CONTENTS

1 INTRODUCTION

This Report is submitted by Megapesca Lda of Portugal, a food and fisheries consultancy firm established in 1994.

The report describes the activities and results related to the delivery of two training workshops under the Project "*Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade"* implemented by the Inter-American Institute for Cooperation on Agriculture (IICA) under the EU funded project "10th EDF Sanitary and Phytosanitary Measures Project". The Caribbean Regional Fisheries Mechanism (CRFM), based in Saint Vincent and the Grenadines is nominated by IICA as responsible for the coordination of the technical implementation of the project.

The project commenced on signature of the contract on 26 August 2016, and is expected to finish in January 2017.

2 DESCRIPTION OF THE INTERVENTION

2.1 Objective

The objective of the project, according to the ToR is:

To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

2.2 Project results

The project aims to:

- Develop at least 8 food safety operational manuals for field, laboratory, market and trade (import and export) to support the activities of designated persons and institutions responsible for the safety of fish and fish products;
- Develop training programmes for improving official control and testing laboratory skills in SPS quality management of fish and fish products, (including the supply of relevant equipment);
- Deliver the training programmes in short courses in the region;
- Design and implement Impact Assessment Tools; and
- Design relevant communication and visibility products.

The expected result is that capacities will be built at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

3 ACTIVITIES UNDERTAKEN

The specific result which is addressed by the activities described in this report concern the development of the training programmes for improving official control and testing laboratory skills in SPS quality

management of fish and fish products, (including the supply of relevant equipment) and the delivery of the training programmes in two short courses in the region.

3.1 Preparation of training manuals

The consultants prepared eight operations manuals which provided the source material for the training courses, as follows:

1. Manual on Assuring Food Safety Conditions in Capture Fisheries
2. Manual for the Inspection and Official Control of Caribbean Fishery Products
3. Manual on Assuring the Food Safety of Aquaculture Products
4. Guide to Food Safety Hazards in Caribbean Fishery Products
5. Manual on Assuring Food Safety Conditions in Fish Landing and Processing
6. Manual on Traceability Systems for Fish and Fishery Products
7. Manual on Laboratory Testing of Fisheries Products
8. Manual on Laboratory Quality Assurance

These were drafted and circulated for comment to prospective training course participants and CRFM Secretariat. Comments were received from eight stakeholders, including the CRFM Secretariat, and the manuals were revised accordingly.

Fifteen copies of each revised manual were printed as course materials and distributed to the participants at the commencement of each training course.

3.2 Organisation and delivery of training courses

3.2.1 Venue, dates and resource persons

The training courses were delivered by the resource persons indicated below at the Beachcombers Hotel, Saint Vincent and the Grenadines on the following dates:

Course title	Dates	Resource persons
Fishery Products Laboratory Testing	Monday, 28 November 2016 to Friday, 2 December 2016	Dr. Christine Froese, Specialist in Food safety testing laboratory management and ISO17025, Megapesca Lda. Dr. Ana Cristina d'Aiutolo of BIOPHARM, Germany Mr. Iñigo Hernandez of BIOLAN, Spain Dr. Ian Goulding, Team Leader / Food Safety Specialist, Megapesca Lda
Food Safety In The Fishery Sector	Monday, 5 December 2016 to Friday, 9 December 2016	Dr. Ian Goulding, Team Leader / Food Safety Specialist, Megapesca Lda

3.2.2 Participants

The consultants supported the CRFM in the selection of participants from lists suggested by the parent Ministries of participating CARIFORUM countries. The participants were drawn from Competent Authorities responsible for official controls in the fishery sector and laboratories responsible for testing of food safety parameters of fishery products (as well as regional organisations such as the Caribbean

Agricultural Health and Food Safety Agency - CAHFSA). Fifteen individuals were selected to participate in each training course. A list of attendees for each course is shown in *Appendix 1*. Two additional observers from the Fisheries Department, St. Vincent, joined the course on Food Safety in The Fishery Sector.

3.2.3 Course logistical arrangements

The consultants made the necessary arrangements for the participants' travel including booking and paying for air tickets, arranging transfers and overnight stays.

The detailed arrangements for the subsistence, accommodation, catering, airport transfers, per diems for the training workshop were made by the consultants, in line with the proposals and specifications set out in the inception report. A suitable training room at the Beachcombers Hotel was booked for the relevant dates. Attendance certificates were drafted and approved by CRFM.

3.2.4 Course formalities

The Training Course on Fishery Products Laboratory Testing was opened by Mr. Raymond Ryan (Permanent Secretary, Ministry of Agriculture, St. Vincent and the Grenadines), Mr. Michael Dalton (IICA Representative to St. Vincent and the Grenadines), Mrs. Jennifer Cruickshank-Howard (Chief Fisheries Officer, St. Vincent and the Grenadines), along with Dr. Susan Singh-Renton (Deputy Executive Director of the Caribbean Regional Fisheries Mechanism Secretariat). At the end of the course, Certificates of Attendance were presented to each candidate by Dr. Christine Froese, Megapesca Lda and Dr. Susan Singh-Renton, Deputy Executive Director, CRFM Secretariat. The opening ceremony was attended by local press and TV.

The Training course on Food Safety in the Fishery Sector was opened by Dr. Susan Singh-Renton, Deputy Executive Director, CRFM Secretariat. At the end of the course, Certificates of Attendance, and a set of inspection equipment (digital thermometer and water quality test kits) were presented to each candidate by Dr. Ian Goulding, Megapesca Lda and Dr. Susan Singh-Renton, Deputy Executive Director, CRFM Secretariat.

Group photographs were taken for each training course, along with photographs of the official speeches, and presentations of certificates to each participant. These were used for the development of press releases announcing the course. These are available for download at the following link and the CRFM website (http://www.crfm.int/): https://1drv.ms/f/s!AoS3PEEHz3swx1MtZ5dVzhjA2riO

Megapesca Lda hosted a social evening for participants (comprising cocktails and dinner) for each of the two training courses, held on the evening of Thursday, 1 December and Thursday, 8 December 2016 at the Grand View Grill, St. Vincent and the Grenadines.

3.2.5 Technical content of the course

The resource persons prepared curricula for the training course, setting out the activities, titles and content for each training session. These were reviewed by IICA and the CRFM. Copies of the curricula are shown in *Appendix 2* for the course on Fishery Products Laboratory Testing and *Appendix 3* for the course on Food Safety in The Fishery Sector.

The resource persons developed and delivered course materials for each session using MS Power point, and which referred to the manuals. The courses also included practical demonstrations and exercises using the equipment supplied (see below).

The course content was based around the content of the 8 Operations Manuals prepared under the project. However, this was extended to focus on aspects of the practical implementation of food safety control systems and laboratory testing methodologies and practices. The approach was specifically tailored to the Caribbean region, with extended content in relation to the histamine and ciguatera hazards. The approach was highly participative, with examples provided and ample opportunities for discussion.

The following practical exercises were also included, which provided opportunities for the participants to gain direct experience in new methodologies:

Fishery Products Laboratory Testing:

- Histamine analysis using the BIOLAN rapid testing method
- Rapid microbiological testing (BIOPHARM)
- Rapid testing for veterinary medicines (BIOPHARM)
- Rapid testing for histamine (BIOPHARM)
- Case study – financial analysis for laboratory investment

Food Safety in The Fishery Sector:

- Case study: risk management decision making for polyaromatic hydrocarbons (PAH) in smoked fish
- Case study – financial analysis for laboratory investment
- Practical session- water quality testing

Both courses ended with an open discussion session, in which the participants engaged in discussions regarding the application of the course content to their work, and shared views on how to gain value added from regionalisation.

The course PowerPoint materials were made available to participants for download at the following link. https://1drv.ms/f/s!AoS3PEEHz3swx1MtZ5dVzhjA2riO

The materials are also available on the CRFM website: http://www.crfm.int/

3.3 Procurement of laboratory and other equipment for the training course

Equipment required to support the course activities was specified, suppliers were identified and the following equipment was procured and shipped to St. Vincent and the Grenadines, in time for the course.

	Equipment	Suppliers
1	15 x Lovibond comparators (potable water testing) AF116 PH and Chlorine Kit in Case	OilWater Industrial - Serviços e Representações Rua dos Remolares 14, 3º - 1200-371 Lisboa Tel: +351 219 537 915 Fax:+351 213 469 078 www.oilwater.pt
2	1 x BIOFISH Histamine analysis systems (Rapid method) BIOFISH 300-003 (Histamine AOAC) s/No.: 16022 BIOLAB BIOFISH (Pipettes / pump / bottles)	BIOLAN Laida Bidea Edificio 409 · Parque Tecnológico de Bizkaia 48170 Zamudio, Bizkaia SPAIN www.biolanmb.com
3	15 x Digital Thermometers with	AMBIFOOD

	External Probe P300	Edifício Porto Magnum Rua Dominguez Alvarez, nº 44, 4.16 4150-801 PORTO www.ambifood.com
4	1 set x Video and audio recording equipment (see below for details)	Proactive (UK) Ltd. Unit 1 Eastman Way Hemel Hempstead, Hertfordshire HP2 7DU UK Web: www.proav.co.uk
5.	1 x ViewSonic video projector*	Just Projectors Ltd. Campbel Court, Brmaley, Padley, Hampshire, RG26 5EG UK

*Carried by hand by the consultants.

Details of the video and audio recording systems delivered are as follows:

Qty	Item Description	
3	GY-HM170E	JVC GY HM170 S/No: 17040645, 17040687, 17040648
3	CN-1051	Proactive Lens Cleaning Kit
3	PCC	Proactive Cleaning Cloth
3	S-8823	Swift S-8823 High Capacity Battery S/No.: 00114509, 00114521, 00114523
2	EG03A2	E-image EG03A2 Aluminium Tripod Kit S/No.: 7968, 7969
2	Oscar S50	E-Image Oscar $50 Small Camcorder Bag
2	NTGI	Rode NTGI Microphone S/No.: 0099383, 0099351
2	C-XLQM/XLQF-1	Kramer C-XLQM/XLQF-1 XLR (M-F) Cable 0.3M (30cm)
2	C-XLQM/XLQF-1	Kramer C-XLQM/XLQF-15 XLR (M-F) Cable-4.6M
2	HD 201	Sennheiser HD 201 Professional closed-Back Headphones S/No. 0316015815, 0316015817
2	EW 112-P G3 GB	Sennheiser EW 112 P G3 GB Portable wireless microphone system S/No.: 8236127893, 8316162756
2	Boompole	Rode Boompole Telescopic Boom Pole
2	NTSM4	Rode NTSM4
2	WS6	Rode WS6 Windshield
1	DR100MK2	Tascam DR-100MK2 Stereo recorder with 4 mics and XLR input S/No.: 21R000979
6	SDSDXNE-064G	Sandisk Extreme SDXC Card 64 GB 90MB/s Class 10 UHS-1 U3

All of the above equipment was formally consigned by the consultants to the CRFM, which efficiently arranged for clearance from St. Vincent and the Grenadines customs and delivery to the training venue. Megapesca covered the cost of clearance and the equipment was used during the course.

Supplies of consumable reagents and test kits containing temperature sensitive materials were also procured and carried by the trainers from BIOLAN (supplier of rapid histamine test methods) and BIOPHARM (supplier of rapid microbiological test kits) in their luggage to ensure that they retained their activity and avoid the need for chilled storage on arrival. This included the following items.

	Items	Supplier
1	RIDA®STAMP Total Kit RIDA®STAMP Salmonella Kit Compact Dry TC (Total Count) Compact Dry SL (Salmonella) RIDASCREEN® Histamin (enzymatic) Premi®Test 25	R-Biopharm Latinoamérica V. de Obligado 2943 (1429) CABA 011-4701-6262
2	5 x Biotest Histamine (10 units) 1 x Calibration Kit Histamine 1 x Measurements Kit Histamine (2 units)	Biolan Microbiosensores, Parque Científico y Tecnológico de Bizkaia – Bizkaia España

At the end of the course the Lovibond comparators and the Digital thermometers were donated by the CRFM to the participants of the course Food Safety in The Fishery Sector, who received them on behalf of their Competent Authorities.

3.3.1 Video recording and editing

Video cameras and audio recording system were purchased in the EU and consigned to the CRFM Secretariat, where they were received in good order. Arrangements for the video recording of the training lectures and practical demonstrations were made, along with stills photography for press releases, websites etc. undertaken under a sub-contract by Frost Studio, York, UK.

Approximately 60 hours of filming were undertaken, including fisheries related material at Kingstown Market, St. Vincent. The training videos were professionally edited (to incorporate the power point presentations made and practical sessions delivered by the trainers) to produce a high-quality edited set of video files for future training use in a format suitable for web-distribution.

4 RESULTS – TRAINING EVALUATION

A short training evaluation form was designed and applied at the end of each course to allow an assessment by participants of the relevance, effectiveness, level and quality of delivery of training activities. The results (in the form of average scores against evaluation criteria and comments provided) are shown in sections 4.1 and 4.2.

4.1 Fishery Products Laboratory Testing

In summary the course was assessed as providing quite a lot of new ideas, a good balance of practical and theoretical knowledge, and would be quite useful to the participants. Participants considered that it would allow them to perform better in their work. The pace of delivery was acceptable and the resource persons considered good, as were the logistical arrangements. Comments suggested that the course would make a significant contribution to the job performance of the participants, especially in relation to laboratory quality assurance and business planning. The participants would have preferred laboratory and official control courses to be combined, more practical training / field opportunities and greater variety in the resource persons. The detailed results are shown in Boxes 1a, b, and c.

Box 1a: Evaluation results: Course on Fishery Products Laboratory Testing

Please answer the following questions by circling your score (choice) between 1 - 5 or write your comments in the allocated space. Please note that your answers will be treated confidentially.

1. Overall, how did you find the content of training workshop?

(a) no new ideas	1	2	3	4 4.13		5	lots of new ideas
(b) too theoretical	1	2	3	3.67	4	5	very practical

2. In respect of your professional work this training workshop was:

of no use	1	2	3	4 4.27	5	very useful	

3. How much better will you be able to do your job as a result of this training workshop?

very little change	1	2	3	3.53	4	5	very much better

4. How did you find the pace of the training workshop?

too slow / quick	1	2	3	3.8	4	5	good pace

5. Overall, how did you find the quality of the resource person(s)

poor	1	2	3	4 4.33		5	excellent

6. How did you find the logistical arrangements (travel, accommodation, catering etc.)

poor	1	2	3	**3.73**	4	5	excellent

7. How did you find communication and sharing of information prior to the training course delivery?

poor	1	2	3	4 **4.13**		5	excellent

Box 1b: All responses received to the question "Please explain how this training will help you to improve your performance in your job, with examples"

The course has provided insight for greater business planning and quality assurance for the future. It will improve my performance by incorporating better business planning. I can also see some areas of the lab that need improving. I can collaborate with others to make this happen.

- Calculating Laboratory costs
- Applying ISO 17075 to areas where it was lacking e.g. Sample reception

Introduce the use of rapid methods by the establishments and inspectors during inspection of imported product.

Enervate my knowledge.
Test Kit Use and how to integrate in the lab.

All analysis you must verify with the ISO standard method.
For histamine analysis, the EU method is not validated so we have validated the method.

This course will allow the stream-lining of laboratory testing capabilities within my country; as the CA, if we aren't required to have a laboratory our resources can be placed in area of other priorities.

Better understanding of what the EU wants. Whether we can reach their expectations to freely trade with minimal interruptions and disputes is another story.

It gave guidance on use of kits and importance of validation and verification. The business planning sector will better help in discussions as to direction of labs and in planning laboratory tests.

With regard to financial planning content the information learned will definitely allow me and my organisation to assess our current situation and plan appropriately for the future.

The exposure to new testing equipment and materials and its application can assist in providing services to producers that weren't available before.

I really think this was a very interesting and very important training. The only problem is that I have too many limitations in my country. It is really hard to perform some correct or at least effective ways or method stabilise by certification or accredited organisations.

Hope all this knowledge and this timing was so useful and that I'll do a better job in my future.
Always following the methods which is important and personally wish I could do it once I am in my country.

Opportunity to find out what is happening in 15 islands. Grateful for the Manuals, demo of kits, shared years' experience in food safety.

It will help through the development of lab budget, performing specific test to meet trade requirement as well as the availability of rapid test methods.

The knowledge I gain I will take it back to my department and suggest certain changes and improvements e.g. WRT the test kits (histamine) I would even advise on the financial aspects.

Box 1c: All responses received to the request "Please indicate how such courses as this could be improved in future"

Improvement can result from merging both the lab course and inspection course so that we can function in supporting each other rather than separating our tasks.

- Training specifically in method validation and verification
- Training in measurement uncertainty
- Training in internal audits
- Practical sessions in an accredited lab
- Chemical testing of water (drinking/potable/marine)

Focus more on practical labs
Site visits.

Training technical assistance in:

- Measurement uncertainty
- Heavy metals analysis
- Benzo (a) pyrene analysis

Integration with laboratories the inspectorate training.
A section that focuses a bit more on uncertainty testing, verification and validation.

I don't know, this one is good.

The courses (this week and next weeks) should be integrated such that there is a simultaneous training of lab and inspectorate. This would greatly enhance the appreciation of one agency for the other.

Use of several resource personnel.

I know this is responsive but we could do this from videos if we have to or in our labs in little groups.

Soft spoken teacher.

Cost of food was very high at hotel

It is wonderful that other partners are involved in this training, such as inspectors. Follow up is necessary post training.

Because it is so theoretical lasting till 5pm is a little long.

Microphone for resource persons; follow up visit or contact with participants.

Some more in-depth information or presentation of the lab quality assurance management system such as quality control charts.

It would be best to leave the practical aspect of the course for after lunch rather than before. Also more group participation is necessary. It was a bit too much sitting and listening, even though the material was interesting- it is still too much sitting and listening. Also you may need to ask more questions to ensure everyone is understanding.

4.2 Food Safety in The Fishery Sector

The course was assessed as providing lots of new ideas, a good balance of practical and theoretical knowledge, and would be very useful to the participants. Participants considered that it would allow them to perform very much better in their work. The pace of delivery was considered to be good and the resource person excellent, as were the logistical and communication arrangements. Comments suggested that the course would make a significant contribution to the job performance of the participants, especially in relation to improved inspection planning, with a greater focus on hazards and financial management. The participants would have preferred more practical training / field opportunities and greater variety in the resource persons. The detailed results are shown in Box 2a, b and c.

Box 2a: Evaluation results: Course on Food Safety in the Fishery Sector

Please answer the following questions by circling your score (choice) between 1 - 5 or write your comments in the allocated space. Please note that your answers will be treated confidentially.

1. Overall, how did you find the content of training workshop?

a) no new ideas	1	2	3	4	4.63	5	lots of new ideas
b) too theoretical	1	2	3	3.81	4	5	very practical

2. In respect of your professional work this training workshop was:

of no use	1	2	3	4	4.88	5	very useful

3. How much better will you be able to do your job as a result of this training workshop?

very little change	1	2	3	4	4.44	5	very much better

4. How did you find the pace of the training workshop?

too slow/quick	1	2	3	4	4.38	5	good pace

5. Overall, how did you find the quality of the resource person(s)

poor	1	2	3	4	4.75	5	excellent

6. How did you find the logistical arrangements (travel, accommodation, catering etc.)

poor	1	2	3	4	4.38	5	excellent

7. How did you find communication and sharing of information prior to the training course delivery?

poor	1	2	3	4	4.56	5	excellent

Box 2b: All responses received to the question "Please explain how this training will help you to improve your performance in your job, with examples"

To explain the systems that can be developed in food safety by other areas such as livestock health and plant health.

In designing a proper Food Safety Control System for Fish and Fishery Products.

Be better able to assist processing establishments develop and maintain a proper inspection and HACCP systems.

This training will assist me to improve my inspection skills in the performance of my job e.g. Water

Sampling and Temperature Test.

The training broadened my view of certain food safety issues such as ciguatera and histamines. The training also assisted me to understand breakeven / payback period to help the sector. A lot of policies are on the books but due to man power / finances the sector is limited.

There are many areas in my country where there are no controls e.g. imports, fishing vessels etc. The information received as well as discussions with other participants will help to develop systems for these controls in the future.

Have greater knowledge re official controls, aquaculture and greater network of professionals to access.

Enable me to articulate better to policy makers the requirements to implement SPS measures and responsibility.

Communicate SPS information to Fisheries Sector.

The knowledge, experience and training gained would assist me to better understand some areas of my work in fish and fishery inspection e.g. Traceability and how to handle toxins.

- Determination of the fish classification,
- Official controls,
- The role of the Competent Authority including national legislation
- Database for inspection results
- Financial Management
- Assessment of risk classification
- Results inspection – database with table of sanctions
- Financial management of official control functions
- Safety of water: correct relation between pH and HOCl
- Safety of water: correct relation between Total CL and free CL

I can now set up annual inspection plans for my department, develop breakdown points for labs and conduct water and pH testing.

It will help me on my inspections in considering the various hazards on Fish and Fishery Products and take a proper monitoring of ciguatera and histamines. Also to keep the residue monitoring for the EU certification.

This training has provided information on various hazards in fish and in aquaculture that can find its way to the consumer if not controlled.

Increase capacity to adopt new technologies and methods e.g. water testing to other colleagues. Implementation of these manuals into our system.

Box 2c: All responses received to the request "Please indicate how such courses as this could be improved in future"

Possibly utilise more resource personnel.

Show more examples of Stats of country which managed to reach EU regulations for export into the EU Community. A pattern of examples for us to learn.

Courses like these will be really relevant for inspectors in the area of food safety, controls and traceability procedure. For the future I believe that courses like this can be expended to one or two outdoor sessions. By visiting a fish processing plant or food processing institution for the purpose to observe certain good safety practices and procedures at this institution.

Such course can improve by doing field trips / off site hands on training. Also to develop an actual business plan in future training would be very useful, to be better able to [present this information to our supervisors.

More case studies and field trips.

Include site visit to establishments where such measures are implemented or to identify measures in practice to upgrade such institution.

1. Remove so many points on PowerPoint slides e.g. sessions 9 and 10 has as many as 12 points on one slide.
2. Provide fruits and small sandwiches for coffee break because often hungry before 1pm which became distracting.
3. Provide field trip / hands on opportunity to enhance course material. Sitting for 5 days straight in a classroom setting becomes tedious.
4. Place course dinner closer to beginning of course so it can serve as a mixer for participants.
5. Provide name cards for participants.
6. Vary teaching materials e.g. use videos, more lecturers. This course used one lecturer and only PowerPoint presentations.
7. Integrate information from PowerPoint into manuals. A lot of the information delivered by course presenter was not in the manuals.
8. Book flights that do not require so many connections / layovers. Book airlines of better reputation and history of performance.

Possibly having a short visit to an actual fish establishment.

The course was excellent.

The course was very useful and excellent.

Addition of practical exercises, visits to plants during operations, integrate different delivery materials for presentations.

The course was very informative and had very useful information for our countries. We need to continue and be more informed on updated issues on a regular basis.

I think the course should bring together a member of each of the key agencies from each country with mandate for fishing / vessel safety.

Have a mock inspection by visiting an establishment or practical.

Use cooperative learning more group assignments / teamwork.

5 CONCLUSIONS

Thirty participants from competent authorities and testing laboratories in 15 CARIFORUM countries, with responsibility for official controls with regard to fish and fishery products were trained in two courses delivered in St. Vincent and the Grenadines during the period 28 November to 09 December 2016, with a total of 70 hours of training inputs. The training was divided into two courses; Fishery Products Laboratory Testing and Food Safety in The Fishery Sector, with 15 attendees on each course.

The training was based around eight technical operational manuals prepared, setting out up-to-date information on the design of modern inspection, control and testing methods in line with the current requirements for international trade in fish and fishery products, with a significant emphasis on EU food safety conditions and hazards which are prevalent in Caribbean fishery products. Over the two weeks, the training was delivered by four resource persons. There was a strong focus on practical implementation of the content of the manuals and the content included practical sessions demonstrating modern rapid testing methods and case studies to illustrate key aspects of risk and financial management of the control and testing functions.

Overall, the courses were well received by the participants who indicated that in general they considered that the direct impact on their work would be high. The course arrangements and quality of the resource persons were considered to be good or excellent throughout. Participants suggested that, in future, such courses could be improved by combining content in relation to official control and laboratory functions, by extending the practical content of the course and having a greater variety of resource persons and learning methods.

The course content was recorded on video, and after editing and upload to the CRFM site, these materials would provide a useful and ongoing technical training resource for food safety competent authorities and testing laboratories in the Caribbean region.

Appendix 1: List of participants

Fishery Products Laboratory Testing Course: 28 November to 02 December 2016

	Name	Coming from	Job title
1	Laël Bertide-Josiah	Antigua and Barbuda	Scientific Officer, Department of Analytical Services
2	Avis Gweneth O'Reilly- Richardson	The Bahamas	Senior Chemist, Food Safety and Technology Laboratory
3	Cyrstal Merritt	Barbados	Laboratory Analyst
4	Jessica Hyde	Belize	Laboratory Technician, Food Safety Department
5	Jaceline Millar	Commonwealth of Dominica	Laboratory Technologist, Water Quality Laboratory, Environmental Health Department, Ministry of Health
6	Miriam Ortega	Dominica Republic	Laboratory Analyst, Veterinary Central Laboratory, Ministry of Agriculture
7	Erwin Henry	Grenada	Grenada Produce Chemist
8	Nakita Anita Dookie	Guyana	Fisheries Officer, Ministry of Agriculture Fisheries Department
9	Kerriel Thandile Green	Jamaica	Veterinary Services Division, Veterinary Services Diagnostic Laboratory
10	Jermine Mike	Saint Kitts and Nevis	Chemist / Standards Development Officer, St. Kitts and Nevis Bureau of Standards
11	Rosanna P. Sonson	Saint Lucia	Laboratory Manager, Gros Islet Polyclinic/Food and Water Laboratory
12	Cylena Andrews	St. Vincent and the Grenadines	Fisheries Officer – Quality Assurance
13	Alisa Martin	St. Vincent and the Grenadines	Fisheries Officer, Microbiologist/Testing Laboratory Quality Manager
14	Soenita Kariem-Janki	Suriname	Head of the Laboratory Fish Inspection Institute
15	Joanna Malsingh	Trinidad and Tobago	Chemist, Chemistry Food and Drugs Division, Minister of Health

Food Safety in The Fishery Sector Course; 05 December to 09 December 2016

	Name	**Country**	**Job title / Organisation**
1.	Ian S. Horsford	Antigua and Barbuda	Senior Fisheries Officer National Focal Point (WECAFC), Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs
2.	Katrina Woodside	The Bahamas	Assistant Fisheries Officer, Department of Marine Resources
3.	Sherlock King	Barbados	Manager of Markets
4.	Nestor Orlando Correa	Belize	Belize Agricultural Health Authority Food Safety Inspector
5	Jullan Defoe	Commonwealth of Dominica	Fisheries Officer, Ministry of Agriculture and Fisheries
6	Moran Mitchell	Grenada	Fisheries Officer II
7	Ozaye Warren Stephon	Guyana	Veterinary Public Health Officer

	Dodson		
8	Gavin Peters	Guyana	Animal Health Specialist, CAFHSA
9	Miskha Stennet	Jamaica	Senior Veterinary Officer. In charge of the Aquaculture and Marine Division of the Food Safety Unit.
10	Nikkita Browne	Saint Kitts	Oceanography and GIS Officer Inspect the quality of fishery products for export.
11	Ernie Wayne Pierre	Saint Lucia	Senior Environmental Health Officer, Ministry of Health Human Services, Family Affairs and Gender Relations
12	Marjory Soetini Kromotaroeno	Suriname	Senior Inspector of the Inspection department Fish Inspection Institute
13	Arisha Sewbaran-Sital	Suriname	Sub-Head of the Inspection department, Fish Inspection Institute
14	Guenette King	Saint Vincent and the Grenadines	Fisheries Assistant - Quality Assurance
15	Stella Harrygin	Trinidad and Tobago	Food and Drugs Inspector
16	Ferique Shortte	Saint Vincent and the Grenadines	Senior Fisheries Assistant
17	Carlina Laborde	Saint Vincent and the Grenadines	Fisheries Laboratory Assistant

Appendix 2: Course Curriculum: Fishery Products Laboratory Testing

Principal resource person	Dr. Christine Froese
Objectives	The objective of the course will be to: 1. Review testing methods and requirements for key fish safety parameters, as set out in training manuals developed under the project 2. Demonstrate modern rapid methods of analysis (chemical and microbiological) 3. Develop an awareness of laboratory quality management procedures and accreditation requirements (ISO17025) 4. Introduce Operational manuals prepared on behalf of IICA and CRFM: • Manual on Laboratory Testing of Fisheries Products • Manual for Laboratory Quality Assurance

Programme

Monday, 28 November 2016
Principal Trainer: Christine Froese, Megapesca Lda.

Time	Course Content	Comment
09.00-10.45	Welcome; official opening by IICA, SVG Ministry and CRFM Vote of thanks Introduction to the project Logistical and administrative arrangements Group photograph	
10.45-11.00	Coffee break	
11.00-12.00	Introduction of the training course, objectives, structure etc. Introduction of participants and trainers	Background to the course, aims and objectives Presentation of participants and summary of their current activities
12.00-13.00	Introduction to the two manuals and how to use the manual	This session will present the aims, objectives and content of each manual prepared by the project: • Manual on Laboratory Testing of Fisheries Products • Manual for Laboratory Quality Assurance It will set out how these documents can be used by designated laboratories for testing for official controls. The session will emphasise the importance of using standard approaches to sampling and test methods, and show how laboratory best practices for accuracy of test results for international trade. It will describe the EU approach to the management of official control laboratories
13.00-14.00	Lunch	

14.00 -15.30	Microbiological water testing	The session will address standard methods for testing water and ice safety and quality based on the requirements of the EU drinking water directive and by use of ISO standards. It also covers trends in water quality testing for human consumption and alternative methods. Specific methods will be described for testing for E. coli and coliform bacteria by use of chromogenic media and enumeration of culturable microorganisms, colony count at 22°C and 36°C and for testing for Clostridium perfringens. It will cover techniques of membrane filtration and enumeration including quality assurance and validation. It especially aims at introduction new ISO standards and tests by use of chromogenic media.
15.30-15.45	Health break	
15.45-17.00	Microbiological testing for fish, fishery products, sea shellfish and molluscs	The session will cover EU standard methods for microbiological testing for fish, fishery products, shellfish and molluscs covering typical hazards in the Caribbean region. It will cover the definition of microbiological criteria. The session will address sampling, sample preparation, procedure, technique/media, result expression, quality assurance and validation, and provide an overview on possible alternative methods. The session will describe examples of colony count at 30°C and for detection of salmonella in cooked crustaceans and molluscs shellfish and live bivalve molluscs, live echinoderms, tunicates and gastropods.

Tuesday, 29 November 2016
Trainers Christine Froese, Megapesca and Iñigo Hernandez, Biolan

Time	Course Content	Comment
9.30-10.00	Practical work: demonstration and experience of BIOFISH 300 (BIOLAN) histamine determination	This session will describe and demonstrate a fast, easy and reliable test for quantification of histamine in fish by an enzymatic biosensor (BIOFISH 300). The method can be used for determination of histamines in raw, canned, cooked and salted fish and in fish meal. The session will cover: 1. Explanation of the method's basis. 2. Calibration of the device
10.00-10.30	Coffee break	
10.30-13.00	Practical work: demonstration and group work of BIOFISH 300 (BIOLAN) histamine determination	Continuation of session on histamine analysis (using the example of canned fish). It will allow the participants to obtain hands-on experience of: 1. Sample preparation 2. Extraction and Measuring of the sample. The session will concluded with a discussion on the context

		for application of rapid histamine testing.
13.00-14.00	Lunch	
14.00-15.30	Histamine analysis in fish	The session will describe the EU official test method for histamine determination in certain fish species including sampling and sample preparation, reporting of results and validation.
15.30-15.45	Health break	
15.45-17.00	Chemical and toxin testing in fish and fishery products	The session will review the analytical methods for determination of some of the major chemical hazards - heavy metals (cadmium, lead and mercury), sulphur, marine biotoxins – which should be subject to control and testing in fish and fishery products from the Caribbean region with relevance for trade to EU. The session will cover the equipment required, sampling, sample preparation, and testing methods to be applied, as well as performance criteria, expression of results and quality assurance.

Wednesday, 30 November 2016
Trainers: Christine Froese, Megapesca and Cristina D´Aiutolo, BIOPHARM

Time	Course Content	Comment
9.00-10.30	Demonstration and group work of rapid test kits related to microbiological determination.	The session will introduce and demonstrate a range of rapid test methods, using the BIOPHARM test kits of rapid microbiology tests. Participants will experience their application to surfaces, water and fish using: • Rapid Swabbing methods using – RIDASTAMP TOTAL, RIDASTAMP SALMONELLA • Rapid detection of Pathogens – COMPACT DRY SALMONELLA
10.30-10.45	Coffee break	
10.45-13.00	Continuation of demonstration and group work on rapid microbiological test kits	The session will introduce and demonstrate a rapid test method for detection of bacteria in water. Participants will be trained in the use of the BIOPHARM COMPACT DRY TOTAL test kits.
13.00-14.00	Lunch	
14.00-15.45	Use of competitive enzyme immunoassay tests for the screening of samples for histamine	The session will introduce and demonstrate an alternative rapid test method for detection of histamine in fishery products. Participants will be trained in the detection of Histamine in fish –using the BIOPHARM RIDASCREEN HISTAMIN (enzymatic) test kit.
15.30-15.45	Health break	
15.45-17.00	Continuation of histamine screening tests	Practical group work on detection of Histamine in fish – RIDASCREEN HISTAMIN (enzymatic)

Thursday, 01 December 2016
Trainers: Christine Froese, Megapesca and Cristina D´Aiutolo, Biopharm

Time	Course Content	Comment
9.00-10.30	Use of rapid test kits for detection of antibiotics in fish and shrimps	The session will introduce and demonstrate a rapid test method for detection of antibiotics in fish and shrimps – BIOPHARM PREMITEST

10.30.10.45	Coffee break	
10.45-13.00	Continuation of use of rapid test kits for detection of antibiotics in fish and shrimps	Practical Groupwork Detection of antibiotics in fish and shrimps – BIOPHARM PREMITEST
13.00-14.00	Lunch	
14.00-15.30	Quality assurance in fish testing laboratories Part 1	The session will introduce the topic of laboratory quality assurance, considering the accuracy of test results in microbiological and chemical testing in fish and fishery products. It will outline the scope and the requirements set out in ISO / IEC 17025, with regard to accommodation and environmental conditions, facilities, personnel, equipment and maintenance, reagents and culture media, sampling and management requirements and other factors relevant for the competence of testing and accuracy of results.
15.30-15.45	Health break	
15.30-17.00	Quality assurance in fish testing laboratories Part 2	Continuation of the previous session. The session will consider detailed requirements for ensuring the accuracy of test results in fisheries labs, addressing test methods and validation, performance verification, reference materials, reporting of results and quality assurance.
19.00-22.00	Course dinner	

Friday, 02 December 2016
Trainers Christine Froese and Ian Goulding Megapesca

Time	Course Content	Comment
9.00-10.30 am	Business planning for laboratories	Introduction to business planning for laboratories addressing the costing of testing services, pricing, profit and loss, breakeven, SWOT analysis and preparing a business plan
10.30-10.45	Coffee break	
11.00 -13:00	Quality assurance in fishery laboratories Part 3 - accreditation	The session will address the specific requirements and steps towards accreditation of laboratories in line with ISO 17025 and requirements
13.00-14.00	Lunch	
14.00-15.30	Needs assessment of fisheries laboratories in the Caribbean region	This session will be an open discussion session on strategic development of laboratory testing services for food safety in the fishery sector, with special reference to the role of national and regional laboratories.
15.30-16.00	Health break	
16.00-16.30	Evaluation of the course	
16.30-17.00	Award of certificates and closing ceremony	

Appendix 3: Course Curriculum: Food Safety in The Fishery Sector

Principal resource person	Ian Goulding, Megapesca Lda.
Objectives	The objective of the course will be to: • Review inspection and official control methods and requirements for safety of fishery and aquaculture products, as set out in new operational manuals for sanitary controls developed by CRFM • Present and demonstrate modern approaches to inspection, sampling and official control of fishery and aquaculture products. • Develop an awareness of the role of laboratory testing in ensuring the safety of fishery products

PROGRAMME

Monday, 05 December 2016

Time	Title	Contents / Reference
09.00-09.45	1. Welcome and official opening 2. Introduction to the project 3. Logistical and administrative arrangements 4. Formal presentation of equipment to participants 5. Group photograph	Caribbean Regional Fisheries Mechanism Consultants
09.45-10.45	1. Introduction to the training course, objectives, structure 2. Introduction of participants and trainers 3. Introduction to and overview of the manuals prepared by the project	Background to the course, aims and objectives Presentation of participants and summary of their current activities Presentation of the aims and content of each manual, and set out how they can be used by fishery business operators and competent authorities: 1. Manual on Assuring Food Safety Conditions in Capture Fisheries, 2. Manual for the Inspection and Official Control of Caribbean Fishery Products 3. Manual on Assuring the Food Safety of Aquaculture Products 4. Guide to Food Safety Hazards in Caribbean Fishery Products 5. Manual on Assuring Food Safety Conditions in Fish Landing and Processing 6. Manual on Traceability Systems for Fish and Fishery Products
10.45-11.00	Coffee break	
11.00-13.00	1. Food safety, international trade and the fishery sector	The session will provide the international context for the development of sanitary controls in the fishery sector. It will address the role of the SPS Agreement

		and Codex Alimentarius Commission, and introduce participants the concepts of risk management and official control in the context of international standards.
13.00-14.00	Lunch	
14.00-15.30	2. Case study on the Codex standard for smoked fish	This case study will be a group exercise to identify the issues which should be taken into account in the setting of an international standard for the safety of a processed fishery product.
15.30-15.45	Health break	
15.45-17.00	3. Classification of hazards: review of chemical, biological and physical hazards	This session will address the scientific basis for the main food safety hazards encountered in fishery products within the region along with methods of elimination and control. It will characterise the most important chemical physical and microbiological hazards. Key hazards covered will be histamine, ciguatera, heavy metals, *Cl.botulinum* and other food poisoning bacteria. Reference: *Food Safety Hazards in fishery products (Manual No.4)*

Tuesday, 06 December 2016

Time	Title	Contents/Reference
9.00-10.00	4. Food safety conditions in fishing operations	This session will address the design structure and operation of fishing vessels in terms of ensuring the food safety of the catch. It will relate food safety conditions to the different species targeted and the fishing gears used, as well as dealing with the post-harvest handling conditions onboard to ensure that product safety and quality is maintained. There will be a special focus on the need to chill histamine producing species. *Assuring Food Safety Conditions in Capture Fisheries (Manual No.1)*
10.00-10.30	Coffee break	
10.30-13.00	5. Food safety conditions in landing and processing	This will address the design structure and operation of fish landing and processing operations, in terms of ensuring the food safety. It will deal with ensuring hygienic conditions, including personal hygiene and standard operating procedures such as pest control, cleaning and sanitising. The context for HACCP and traceability systems is also described, although these are dealt with elsewhere. *Assuring Food Safety Conditions in Fish Landing and Processing (Manual No.5)*
13.00-14.00	Lunch	
14.00-15.30	6. Safety of water	This will address water safety, with special reference to treatments to ensure microbiological safety. It will address the chemistry of chlorination, for potabilization and sanitising, as well as approaches to sampling and treatment of water. It will also review cleaning and sanitising methods. *Assuring Food Safety*

		Conditions in Fish Landing and Processing (Manual No.5)
15.30-15.45	Health break	
15.45-17.00	7. Practical session: (a) water safety and pH/Cl testing ; (b) use of thermometers	This is a practical session in which participants will undertake the: a) analysis of free and combined chlorine and pH in potable water using the Lovibond test kits. b) Review the use of thermometers and temperature logging tools in assessing safety of fishery products *Assuring Food Safety Conditions in Fish Landing and Processing (Manual No.5)*

Wednesday, 07 December 2016

Time	Title	Contents/Reference
9.00-10.30	8. Implementation of HACCP systems	This session will review the HACCP system, as a means of ensuring that food safety hazards are under control. It will present the 7 principles of HACCP, using examples from the fishery sector (specifically in relation to the histamine and ciguatera hazards). CRFM Guidelines on Developing and Implementing HACCP Plans for Fish and Fishery Products, September 2015
10.30-10.45	Coffee break	
10.45-13.00	9. Official controls 1.	This session will address organisation and management of Competent Authority functions, and address issues such as organisation structure, and ensuring the integrity of the control system. *Manual No.2: Inspection and Official Control*
13.00-14.00	Lunch	
14.00-15.45	10. Official controls 2	This session will consider, the role of the inspector, the role of checklists and scoring systems, the importance of setting out non-compliance procedures, certification and annual control plans and reports. *Manual No.2: Inspection and Official Control*
15.30-15.45	Lunch	
15.45-17.00	11. Risk based inspections	This session will look in detail at the approach to applying principles of risk management in the design and implementation of an inspection system. It will consider risk profiling of establishments based on severity and frequency of hazards, assessing compliance history and use of risk profile data in allocation of control resources. It will also review the organisation of border controls and consider how risk factors should be applied in the design of border inspection functions. *Manual No.2: Inspection and Official Control*

Thursday, 08 December 2016

Time	Title	Contents/Reference
9.00-10.30	12. Design and implementation of food safety monitoring; programmes	This session will consider the role of monitoring in assessing effectiveness of the control system. It will address the selection of monitoring parameters, sampling strategies and selection of testing methods (including screening). *Manual No.2: Inspection and Official Control*
10.30.10.45	Coffee break	
10.45-13.00	13. Financial management of official control functions	Financial management of the inspection system, the role and management of laboratory testing. Business planning for laboratory investments and the make or but decision. This will include a group exercise on laboratory financing *Manual No.2: Inspection and Official Control.*
13.00-14.00	Lunch	
14.00-15.30	14. Food safety hazards in aquaculture; veterinary medicines, aflatoxins	This session will consider the special food safety issues to be addressed in aquaculture, with particular reference to species produced within the region (shrimp and tilapia). Specific hazards (aflatoxins and veterinary medicines) will be described and control methods. *Manual No.3 Food safety hazards and controls in aquaculture*
15.30-15.45	Health break	
15.30-17.00	15. Food safety controls in aquaculture; monitoring requirements and inspection of aquaculture facilities	The need for residue monitoring programmes will be discussed, along with the design of sampling and testing protocols. Specific requirements for inspection and control of aquaculture establishments will be covered, and implications for HACCP plans and traceability. *Manual No.3 Food safety hazards and controls in aquaculture*
19.00-22.00	Course dinner	

Friday, 09 December 2016

Time	Title	Contents/Reference
9.00-10.30	16. Traceability systems for fishery and aquaculture products 1	Reasons for traceability (food safety, tariffs and IUU fishing requirements). Regulatory basis and voluntary certification; key features of traceability systems; internal and external traceability; batch separation and data recording. *Manual No.6: Traceability Systems for Fish and Fishery Products*
10.30-10.45	Coffee break	
11.00 -13:00	17. Traceability systems for fishery and aquaculture products 1	Implementation of product withdrawal and recall; inspection of traceability; international coding systems, crisis management; traceability tools and data logging systems (example of Timestrip system). *Manual No.6: Traceability Systems for Fish and Fishery Products*
13.00-14.00	Lunch	

14.00-15.30	18. How to regionalise functions related to inspection and control of fishery products: Open session: discussion on implementation of strengthened sanitary controls in the Caribbean fishery sector	The session will present case study on the design of the Pacific Regional Competent Authority Support Unit (RECAS). It will provide an opportunity for participants to discuss the ways to implement what they have learnt during the course and, in particular, to consider the potential for greater regional integration of control activities in the fishery sector.
15.30-16.00	Health break	
16.00-16.30	Evaluation of the course Completion of baseline questionnaire	
16.30-17.00	Presentation of equipment Award of certificates Closing ceremony	Caribbean Regional Fisheries Mechanism

ANNEX 6: REPORT ON ASSESSMENT OF IMPACTS OF MEASURES TO STRENGTHEN SPS CONDITIONS IN THE CARIBBEAN FISHERY SECTOR

REPORT ON ASSESSMENT OF IMPACTS OF MEASURES TO STRENGTHEN SPS CONDITIONS IN THE CARIBBEAN FISHERY SECTOR

under the project

Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade

Fish landings at Kingstown, St. Vincent and the Grenadines

CONTENTS

1 INTRODUCTION

This Report is submitted by Megapesca Lda of Portugal, a food and fisheries consultancy firm established in 1994.

The report describes the activities and results of an impact assessment study undertaken under the Project "*Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade"* implemented by the Inter-American Institute for Cooperation on Agriculture (IICA) under the EU funded project "10th EDF Sanitary and Phytosanitary Measures Project". The Caribbean Regional Fisheries Mechanism (CRFM), is nominated by IICA as responsible for the coordination of the technical implementation of the project. The project commenced on signature of the contract on 26th August 2016, and is expected to finish in January 2017.

2 DESCRIPTION OF THE INTERVENTION

2.1 Objective

The objective of the project, according to the ToR is:

To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

2.2 Project results

The project aims to:

- Develop at least 8 food safety operational manuals for field, laboratory, market and trade (import and export) to support the activities of designated persons and institutions responsible for the safety of fish and fish products
- Develop training programmes for improving official control and testing laboratory skills in SPS quality management of fish and fish products, (including the supply of relevant equipment)
- Deliver the training programmes in short courses in the region
- Design and implement Impact Assessment Tools
- Design relevant communication and visibility products

The expected result is that capacities will be built at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

2.3 Study on impact assessment

The terms of reference require the development of two impact assessment tools.

The first of these is to assess the immediate impact of the two training programmes implemented under the project. A separate training evaluation tool, to allow an assessment of the relevance, effectiveness, level and quality of delivery of training activities undertaken by the project, was therefore developed and applied by the consultants at the end of the training courses. The design and results of this questionnaire evaluation are described in a separate "Report on Training Workshops and Equipment Delivered" submitted to the CRFM on the 22 December 2012.

The activities and findings described in this report concern the design and implementation of a second impact assessment tool, for the use of the CRFM and IICA to evaluate the impact of the training programmes and manuals on changes in knowledge, attitudes and practices as a result of the consultancy, and which may reasonably be expected to occur over a 1 or 2 year period. The activities described also concern the establishment of baseline indicators for longer term monitoring of the development of the sanitary control system for fishery and aquaculture products in the CARIFORUM region.

3 ACTIVITIES UNDERTAKEN

3.1 Data sources for impact assessment

3.1.1 Overview

The consultants acquired data regarding the sanitary control system of the CARIFORUM region from three main sources:

- National and regional level publicly available data concerning national fishery sector and related sanitary controls
- Questionnaire survey of professional participants in training courses delivered under the project, to obtain factual data concerning:
  - Capacities of official controls for fishery products
  - Testing Laboratories capacities
- Questionnaire survey of knowledge and attitudes of representatives from Competent Authorities within the region

3.1.2 National and regional level publicly available data

The consultants obtained the following data from the sources indicated:

Data	Source
List of Countries permitted to supply the EU with fishery products and bivalve molluscs and similar products (gastropod molluscs)	Commission Decision 2006/766/EC of 6 November 2006 establishing the lists of third countries and territories from which imports of bivalve molluscs, echinoderms, tunicates, marine gastropods and fishery products are permitted (as amended)
List of Countries permitted to supply the EU with aquaculture products	Commission Decision of 16 March 2011 on the approval of plans submitted by third countries in accordance with Article 29 of Council Directive 96/23/EC (as amended)
No. of countries with clearly nominated competent authorities responsible for sanitary controls for fishery products exported to the EU	European Commission DG SANTÉ Audit reports http://ec.europa.eu/food/audits-analysis/audit_reports/index.cfm
No. of freezer and factory vessels, processing establishments approved for export to the EU	Third Country Establishments -List per Country https://webgate.ec.europa.eu/sanco/traces/output/non_eu_listsPerCountry_en.htm
National and Regional Fish exports and imports to the EU	EUROSTAT Traditional international trade database access (ComExt) http://ec.europa.eu/eurostat
National and Regional Fish exports and imports (regional and global)	ITC TradeMap http://www.trademap.org/Index.aspx

3.1.3 Questionnaire survey of capacities of official sanitary controls and laboratory testing of fishery products

Detailed technical data was collected regarding sanitary controls and laboratory testing capacities via an email questionnaire distributed to the participants of the two training courses "Laboratory testing of fishery products" and "Food Safety in the Fishery Sector". These were held in St. Vincent and the Grenadines during the period 28 November to 9 December 2016. The main information requested was regarding key features of the official control systems and testing laboratories as follows:

The following data was requested in a questionnaire sent to each participant from Competent Authorities represented in the training course "Food Safety in the Fishery Sector":

- Profile of fishery sector (fleet, catches, processing establishments, aquaculture trade and employment)
- Staff resources (number / qualifications / level / subject)
- Qualifications of staff (level / subject)
- Dimensions of activity (number of inspections of vessels / establishments / aquaculture)
- Main food safety risks of concern

The following data was requested in a questionnaire sent to each participant from the testing laboratories represented in the training course "Laboratory testing of fishery products":

- Identification of laboratories
- Test parameters offered and methods (official / rapid)
- Accreditation and scope of accreditation
- Laboratory staff resources (number / qualifications / level / subject)

The content of the questionnaires is shown in Appendices 1 and 2 respectively and was approved by the CRFM in the inception report. The consultants received responses from 10 out of 13 Competent Authorities and 12 out of 13 testing laboratories.

3.1.4 Survey of Competent Authority knowledge, attitude and practices

A further set of questions was put to participants during the training course "Food Safety in the Fishery Sector", to assess the views of the Competent Authority professional staff regarding the knowledge, attitudes and practices concerning the control systems which they deliver. The approach applies a scaling technique to express the extent of agreement or disagreement with various statements.

These questions were based in part on the FAO/WHO Food Control Assessment Tool (November 2015 version) and on-line platform for information sharing on food safety control systems[1]. A copy is shown in Appendix 3. The approach was described in the Interim progress Report submitted by the consultants in November 2016 and approved by the CRFM.

[1] See FAO/WHO COORDINATING COMMITTEE FOR LATIN AMERICA AND THE CARIBBEAN, Twentieth Session, Viña del Mar, Chile, 21-25 November 2016, FOOD SAFETY AND QUALITY SITUATION IN THE COUNTRIES OF THE REGION, Trends in Food Safety and Quality issues in countries of the LAC region http://www.fao.org/fao-who-codexalimentarius/meetings-reports/detail/en/?meeting=CCLAC&session=20

4 RESULTS

4.1 Indicators of status of official sanitary controls of fishery products

The indicators at regional (CARIFORUM) level for the operation of a fishery and aquaculture sector sanitary control systems are shown in Table 1. A detailed country by country breakdown is shown in Appendix 3.

Table 1: Caribbean sanitary controls: Regional indicators of status (December 2016)

Indicator	Value
% countries with access to the EU market for fishery products (= 7/15)	47%
No. of countries with CAs nominated for fishery products (=10/15)	67%
No. of countries authorised to supply the EU with:	
• fishery products = 7/15	47%
• aquaculture products = 3/15	20%
• live bivalve Molluscs etc. (e.g. conch) = 1/15	7%
Number of approved processing establishments + Cold stores	54
Number of approved freezer vessels + factory vessels	28
Number accredited laboratories	2
Number of food safety tests within accreditation scope	9
Fish Export Value (total include live fish) = US$m	378.5
Fish Export Value (EU include live fish) = US$m	66.5
% of fish exports to EU market	18%
Regional Fish Imports Total US$	391.9
Regional balance of trade fishery products US$m	-15.4

4.2 Questionnaire survey of status of official sanitary controls of fishery products

Ten responses were received from the 13 Competent Authorities represented by the participants in the training course. These were as follows:

1. Antigua and Barbuda
2. Bahamas
3. Belize
4. Grenada
5. Guyana
6. Jamaica
7. St. Kitts and Nevis*
8. Suriname
9. St. Lucia*
10. St. Vincent*

The overall dimensions of the Caribbean fishery sector operations in these countries over which are applied sanitary controls are shown in Table 2. Three of the countries (indicated with an asterisk in the list) were not authorised to supply fishery products to the EU. The small-scale fishing sector presented a significant control challenge in all countries with 3,673 vessels recorded. In just 3 countries was there a

fleet of larger vessels, with a total of 407 semi-industrial and 115 industrial vessels (long liners and trawlers, 72 with freezing capacity). Six countries had aquaculture activities, with a total of 113 farms.

Seven of the CAs responding issued export certificates in 2015, with a total of 1,222 consignments entering international trade, of which 344 were to the EU from the seven authorised countries responding.

Table 2: Dimensions of sanitary control challenge in 10 Caribbean countries, December 2015

Indicator	Total No.
No. small scale vessels (<1 day fishing trip):	3,673
No. of semi-industrial vessels (fresh fish > 1 day fishing trip)	407
No of industrial vessels:	115
• Line / Longliners	28
• Trawlers	87
• Seiners	0
Number freezer / factory vessels:	72
Total: Number establishments (including cold stores)	192
EU approved: Number establishments (including cold stores)	98
Number of aquaculture farms:	113
Number of export consignments / certificates issues in 2015 EU	344
Number of export consignments / certificates issues in 2015 Other markets	878
Total number of certificates issued	1,222

In all countries except one, the scope of the controls exercised by the Competent Authority included both imports and exports. In three of the ten countries, however, the CA responsible for food safety of exports did not also exercise sanitary controls on fishery products for domestic consumption (see Table 3).

Table 3: Scope of responsibilities / activity in relation to food safety of fishery products

Scope of control system	Yes	No
Import control /certification	9	1
Export control / certification		
• EU only	7	3
• All destinations	10	0
Domestic market controls	7	3

With regard to laboratory resources, nine of the 10 had internal laboratory testing capacity within the Competent Authority, but all also used external laboratories for some testing. In most cases (nine out of 10) they sent samples to both national and overseas laboratories (see Table 4).

Table 4: Laboratory resources available to Competent Authorities

Laboratory used by the Competent Authority	Yes	No
• Internal Laboratory	9	1
• External laboratory:		
○ National	9	1
○ International	9	1

In terms of the range of tests applied, Table 5 shows that the average number of parameters tested by a CARIFORUM Competent Authority responsible for fishery product safety was 4.3, although one CA undertook a significantly higher level of testing across the board. One CA did not undertake any testing at all.

While only two of the CAs own laboratories were accredited to the ISO17025 standard (see section 4.4), external accredited laboratories were also contracted (by five countries CAs in the case of chemical parameters, and by 7 countries in the case of microbiological tests). As a result, across the 10 CARIFORUM Competent Authorities responding, accredited tests were employed on average for 2.3 chemical and 2.3 microbiological parameters.

Table 5: No. of parameters and reliability of tests undertaken

Range of tests applied	Min	Max	Mean
Number of food safety parameters tested:			
• Chemical	0	17	4.3
• Microbiological	0	14	3.5
Number of parameters tested within scope of accreditation			
• Chemical	0	11	2.3
• Microbiological	0	14	2.3

In terms of the staff resources applied by Caribbean CAs to sanitary controls of fishery products, in the 10 countries there were 146 staff engaged, out of which there were 122 technical staff engaged in sanitary inspections (Table 6), suggesting 24 managerial / administrative positions. The average number of technical staff was 12.2 per country. The number ranged from 2 in the smallest to 28 in the largest country, commensurate with the dimensions of the sector. There were 66 staff with degree level qualification and 70 staff with technical and vocational qualifications. Only 10 had secondary level education.

Table 6: Staff resources of the Competent Authority, 2015

	Min	Max	Mean	No.
Number of technical staff engaged in sanitary inspections	2	28	12.2	122
Number with highest qualifications at:				
• Secondary level	0	4	1	10
• Technical / vocation qualification	0	28	7	70
• University level including post-graduate	1	15	6.6	66

Overall the 10 CAs responding to the survey performed 2,347 inspections during 2015, an average of 235 each. However, four performed no inspections of vessels at all, and one performed no inspections of establishments, suggesting some serious gaps in the extent of the control system. Only 13 inspections were performed during 2015 on the 113 aquaculture establishments in the region.

Table 7: Numbers of fishery sector inspections by CARIFORUM Competent Authorities, 2015

Object of food inspection	**Min**	**Max**	**Mean**	**No.**
• Vessels	0	500	81.4	814
• establishments	0	584	151.9	1,519
• aquaculture	0	13	1.4	14
Total			**234.7**	**2347**

None of the Competent Authorities were able to indicate the number of confirmed non-compliances detected in 2015. One CA estimated that the annual incident rate of Scombroid and Ciguatera fish poisoning was about 30 per 10,000. Some of the matters of concern listed were:

- Inadequate / no sanitization of equipment and utensils.
- Absences of health certificates
- Problems associated with pest control

- Unavailability of hot water at food establishments
- *E.coli* and *Listeria, Vibrio parahaemolyticus, Salmonella*
- Temperature abuse and cross-contamination
- Complaints by consumers about spoilt fish from the local market

4.3 Self-assessment survey of current conditions and gaps of fishery sector sanitary controls

Competent Authority capacities were also evaluated by asking the participants from relevant Competent Authorities to complete some attitudinal questions regarding the capacities of their organisation. Fifteen responses were obtained. The structure of the questions and the results are summarised in the following table (Table 8).

Table 8: Structure and results of self-assessment questions regarding status of Competent Authority capacities

Questions	**Answering Options (% indicating that they….)**				
	Strongly Agree	**Agree**	**Don't Know**	**Disagree**	**Strongly Disagree**
Policy and legal framework	%	%	%	%	%
Our current legislation is up to date and in line with international standards such as Codex Alimentarius.	20	27	13	33	7
Our legislation provides a clear allocation of responsibilities for food safety risk management for both exports and domestic markets, without overlaps or gaps.	7	50	0	36	7
Government has in place a system for ensuring that sanitary controls in our sector are subject to a periodic review.	21	43	7	21	7
Our Competent Authority has applied sanctions against non-compliant operators during the last year.	29	21	21	21	7
Infrastructure and finances	%	%	%	%	%
Adequate budgets are provided by the Government for operational expenses of our competent authority (inspections, sampling and testing)	0	19	6	69	6
Our control activities and resources are applied at appropriate times and places, whenever and wherever food sector activities take place	6	81	0	13	0
Our inspectors have sufficient equipment (including transport) to perform their job effectively.	0	27	0	67	7
Adequate laboratory testing facilities are available (in terms of scope and capacity of testing) to meet all the needs of the food safety system.	7	33	0	40	20

Questions	Answering Options (% indicating that they….)				
	Strongly Agree	**Agree**	**Don't Know**	**Disagree**	**Strongly Disagree**
In case of a food safety emergency, food control laboratories have the capabilities and versatility to adapt to the resulting changes / surges in demand of tests to be performed	13	27	0	40	20
Human resources	%	%	%	%	%
Adequate number of competent staff is employed and receiving regular training to ensure the delivery of functions required for national food control.	18	29	6	47	0
Implementation of core control activities	%	%	%	%	%
A central mechanism for implementation of controls is defined and documented (i.e. SOPs, manual, TOR, etc.) and includes all relevant Competent Authorities	13	44	19	25	0
Our Competent Authority produces and publishes an annual control plan, setting out control targets	13	31	19	38	0
Our Competent Authority produces and publishes and annual report setting out the food safety status of the sectors under control	0	29	21	50	0
Our competent authority implements a periodic monitoring (sampling and testing) which indicates where food safety hazards within the mandate of my competent authority are under not under official control.	14	57	14	14	0
Implementation of specific functions	%	%	%	%	%
Our Competent Authority has designed a coherent risk based programme for control measures, taking into account relevant information (i.e. on product type, country of origin and importer's history)	18	53	18	6	6
Our inspection and official control activities are subject to a periodic formal audit to ensure that performance levels meet specific targets.	18	47	6	29	0
Our food safety system can identify occurrences of food borne disease reported by patients to their doctor.	0	33	27	40	0
Our Competent Authority has a written crisis management plan which is routinely tested to establish its efficacy.	0	7	40	53	0
Domestic stakeholders	%	%	%	%	%

Questions	Answering Options (% indicating that they….)				
	Strongly Agree	**Agree**	**Don't Know**	**Disagree**	**Strongly Disagree**
High risk categories of Food Business Operators (FBOs) are defined and receive additional focus of official control resources	13	60	20	7	0
International stakeholders	%	%	%	%	%
We maintain a database of contacts with named individuals in Competent Authorities in countries with which we trade (both import and export)	6	63	6	25	0
An INFOSAN Emergency Contact Point is designated and registered on the INFOSAN Community Website.	6	6	81	6	0
Evidence / risk base	%	%	%	%	%
Inspectors in our Competent Authority are concerned that not all of the important food safety hazards are under official control	13	69	0	19	0
Data from routine monitoring and surveillance are utilized for informing new risk analysis activities or for the review of former risk analysis activities.	13	63	19	6	0
Food safety measures applied by our Competent Authority are based on a quantifiable assessment of food safety risks	13	81	0	6	0

One notable feature of the responses is the small but significant numbers of "don't knows" ranging from 0 to 80% (this latter figure in the case of participation in the WHO INFOSAN network). This may reflect the fact that not all the respondents had CA management responsibilities; some were more junior inspectors who may not have been aware of, for example the policy and legal framework underpinning the work that they undertake.

Regarding the policy and legal framework, less than half (47%) of persons representing CAs considered that the legal framework was sufficiently up to date, and only 57% considered that that there was sufficient clarity in the allocation of risk management responsibilities and mandates between institutions. Periodic review of the policy and legal framework was undertaken by the majority of Governments (64%) but only half of the CAs had taken sanctions against non-compliant operators during the last year (suggesting either fully compliant sector or ineffective CA functions).

Eighty percent of the participants considered that their operational functions were insufficiently financed in terms of the implementation of controls. Despite this there was a substantial agreement (87%) that the control was applied at appropriate times and places. Seventy four percent considered that inspectors did not have sufficient equipment (including transport) and sixty percent considered that food testing laboratory services were insufficient in terms of scope and capacity of testing (including capacity to respond to food safety emergencies).

Regarding adequacy of the human resources employed, opinions were divided equally, with about half of the respondents considering that appropriate numbers of trained staff were available. Most agreed that

authorities had some degree of documented control system, although only 13% strongly agreed that this was in place, with a similar number indicating that an annual plan were published by the Competent Authority. Not one respondent strongly agreed that their CA published an annual report on their activities. However, some 71% operated a monitoring system to a degree (15% strongly agree, and 57% agree).

Some 30% of authorities had no external audit, and 40% of the authorities did not have any system to identify occurrences of food borne diseases reported to the medical practitioners and 53% did not have any form of crisis management plan. Only 7% applied risk profiling as a means of focusing official control resources. About a quarter did not have a database of contacts with external CAs and some 20% were concerned that not all important food safety hazards were under control. It appears that most authorities (86 to 94%) used risk based data to a degree (including from monitoring programmes) as the basis for the design of control activities.

4.4 Questionnaire survey of status of laboratory testing for official sanitary controls of fishery products

4.4.1 Activities undertaken

Twelve responses were received from the 13 Competent Authorities represented by the participants in the training course. All respondents were from public laboratories. All of them are reportedly official designated labs. However, they fall under a range of different ministries and undertaken different food testing activities, and at stages in the fish value chain, as follows:

1. Saint Lucia, Gros Islet Polyclinic Laboratory; official designated by the Ministry of Health. It works in food and water microbiology and has limited capacities (two rooms, two staff members). They test general food safety parameters. They are not testing for fish and fishery products at all.
2. Suriname, Stichting Viskeuringsinstituut (Fish Inspection Institute; VKI); this is the official designated laboratory for microbiological and chemical testing for fish and fishery products and water (processing water from the facilities) for export to EU. The VKI (Fish Inspection Institute) is also the Competent Authority for fish and fishery products. Test scope: Organoleptic, food microbiology, bacteriology, food quality, chemistry and water microbiology. Some tests are subcontracted outside Suriname.
3. Dominican Republic, Laboratorio Veterinario Central (Lavecen), official designated lab for Animal Illness Diagnosis, Food Quality & Feed Analysis Control for Ministry Of Agriculture, Ministry Of Public Health. It tests in various areas, such as food and water microbiology, pathogens, toxins, veterinary testing, food quality, chemistry, environmental testing (air, soil), GMO / biotechnology, water chemistry, feed analysis, veterinary drugs residues analysis, diagnostic zoonotic diseases, pesticides residue analysis.
4. Jamaica, Veterinary Services Diagnostic Laboratory, official designated laboratory for meat, poultry, fishery and milk products and by-products and water, major foodborne pathogens (except virus), residue & bio-contaminants including marine biotoxins under the Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF).
5. Trinidad and Tobago, Food Chemistry Laboratory. Chemistry Food and Drugs Division of the Ministry of Health, responsible for testing of packaged food products and pharmaceuticals (7 laboratories). The Food Chemistry Laboratory conducts chemical testing of a wide range of packaged food products including meat and fish. For fishery products, they test for histamine, total volatile basic nitrogen, pesticides and heavy metals. Their tests are currently done by CARIRI due to reconstruction activities of their building.
6. Belize, Central Investigation Laboratory, official designated lab of the Belize Agricultural Health Authority for microbiology analysis in fish and fishery products, food and water and chemical analysis in water, soil, feed and grains, aggregates, milk, dried foods, vegetables and crustaceans, Ministry of Agriculture, Forestry, Fisheries, the Environment, Sustainable Development and

Immigration. They test in areas: Food and water microbiology, pathogens, bacteriology, pesticides residues, environmental, water chemistry and feed

7. Saint Kitts and Nevis, Bureau of Standards / Multi-Purpose Laboratory, official controls lab for microbiological tests in food, water and chemical tests in food, water, soil, plants under the Government of Saint Kitts and Nevis Ministry of Trade et al. They test in areas of food and water microbiology, food quality, chemistry, pesticides, food safety, toxins, feed and water chemistry.
8. Dominica, Environmental Health Laboratory, official control lab for water and foods (of public health concern) under the Ministry of Health. Test areas are: Food and water microbiology (pathogens), water chemistry and food quality / chemistry.
9. Grenada, Grenada Produce Chemist Laboratory; competent authority laboratory under the Ministry of Health. Test areas are: Food safety - residues and contaminants, food and water microbiology, pathogens, toxins, food quality, chemistry, water chemistry, feed analysis and pesticides residue analysis.
10. Saint Vincent and the Grenadines, Fisheries Division Laboratory, Ministry of Agriculture, Forestry, Fisheries and Rural Transformation; undertaking testing for water (basic chemical tests) and in fish for histamine; Environmental samples:
11. Barbados, Government Analytical Services, official control lab for microbiological testing of food; chemical testing of food and quality testing under the Ministry of Agriculture, Food, Fisheries and Water Resource Management. Test areas are food and water microbiology, food quality / chemistry, pesticides, food safety, feed, water chemistry, environmental testing and testing of soil and plant tissue
12. The Bahamas, Food Safety and Technology Laboratories of the Department of Marine Resources responsible for testing microbiological and chemical in seafood, Ministry of Agriculture and Marine Resources. It also tests in the areas of Food and water microbiology, bacteriology and pathogens, Food quality, chemistry and nutritional labelling.

It is evident that not all of the laboratories test both microbiological and chemical parameters (some test only chemical and some only microbiological). One lab does not test for fish at all (Saint Lucia) and some labs test only for certain parameters and at certain stages in the food chain. Two labs did not respond to the question regarding their involvement in fishery product testing. Not all test samples are drawn from farm to fork, some only test final and packed processed food.

Activities in relation to food safety of fishery products

Five out of 12 labs are involved in testing for export control of fish and fishery products to the EU, such as: Suriname, Belize, Grenada, Jamaica, and The Bahamas. Most of the laboratories are involved in monitoring programmes and technical support to industry (Table 9).

Table 9: No. of laboratories undertaking different functions

Activity	No. of labs involved
Import control	7
Export control national	6
Export control EU	5
Monitoring programmes	9
Routine surveillance	7
Technical support to industry	8
Certification	4

Use of external labs

There is an extensive use of external services, as shown in Table 10. Seven out of 12 labs use external labs for some of their testing services, some of them both national and international.

Table 10: Use of external laboratory services by seven Caribbean Countries

Country	Location of external laboratory	Parameters	Comment
Belize	US (Louisiana): Trinidad and Tobago: Guatemala:	Antibiotics, heavy metals, total malachite green, pesticides and PCBs, aflatoxins, nutritional analysis Salmonella spp and Vibro spp for confirmation Nutritional analysis	
Jamaica	National University of the West Indies (UWI) UWI-Pharmacology Bureau of Standards ICENS National Public Health Lab	Pesticides Lipophilic Toxins Trace Elements Mercury Vibrio	Instrument down time Lack of capacity in-house Not all elements done Instrument down time
	International Vigo, Spain NVSL, Ames, IOWA	Marine Biotoxins Microbiological / Virus	National Reference Laboratory in Europe Class 3 lab setting
Suriname	National: Central Laboratory of Ministry of Public of Health (BOG), Suriname	Water: Chemical testing	In 2017 VKI will test chemical test of water
	International SGS Laboratory Services Netherlands	Fish, Fishery Products: Heavy metals (Pb, Cd, Hg), Arsene, PCB & dioxine Dried Fish and Fishery Products: Benzo(a) pyrene, (PAH'S) Aquaculture fishery products, Water and Feed: Residues	In 2017 VKI will test for heavy metals, arsenic themselves For analysis of PCB and dioxin (1 sample / year), Benzo(a) pyrene (10 samples / year) and residues (91 sample / year) we don't get so much samples to analyze. Too high costs to do this analysis themselves.
Saint Lucia	CARPHA Trinidad and Tobago	E.g. Salmonella serotyping. Any other pathogens we are unable to culture / identify	Reference laboratory
Saint Kitts and Nevis	US, Miami: Yeast and mould for identification		

Saint Vincent and the Grenadines	National Bureau of Standards	E.coli & Intestinal Enterococci	Lack of materials, supplies and equipment
	International CARIRI	Histamine, E.coli, Intestinal Entercocci, Lead, Cadmium, Mercury, APC	Test done by an accredited lab
Dominican Republic	National Laboratorio Nacional Doctor Defillo	Mycobacterium tuberculosis Drugs Sensitivity	We Do Not Have The Required Drugs To Perform That Analysis.
	International Iowa (Ames)	Detection Of Mycobacteria By PCR	We Do Not Have Available Equipment

The frequency, amounts of tests contracted out using external labs was not evaluated. Not all of the labs are involved in export control of fish (for example in Saint Vincent and the Grenadines, Saint Kitts and Nevis, and St. Lucia).

Main products tested

Not all laboratories are dedicated fish testing laboratories; several are engaged in a wider range of food product testing (Table 11).

Table 11: Main products tested

Country lab	Main products tested
Barbados, Dominica	No information provided
Bahamas	Crawfish (lobster) tails, stone crab claws, conch, scale fish
SVG	Can be done: Water: pH, conductivity, turbidity, free & total chlorine Fish: Histamine Environmental samples: APC
Grenada	Bottled Water, Fish, Agro- Processed Food Products, Water
Saint Kitts	Food: Salmonella, Listeria, E.coli, Staph. aureus, Yeast and mould, total coliforms, faecal coliforms Water: Cations (lead, sodium, manganese, tin, etc.), anions (phosphates, nitrates, sulfates, etc.), microbial (total coliforms, faecal coliforms, E.coli, total aerobic plate count)
Belize	Microbiological: Processed Seafood – Total coliform, Faecal coliform, E. coli, Staphylococcus aureus, Vibrio species and EAPC Pond Shrimp – Vibrio species Water – Total coliform, Faecal coliform, E. coli, HPC Ice - Total coliform, Faecal coliform, E. coli, HPC Chemical: Crustaceans – Sulphites Water- Total nitrogen, total phosphorus Aggregates – Chloride and sulphate
Trinidad and Tobago	Wide range of packaged products, such as Beverages, Cereals and Starch products, Confectionary, Dairy Products, Flavourings, Fruits, Vegetables and Root Crops, Syrups, Fruit Ices, Jams, Jellies, Meat and Fish, Fats and Oils, Seasonings and Sauces, Water, Salt, Vinegar
Jamaica	Fishery Products - Crustaceans (lobster, shrimp), Marine Gastropods (Conch)

	and finfish Fishery Products Marine biotoxins – Conch Meat Products – bovine, caprine,porcine Poultry – poultry meat & eggs Dairy – milk and cheese Water – ice, potable, non-potable & seawater
Dominican Republic	Veterinary drugs residues on fish, Heavy metals on water and fish, pesticide residues on vegetables, water microbiology, food microbiology, Toxins on fish.
Suriname	Work surfaces in Facility -Monitoring Hygiene with Contact E plates Fish and Fishery Products Salmonella Water Aerobic Plate Count at 22°C Water Aerobic Plate Count at 36°C Water Total coliforms Water Escherichia coli Water Enterococci Surface water Clostridium perfringens and spores Fish and Fishery Products Organoleptic Testing Fish and Fishery Products Refractive index of Fish-eye-fluid Fish and Fishery Products pH measurement Fish and Fishery Products TVB-N Fish and Fishery Products Boiling test with microwave oven Fish and Fishery Products Histamine with HPLC
Saint Lucia	Water, Juices, Deli meats, Cooked foods. Raw meats

Testing for official controls for exports to EU

Three of the labs undertake testing for official control for fishery products exported to the EU (Belize, Suriname and Jamaica). In these cases, specific monitoring is performed, in relation to:

- Jamaica: 3 Marine Biotoxins - EU Reference method; E.coli: ISO 16649-3; Salmonella: ISO 6579
- Suriname; Fish and FP: Histamine, Salmonella, organoleptic, pH, refractive measurement of fish-eye fluid, TVB-N, Water: APC 22°C and 36°C, total coliforms, Escherichia coli, Enterococci, Clostridium perfringens and spores (surface water); hygiene monitoring of processing plants
- Belize: Bi-sulphites in Crustaceans (AOAC 990.28)

Major sources of funding

Four respondents did not answer a question regarding the different sources of funding. Of those that did, for capital investment, three indicated that donors were a major source, two from the state budget and 5 from other government funds. For operating expenses, the government budget was indicated as the main source by five laboratories. However, three also indicated that they also received finance from donors.

Turnaround time for tests

Four labs indicated an average turnaround time of results of 14 days. Six labs were able to deliver results in a shorter time, and one reported a longer time (up to 21 days).

4.4.2 Human resource

Most of the labs have a staff of less than 10 (including technicians, analysts and administration staff). Some of the public labs are testing in general food safety and quality as well as fishery products, therefore the total cannot be taken as indicative of the technical resource applied to fishery products. This is estimated to be somewhat less, (in the region of 54 in the main countries exporting fish and fishery products to the EU – see Table 12).

Table 12: No. of staff employed in food safety testing laboratories.

Staff number	No of labs	EU export testing labs (no of staff)
< 5	4	Belize (4)
6-10	5	Suriname (10); Grenada (7)
11-15	1	Bahamas (14)
16-25	2	Jamaica (16)
>25	1	

Four out of 12 labs were reported to have a dedicated budget for staff training (Jamaica, Suriname, Trinidad and Tobago and Saint Vincent and the Grenadines).

4.4.3 Instruments and equipment

Table 13 shows that there is a wide range of equipment available, but that not all laboratories are fully equipped for a full range of tests. There appears to be an emphasis on microbiological testing, although it is noted that many laboratories only have one autoclave (and miss a separate one for sterilising used culture plates).

Only 2 LC-MS and 1 GC MS systems are available in the region. These are required for analysis of low concentrations of organic environmental contaminants (e.g. pesticides) and veterinary medicines. Importantly some 17% of the equipment appears to be out of order and approximately 50% of the gas chromatography systems and AAS (for analysis of heavy metals) are out of order, even though eight of the 12 twelve laboratories reported having established arrangements for service and maintenance.

Table 13: Provision and operational status of analytical equipment

Instruments	No. present in all laboratories	No. out of order
Biosafety Cabinet*	11	1
Autoclave clean*	15	2
Autoclaves dirty	6	
GC+	7	3
GC-MS	1	1
AAS	7	3
ICP	1	1
HPLC*+	5	1
LC-MS	2	
Mercury analyser	1	
Deep freezer – 20°C	12	1
ELISA*	13	1
Spectrophotometer	2	
Ion chromatograph	1	
	84	14

* Some of the labs have more than one of the equipment; + Some of the labs have more than one detection system

Most of them have a biosafety cabinet and -20°C freezers.

4.4.4 Tests performed

It is important for the validity of test results that standardised sample preparation and testing methods are applied by laboratories. Laboratories should therefore be able to reference their methods to external standards. This is particularly important where an export market Competent Authority has established the required test methods in its regulations. This is the case, for example, with histamine testing for fishery

products consigned to the EU market. In terms of the testing methods applied, three laboratories were unable to provide information, and four did not specify the matrices tested. Table 14 shows the external methodological references of the testing methods used for different parameters in 9 laboratories.

Table 14: Methodologies applied in food safety testing of fishery products

Parameter	**Matrix**	**Method**
Histamines	Fish	HPLC HPLC in-house ELISA
TVB-N		EU Regulation National standards
Heavy metals		
Toxins		
Chemistry	Water Serval parameters	AOAC SM,AOAC, HACH 1
Sulphites	Seafood	AOAC 990.28 2
Vibrio	Seafood	FDA/BAM; AOAC 2
TPC	Food 1 Swabs	FDA, BAM 2 Scientific literature 1 In house (food)
Enterobacteria, coliforms, E.coli	Swabs, surface	In house 1
Salmonella food	Fish/Food	AOAC/BAM 2 MFHPB 1 ISO 6579:2002 1 FDA, BAM 2001 2 ISO
Salmonella	Water	MFHPB 1
E.coli, coliform, clostridium & spores, enterococci	Water	ISO
Faecal strep	Water	Standard method
Faecal	Food & water Water	AOAC 989.10 1 Standard method APHA
Coliforms	Fish Food	GDBS 1 ISO 9308 BAM, FDA 2001 Standard method APHA
E.coli E.coli & coliforms	Fish1 Food	AOAC/BAM 1 AOAC 991.14 1 ISO 16649-3:2005 FD BAM 2001 APHA
Pathogenic E.coli	Food	BAM
Enterococci	Fish	AOAC, BAM FDA 1 ISO 7899
Staph aureus food	Food	MFHPB 2009 Bam 2001 FDA BAM/AOAC
Listeria	Food	MFHPB 1

		ISO 11290-1:2004
Yeast and moulds	Food	FDA, BAM 1
Pesticides	Agric product	AOAC

Most of the labs test in line with FDA, BAM / AOAC methods or by national standard methods. It appears that only one laboratory (from Trinidad and Tobago) is undertaking testing of histamine and lead in fish by the AOAC and Codex methods and none using the official EU method.

From Table 15, it appears that the majority of the testing is microbiological in relation to food and water safety (specifically *Salmonella,* coliforms and *E. coli* and coliforms. Out of nine labs reporting, only two of the laboratories surveyed are testing for heavy metals (lead, mercury or cadmium) and only one is conducting tests for marine biotoxins. Only two undertake any testing for histamines.

Table 15: Number of tests conducted by testing laboratories surveyed

Group of analyses	**2013 No of tests / year**	**2014 No of tests / year**	**2015 No of tests / year**	**No of labs reporting tests**
Food Microbiology	175 >1000 120 98 5000 0 131 30	180 >1000 135 114 5500 0 7 30	186 >1000 90 121 6000 0 0 30	7
Water microbiology	549 >1000 22 143 3 100 0 64 75	526 >1000 26 146 3 100 0 13 72	480 >1000 68 174 150 0 40 72	8
Food quality TVB-N, pH, Fish eye fluid	192 84 742 0	209 91 206 0	219 98 0	3
Histamines	99 6 0	113 8 0	133 15 0	2
Feed	1 100 3	1 100 0	2 150 0	3
Pesticide residues	13 174 0	17 217 0	24 386 1	3
Heavy metals Water	 >1000	 >1000	 >1000	2

Fish	0 100 0 94	0 102 0 76	92 105 0 58	
Veterinary Drugs	55	64	46	1
Contaminants	23	27	45	1
Sulfites	42 0 / 32	30 0 / 15	17 0 / 0	2
Toxins (fish)	0 273	0 303	0 521	1
Water chemistry	97	12	0	1

NB: No answer received from: Barbados, Dominica, Dominican Republic

4.4.5 Quality assurance of testing services

Seven of labs participate in Proficiency Testing programmes and 3 did not (Saint Vincent and the Grenadines, Saint Lucia, and Dominican Republic) while two labs gave no answer (assumed to indicate that they do not).

Three laboratories held accreditation, of which 2 labs were accredited in line with ISO 17025 by an international recognized Accreditation Body. The details are shown in Table 16. Even so, the scope of accreditation is narrow, with only 3 parameters accredited in conch (Jamaica) and one parameter in fish (in Suriname).

Table 16: Accreditation and scope of accreditation of Caribbean testing laboratories

Country / laboratory	Accreditation Body	Since	Test scope (no and parameters)
Jamaica	Jamaica National Agency for Accreditation (JANAAC)	Applied 2016	3 parameters in conch: • Cadmium, • Lead • Amnesic fish toxin
Suriname	JANAAC	No information	4 parameters in Fish and Fishery Products: • Refractive index of Fish-eye-fluid / Refractometer • pH measurement • TVB-N (Total Volatile Base Nitrogen) / Kjeltec method • Histamine / HPLC method
The Bahamas	Laboratory Accreditation Bureau; Fort Wayne, IN, USA	2011	17 parameters in seafood, food, water

5 DISCUSSION

5.1 Choice of impact assessment indicators

The consultants have collected a wide range of data during the impact assessment exercise, which represents an attempt to characterise in a quantitative way the features of the sanitary measures applied to fishery products by Competent Authorities of CARIFORUM countries.

Of the various indicators, those based on official statistics (section 4.1) are considered by the consultants to be the most valid and easiest to apply in future, since they are all based on externally available and verifiable data sources (as listed above). In fact, these indicators were also used by the consultants for the design of an online map-based infographic illustrating the status of sanitary controls for fishery products in the CARIFORUM region (https://goo.gl/maps/6bLMwQDohfP2).

All other indicators, whilst also valid, will require a specific data collection exercise in future, to solicit detailed information from Competent Authorities and testing laboratories within the region.

5.2 Survey methodology

The use of the questionnaire survey methodology applied by the consultants provides an effective way of generating impact assessment data. However, in this case the respondents were attendees at two training courses, one for testing laboratory staff and the other for competent authority staff. The approach had a number of limitations:

- The response rates were less than 100% (only 77% in the case of the CA survey and 92% in the case of testing laboratories).

- Some of the respondents were from Competent Authorities responsible for fishery product sanitary measures, others were from general food safety CAs, with fishery products within their portfolio. This gives rise to different levels of awareness regarding some of the system-level questions (for example with regard, to risk management, where all food safety risks need to be balanced), leading to several "don't know" or incomplete responses.

- Some CAs responsible for food safety of fishery products have invested in both testing laboratory and inspection capacities, and in fact, sometimes the same staff may have responsibilities in both functions. The survey is designed to separately assess these as separate functions (as indeed they are). Where they are mixed (along with the staff and financial resources) the survey is not likely to provide a clear picture of how resources are allocated between functions.

- Most CAs have internal laboratories as well as employing external laboratories for some testing. As a result, much testing for food safety of fishery products within the region (especially where it is required to be accredited) is undertaken under contract by laboratories other than those attending the training courses. Many laboratories providing relevant testing services in the region were therefore not assessed in this exercise. The dimensions of this study did not permit visits to the region to follow up on these activities, and the data from the attendees is therefore subject to a degree of sampling bias, and does not necessarily reflect the complete picture in terms of the amount, quality and scope of testing conducted.

Despite these limitations, the study is considered to provide a relevant set of possible indicators and indicative baseline values which provide new evidence regarding the status of sanitary controls and laboratory testing in the CARIFORUM region.

5.3 Interpretation of results

CARIFORUM countries employ significant resources with the aim of ensuring the sanitary condition of the fishery products produced and consigned to markets. All countries have developed some functions in this respect, and in seven of the 15 countries, Competent Authorities have established control systems for exports which are "at least equivalent" to EU controls (a condition for access to that market). A minimum of 150 professional staff are engaged on these tasks in the region (66 with degree level qualifications) and at least 10 laboratories with at least 54 staff are in operation.

The control challenge requires sanitary measures to be applied to over 4,000 vessels, mostly small scale, 192 establishments and 113 aquaculture farms. Overall, the 10 CAs responding performed 2,347 inspections during 2015, an average of 235 each. However, four authorities did not inspect fishing vessels at all and it appears that only 11% of the aquaculture facilities were inspected. None of the respondents were able to provide data on compliance and correction rates. A total of 1,222 export certificates for fishery products was issued in 2015, of which about a third were for consignments destined to the EU (which includes Caribbean and South American Departments of France). Overall, exports of fishery products from CARIFORUM countries were valued at US$378 million, suggesting that much trade is not certified by the Competent Authorities.

Although substantial economic resources are employed in assuring the safety of fishery products in the region, the study raises some serious questions regarding the extent of the control system and its effectiveness. Some examples of findings which raise concern are:

- Three of the CAs only applied controls to exports (with no domestic food safety system for fishery products).
- Four Authorities performed no inspections of vessels, one performed no inspections of establishments and only 13 inspections were performed on the 113 aquaculture establishments in the region, all suggesting some serious gaps in the control systems applied.
- A significant hazard of regional public health importance (ciguatera) is not monitored by any of the Competent Authorities; another important hazard in the tuna fisheries (histamine) is only routinely monitored by two Competent Authorities.
- Eighty percent of the Competent Authority staff consulted considered that their operational functions were insufficiently financed, but only one authority applied risk profiling as a means of focusing official control resources.
- Only two of the testing laboratories are accredited, which raises doubts regarding the capacity of the rest to take official control actions based on test results.
- Approximately 17% of the capital equipment in testing laboratories is out of order, suggesting that laboratories are invested beyond the operational capacity of their financial income.

6 CONCLUSIONS

The approach employed in this study has provided a series of meaningful measures of the status and impact of sanitary controls in the fishery sector of the CARIFORUM region. Several measures were identified which employ independently verifiable external data sources, giving rise to indicators with a high degree of validity and reliability.

For the more detailed data on the functioning of the Competent Authorities and testing laboratories, a questionnaire survey methodology was employed. Whilst this provided data with a high degree of granularity, the methodology was subject to the inherent sample bias, with the sample frame being attendees nominated to attend training courses supported by the 10th EDF SPS project. It was also

potentially subject to response bias in that not all persons surveyed responded (probably representing countries with the weakest control systems). Whilst this approach has therefore yielded interesting results, these should be regarded as illustrative at this stage and should be applied with caution in terms of the extent to which they are used to guide future investments in controls.

Nevertheless, the indicative results from the study shows that there are several areas where there are important gaps and weaknesses in the region's capacity to guarantee the safety of fishery products consigned to national and export markets. Despite significant investments by donors and national governments in control systems, these gaps in the implementation of sanitary controls have potential to undermine public health, trade and investment in the fishery sector.

7 RECOMMENDATIONS

In terms of the future application of the key performance indicators to the sanitary controls for fishery products in the region:

- The IICA and the CRFM are recommended to adopt the variables defined in this study as performance indicators in future studies regarding the impact of investments in the sanitary control in the fishery sector. However, it is also recommended that a more rigorous approach should be applied, which employs direct interviews with key informants in the relevant CAs and testing laboratories.

In terms of the future development of the sanitary controls for fishery products in the region, policy makers responsible for development of sanitary controls in the fishery sector and donors which support this area should adopt a more strategic approach, with greater focus on:

- the application of risk based controls to ensure scarce control resources are focused on the most significant hazards;
- greater use of cost-benefit analysis and business planning principles to ensure that investments in the sanitary control system are economically justifiable (especially in laboratory testing capacity);
- development of economically sustainable regional inspection services which can undertake inspection and testing services on behalf of national Competent Authorities.

Appendix 1: Questionnaire Official Control of Fishery Products in the Caribbean Region

Country:		
Name of National Competent Authority:		
Name of parent Ministry/organisation:		
Dimensions of the fishery sector operations which over which you apply sanitary controls.		
Number of aquaculture farms:		
Number small scale vessels (day fishing):		
Number of semi-industrial vessels (fresh fish)		
• Line / Longliners		
• Trawlers		
• Seiners		
Number freezer / factory vessels:		
Number establishments (including cold stores)		
• Total		
• EU approved		
Number of export consignments in 2015		
• EU		
• Other markets		
Scope of responsibilities/activity in relation to food safety of fishery products (indicate all that apply)		
• Import control / certification	Yes	No
• Export control/ certification	Yes	No
○ EU only	Yes	No
○ All destinations	Yes	No
• Domestic market controls	Yes	No
Laboratory resources available to CA:		
• Laboratory internal to the CA	Yes	No
• Use of external laboratory:	Yes	No
○ National	Yes	No
○ International	Yes	No
Food safety parameters tested (please list)		

• Chemical	
• Microbiological	
Parameters within scope of ISO17025 accreditation (please list)	
• Chemical	
• Microbiological	
Staff resources of the Competent Authority	
Number of technical staff engaged in sanitary inspections	
Number with highest qualifications at:	
• Secondary level	
• Technical / vocation qualification	
• University level	
Dimensions of food safety activity of the Competent Authority	
Number of food safety inspections of performed in 2015:	
• Vessels	
• establishments	
• aquaculture	
Main food safety risks of concern (indicate no. of confirmed non-compliances detected in 2015)	

Appendix 2: Questionnaire – Testing Laboratories

1.1 Identification and location of your organisation / laboratory

Name of the laboratory	
Address / Country Phone / Email	
Type of laboratory	Public ( ), private ( ), academia ( ), research ( ), other ( ) If other specify:
Officially designated by the Competent Authority	Yes ( ) No ( ) If yes, for what tests and products (please specify)
Name of Competent authority / parent organisation / ministry	

1.2 Working areas, put an X in the box to indicate which analytical service you offer:

Organoleptic, sensory		Food safety - residues and contaminants	
Food microbiology, bacteriology		Toxins	
Pathogen testing		Veterinary testing	
Food quality, chemistry		Environmental testing (air, soil)	
GMO, Biotechnology		Water chemistry	
Water microbiology		Feed analysis	
Veterinary drugs residues analysis		Others, please specify if	
Pesticides residue analysis			

1.3 Activity in relation to food safety of fishery products – put an X in the box for those that apply to your service

Import control		Routine surveillance	
Export control national		Technical support to industry	
Export control EU		Certification	
Monitoring programmes		Other, specify if	

1.4 Use of external laboratories, is your laboratory subcontracting tests?

No ( ) Yes ( )

If yes, please specify in the table below

	Location of laboratory	What tests	Why
National			
International			

Others			

1.5 Main products tested (on what)

1.6 Tests conducted for export to the European Union, others

	Parameter/matrix	Reference	
1.	Histamine in fish		
2.	Salmonella in water	ISO	
3.			

1.7 Turnaround time of test results _____(days)

1.8 Provision of opinion yes ( ) No ( )

1.9 Is the laboratory involved in sample taking? Yes ( ) No ( )

If yes, is in what area put an X in the box

Water		Others, specify
Food		

1.10 Major sources of funding for the laboratory (e.g. state budget, donor support)

Capital investment (e.g. equipment, buildings)

Operating expenses (e. purchase of reagents, salaries)

2. Human resources

2.1 Staff employed by your laboratory

Qualification	Number of persons	Department*	% of time working in the laboratory
University graduates PhD MSc BSc Appl.			
High school, 3 years' experience			
High school, < 3 years' experience			

Technician			
Admin personnel (non-technical)			
Service, cleaners; maintenance etc.			
Total personnel			

*C = Chemistry, M= Microbiology, T = Toxins

2.2 Average staff experience in years

2.3 Staff training: The laboratory has

Activity	Yes	No
Training programme for regular training		
Training programme for new personnel		
Budget allocation for training		
System to evaluate training programme		
System to evaluate personnel performance		
System to record staff training		

3. Housing and system infrastructure

3.1 Premises construction

Built (year) _____

Floor plan area _____ (sqm) and number of rooms ____

Conditions
Good ( ) Average ( ) Poor ( )

1.2 Indicate areas available

Description	Present Yes or No	Number	sqm	Condition		
				good	average	poor
Offices and admin areas						
Electronic data processing, LIMS						
Chemical department						
Microbiology						
Toxin laboratory						
Sample reception						
Areas for						
Media preparation						
Sterilisation						
Incubation						
Quarantine						
Sample preparation						
Weighting						
Instrumentation						

Sample storage						
Instrument rooms						
Storage for chemicals, solvents						
General storage area						
Maintenance workshop						
Gas room						
Lecture, training room						
Library						
Lunch room						
Dressing room						
Others, list						

4 Instruments and equipment

1.1 List the main instruments and equipment available, their operation status, date of purchase

Type of equipment (brand) and functions	Operational status		Purchase date/brand	Analysis mainly for	Calibration
	In use	out of service			
Atomic Absorption Spectrometer					
Autoclave (clean)					
Autoclave (dirty)					
Biosafety Cabinet class II					
ELISA equipment (Washer / Incubator / Reader)					
Dry ice machine					
Freezer -20°C					
Balance					
Gas Chromatography with FIF ECD NPD FPD detection system etc.					
…..					

4.2 Maintenance of equipment?

Yes ( ) No ( )
If yes, do you have maintenance contracts and for which equipment?

5. List of routine analysis, test performed by the laboratory

1.1 Enter all relevant tests performed in the laboratory (one test/line) and provide requested details for each test

Type of testing undertaken

Pathogen Contaminant Parameter	Sampling method	Sample matrix	Purpose2,3,4 Category	Equipment used	Testing method5 Reference source, year, no.	Status of method6SOP available? Y/N	Estimated sample per year

Indicate which methods are used (AOAC, ISO, OIE, Codex, in-house/self-developed, nat. standards, others?)
How were the methods selected?
Are the methods validated?
SOPS for methods?
Standards and reference chemicals for these methods available and are they certified and stored appr.

[2] Codes for purpose: A = Enforcement nat. regulations; B= Application of international standard; C = commercial requirement (import/export control; D Trade; E = Adulteration of products; F = technical support to industry; G = food safety; H = research; I = investigation of outbreaks; J = Others
[3] Category: X= Verification programme; Y = monitoring programme; Z = surveillance programme
[4] N = Quantitative; L = Qualitative
[5] ISO; AOAC; OECD; OIE; Codex; Scientific literature; in-house, nat. standard, others
[6] A = accredited; B= validated; C = certified; D= none

1.2 According to the type of analysis indicate the number performed over the last 3 years

Group of analyses	2013	2014	2015
Food Microbiology			
Water microbiology			
Food quality			
Histamines			
Feed			
Pesticide residues			
Heavy metals Water Fish			
Veterinary Drugs			
Contaminants			
Sulfites			
Toxins (fish)			

5.3 Do the following supplies meet your laboratories needs?

Supply	Yes	No	Comment
Gas			
Vacuum			
Air			
Electrical			
Water			
Purified water system			
UPS			
Stabilizers			
Supplies			

6. Quality assurance programme, accreditation

1.1 Has the laboratory implemented a quality management system?

	Yes	No	
ISO 17025			
ISO 9001			
Other			

1.2 Indicate which of the following elements of a quality management programmes exist at the laboratory and in which analysis and group of analyses

Elements of QA / QC programme	Exist	Comment
Quality Manager		
Quality assurance Unit		
Quality Manual		
Review schedule for manual		
Environmental controls		

System for laboratory waste disposal		
Calibration of equipment		
Preventive maintenance programme for instruments		
Control charts		
Documented standardized procedures and methods		
Internal control of laboratory procedures (blind spiked samples e.g.)		
Use of standards and reference material		
Test report forms		
Procedure of authorized staff to use and sign the results of analysis		

6.3 Does the laboratory participate in national, international proficiency testing (PT) programmes?
Yes ( ) No ( )

6.4 Does the laboratory hold any form of accreditation?
Yes ( ) No ( )

6.5 If yes, indicate below relevant standards, accreditation bodies, year

Governmental		
Private national Body		
International		
Name of Accreditation Body		
Address of Accreditation Body		
Year of accreditation		

6.6. Scope of accreditation / parameters

	Parameters	Matrix	Method
1			
2			
3			
4 ….			

Appendix 3: Breakdown of sanitary status and trade in 15 CARICOM countries

Country	EU Fishery products	EU LBM etc.	EU Aquaculture	No. FV+ ZX	No. PP + CS	2014 EU exports US$ 1,000	2015 EU exports US$ 1,000	2014 Quantity in 100kg	2015 Quantity in 100kg	2015 Total Exports US$ 1,000	2015 HS03 imports US$1000	2015 HS1604 imports US$1000	2015 HS03+16 imports US$1000	Balance of trade (exp-imp)	EU% of exports 2015
1. Antigua and Barbuda	Live lobsters				8	5	42	7	43	42	5,335	1176	6,511	- 6,469	100%
2. Bahamas	Authorised				15	14,730	18,342	6,993	6.043	62,141	15,648	7607	23,255	38,886	30%
3. Barbados										422	17,239	7696	24,935	- 24,513	
4. Belize	Authorised		Authorised	8	2	2,602	14,419	11,540	49,469	44,536	395	437	832	43,704	32%
5. Dominica										119	1,626	943	2,569	- 2,450	
6. Dominican Republic						145	226	101	97	3,378	117,401	47,558	164,959	- 161,581	
7. Grenada	Authorised			5	5	336	403	966	920	5,843	1,675	535	2,210	3,633	7%
8. Guyana	Authorised				4	4,785	3,892	13,657	6,787	87,263	174	2314	2,488	84,775	4%
9. Haiti						1	1	0	0	14,495	28,185	9510	37,695	- 23,200	
10. Jamaica	Authorised	Marine gastropods	Authorised	15	7	4,380	6,994	5,712	6,109	14,322	47,150	18697	65,847	- 51,525	49%
11. Saint Kitts and Nevis										80	2,537	171	2,708	- 2,628	
12. Saint Lucia										17	3,100	2368	5,468	- 5,451	
13. Saint Vincent and Grenadines										2,977	1,098	187	1,285	1,692	
14. Suriname	Authorised		Authorised		13	14,090	22,136	53,774	63,661	77,665	3,341	3861	7,202	70,463	29%
15. Trinidad and Tobago						20	27	50	55	65,225	38,018	7874	45,892	19,333	
Totals	7	1	3	28	54	41,094	66,482	92,800	127,147	378,525	282,922	110,934	393,856	- 15,331	18%

ANNEX 7: INFORMATION PRODUCTS

Newsletter 1: Food safety of fishery products

World Seafood Congress to be held in Iceland, September 2017

The International Association of Fish Inspectors (IAFI) has announced that the World Seafood Congress will be held 10 - 13 September 2017 in Reykjavík, Iceland, in collaboration with MATIS the Icelandic Food and Biotech R&D institute. The theme of the Congress is Growth in the Blue Bio-economy and the four-day event will include presentations addressing a practical approach and cutting edge research for market innovation in safe seafood supply and food integrity. This event, which takes place every two years, brings together researchers, fish inspectors, fish quality control professionals and seafood processors and traders from all over the world. The event is sponsored by a range of institutional and commercial sponsors, including the FAO and UNIDO who will fund participation from developing countries. As always the first day of the event will be dedicated exclusively to regional meetings for colleagues from developing regions, with special sessions for Latin America and the Caribbean, Africa and Asia. Abstracts for oral and poster presentations are now being accepted for all sessions. A poster competition for younger researchers will also be held. The event is timed to coincide with IceFish, the Icelandic Fisheries Exhibition, Iceland's premier commercial exhibition for the fishing, processing and aquaculture industries which will be held 13 - 15 September 2017.

The last Congress was held in 2015 in Grimsby UK, and a 2019 Congress will be held in Ho Chi Minh City, Vietnam. Attendance at the Congress includes two years of membership of IAFI. More information regarding the Congress is available at http://www.wsc2017.com/ .

The International Association of Fish Inspectors (IAFI) was established in 1999 to serve the world fish inspection community. IAFI exists to promote the exchange of ideas and information, foster interaction, understanding and professional collaboration among individuals, organisations, and governments, disseminate knowledge about seafood and associated products inspection, and promote advancement of the state-of-the-art in fish inspection research and education. For more information visit http://www.iafi.net.

Last meeting of the Codex Committee on Fish and Fishery Products

The FAO and WHO have finalised the documentation from the 34th and latest meeting of the Codex Committee on Fish and Fishery Products (CCFFP) held in Ålesund, Norway, 19 - 24 October 2015 and attended by technical experts, senior administrators and researchers from 49 member countries, one member organization (EU) and one international organization.

The Committee was established in 1966 to produce worldwide standards for fresh, frozen or otherwise processed fish, crustaceans and molluscs. Over the years, the committee was responsible for development of a range of standards for fish and fishery products, including

- Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories (1999)
- Model Certificate for Fish and Fishery Products (2004)
- Standard for Quick Frozen Finfish, Uneviscerated and Eviscerated (1995)
- Standard for Canned Finfish 2016
- Standard for Quick Frozen Blocks of Fish Fillets, Minced Fish Flesh and Mixtures of Fillets and Minced Fish Flesh 2016

- Standard for Quick Frozen Fish Sticks (Fish Fingers), Fish Portions and Fish Fillets - Breaded or in Batter 2016
- Standard for Salted Fish and Dried Salted Fish of the Gadidae Family of Fish2016
- Standard for Quick Frozen Fish Fillets 2014
- Standard for Crackers from Marine and Freshwater Fish, Crustaceans and Molluscan Shellfish 2016
- Standard for Fish Sauce 2013
- Standard for Smoked Fish, Smoke-Flavoured Fish and Smoke-Dried Fish 2015

In the last meeting, the participants finalised the sections in the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) with regard to processing of fish sauce, fresh and quick frozen raw scallop products and sturgeon caviar. Although this Code of Practice is not yet finalised, the Committee decided to discontinue continue work on modified atmosphere packaging (MAP) for fishery products. They also decided that the outstanding issues of food additives, and sampling and control of histamine should be finalised through correspondence.

Norway, as chair of the Committee, thanked all delegations for their valuable contributions and work on finding consensus on important issues over the years. Norway underlined the need for delegations to continue good work on seafood issues, to coordinate their work in the national arena and to use the Codex general subject committees for future seafood matters.

"Significant risks" claim for consumption of Trinidadian fish and shrimp from Gulf of Paria

Following an oil spill in December 2013, evidence is emerging of significant and persistent contamination of fish in the Gulf of Paria, a semi-enclosed inland sea located between the island of Trinidad (Republic of Trinidad and Tobago) and the east coast of Venezuela. The spill, arising from a break in a pipeline operated by Trinidad's national oil company, Petrotrin, resulted in a reported 8,000 barrels of oil being released over a period of several days. The impacts have recently been investigated by the NGO Fishermen and Friends of the Sea (FFOS), by sampling and testing of fish and sediment, with analysis undertaken by the Caribbean Industrial Research Institute (CARIRI) and University of Trinidad and Tobago (UTT). The results suggest high levels of Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons (PAH) in the flesh of bottom dwelling species of fish and shrimp, as well as in sediments. These are all persistent organic pollutants, and several of the compounds identified are known to be highly carcinogenic. According to Dr. Natasha Ramroop Singh and Professor Valerie StouteIt of the UTT, writing in September 2016, "*it is clear that the Gulf is significantly contaminated with a variety of Persistent Organic Pollutants (PAHs and PCBs)*" and "*their presence in the marine ecosystem will eventually lead to higher and higher levels in fish and, when consumed by people, to high levels in humans, thereby posing a significant threat to human health*". The NGO Fishermen and Friends of the Sea has called on the government of Trinidad and Tobago to close the fishery, compensate the fishermen for their loss of income, and de-contaminate the area.

EU project identifies emerging hazards in seafood

The ECsafeSEAFOOD project is a four-year research project that aims to evaluate food safety issues related to contaminants present in seafood as a result of environmental contamination. One of the leading institutions, the Norwegian Veterinary Institute (NVI) has hosted a seminar on contaminants of emerging concern in seafood addressing xenobiotic contaminants, algal biotoxins, environmental factors, climate change, micro-plastics and other emerging factors potentially affecting the safety of seafood, and which are not currently addressed in EU legislation. The project will also host a stakeholder event and open science meeting "Seafood Safety: New Findings & Innovation Challenges" to be held in Brussels in

January 2017. ECsafeSEAFOOD is led by the Instituto Português do Mar e da Atmosfera (IPMA), and has a budget of more than €5 million.

SPS Professionals from CARIFORUM receive food safety management training in Iceland

Eighteen professionals from CARIFORUM recently received management training on Sanitary and Phytosanitary Measures (SPS) at the UN University Fisheries Training Programme in Iceland. The training was offered under the capacity-building component of an EU-sponsored project to implement SPS Measures under the 10th European Development Fund (EDF) regime, through a component implemented by the Inter-American Institute for Co-operation on Agriculture (IICA) and the Caribbean Regional Fisheries Mechanism (CRFM).

The two-week training course in Iceland was delivered to food safety professionals representing all CARIFORUM Countries, and addressed a range of food safety topics, with a strong reference to the seafood sector. CRFM's Deputy Executive Director Dr. Susan Singh-Renton said that, "The CRFM / UNU - FTP SPS Management Course has been very successful in achieving its objective of exposing CARIFORUM fisheries and agricultural health and food safety experts to the key lessons and best practices of the Icelandic fishing industry in producing safe and wholesome fishery products of an international standard."

The course was praised by the participants, Director of fisheries resources at the Dominican Council for Fisheries and Aquaculture (CODOPESCA) in the Dominican Republic, Jeannette Mateo, suggested that biologists, inspectors, fisheries officers and consumer protection agents in her country should be trained in basic concepts of SPS. "One of the more frequent but often overlooked problems within the Caribbean is food fraud and mislabelling," noted Dr. Wintorph Marsden, Senior Veterinary Officer in Jamaica's Ministry of Industry, Commerce, Agriculture and Fisheries. Marsden said that Jamaica is considered a major trans-shipment hub for fish and fishery products to the wider Caribbean, and so the burden is on Jamaica, as a first point of entry, to implement a system of verification of products entering its food chain.

Chairman of the Caribbean Fisheries Forum, Denzil Roberts, who is also the Chief Fisheries Officer in Guyana, noted that "the fisheries sector within the CARIFORUM region continues to play an important role in rural development, food and nutrition security, income generation and foreign exchange earnings. Dr. Singh-Renton said that the CRFM will also strive to do its part to provide follow-up regional support for improved SPS management for the region's fishing industries, including facilitating continued networking among the course participants. She added that, "At the close of the course, participants reflected on, and also documented, how they would apply what they had learned to improve fisheries SPS management in their home countries".

Grant funding for attendance of young fish technologists at the 2017 World Seafood Congress

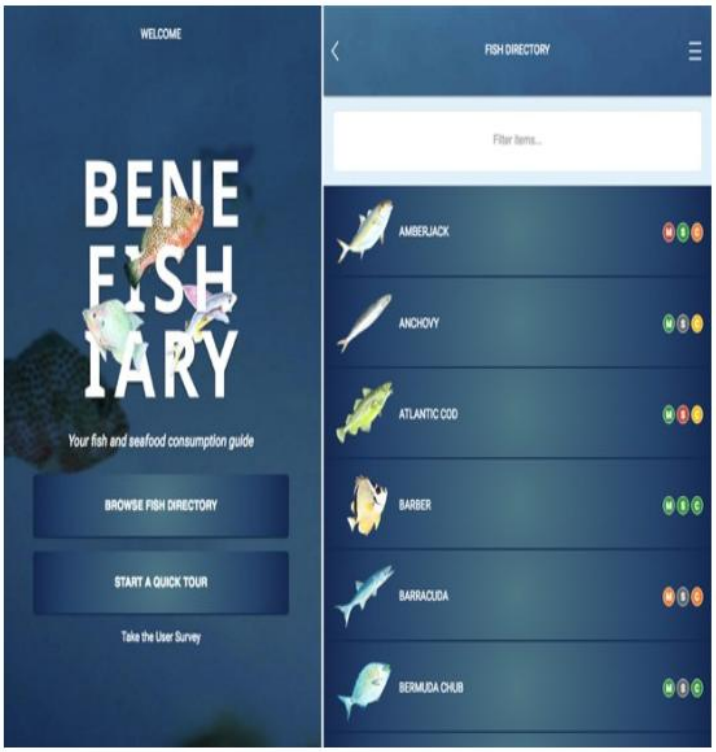
The IAFI Peter Howgate Award is a tribute to Peter Howgate's work and career, and a recognition of his immense, and ongoing contribution to the field of fish technology and the people who work in it, both during his 35 years at the UK's Torry Research Station, UK, and thereafter. The Award was set up by fish technology professionals around the world, with the help of the Seafood HACCP Discussion List community and was adopted by the International Association of Fish Inspectors (IAFI) in 2014.

The 2017 Peter Howgate Award will fund the attendance of a young fish technologist (under 30 years of age) to the IAFI World Seafood Congress 2017 (see http://www.wsc2017.com), to be held in Reykjavik, Iceland, from 10 - 13 September 2017. The Congress is being held to coincide with the Icelandic Fisheries Exhibition from 13 - 15 September 2017. The Award will cover travel, accommodation and the congress fee, and this will afford the winning applicant a career changing opportunity to gain insights and

build networks in the global fishery sector. The deadline for submission of applications is **31 March 2017**. More information and an application form are available at www.peterhowgateaward.com. You can also visit the Facebook page for updates and information about previous awards (https://www.facebook.com/PeterHowgateAward).

University of Hawaii designs new app to assess benefits and risks of fish consumption

BeneFISHiary, an app created in part by University of Hawaii provides location-specific data and the risks and benefits of Bermudian fish species. The app was developed by University of Hawaii in collaboration with the Ocean and Human Health Research Programme and HUACTIVE. The app enables the users to search or browse about fish species and get detailed information about the mercury concentrations and nutrients such as selenium and omega-3 fatty acids. It also provides information about the sustainability of local and imported fish, as well as which lower mercury level fish can substitute for their higher relatives. The app was developed following a study "Examining the Impact of a Public Health Message on Fish Consumption in Bermuda" which found that public health messaging warning of the dangers of mercury exposure from consumption of certain fish appeared to be effective, but adjustments needed to be made to promote consumption of healthy and sustainable fish with lower mercury levels. The BeneFISHiary app was created to help consumers make those adjustments, as well as healthcare providers who counsel pregnant women. The BeneFISHiary app currently in a beta version, was recognized with a 2016 International Association for Ecology and Health Small Grant Award. Source: www.hawaii.edu

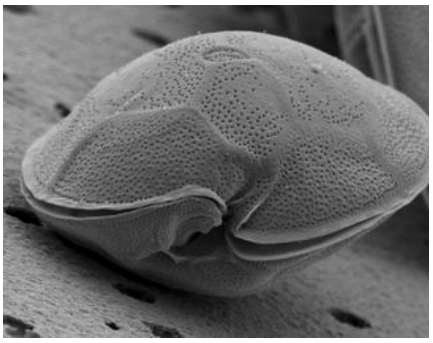


Newsletter 2: Food safety of fishery products

European Food Safety Authority launches project to fight the emerging risk of ciguatoxin food poisoning in the EU

A cooperation project on ciguatoxin food poisoning involving 13 organisations from six Member States and the European Food Safety Authority has been launched. Representatives of Spain and EFSA signed a Framework Partnership Agreement on 19 April 2016 to carry out a four-year project on risk characterisation of ciguatera food poisoning in Europe.

Ciguatoxin is found in fish that feed on the marine dinoflagellate *Gambierdiscus toxicus* that produces the toxic substance. The toxin can enter the food chain and becomes concentrated in predatory fish. A wide range of species can be affected including snappers, groupers and barracudas. Consumers eating affected fish can suffer from a range of symptoms including gastrointestinal and serious long term neurological effects. It can result in death. It is a major food safety hazard in fish caught over coral reefs in tropical waters. The current estimated global incidence annually is 20,000 to 50,000 people, though a large number of cases are believed to go unreported.



The marine algae *Gambierdiscus toxicus*, is responsible for producing ciguatera toxins (Image taken by Dr. Maria A. Faust, Department of Botany, National Museum of Natural History, Smithsonian Institution, Washington D.C., U.S.A.)

Since 2008, Spain and Portugal have reported outbreaks of ciguatoxin food poisoning in the Canary Islands and Madeira. New findings suggest the microorganism is becoming more widespread in the Mediterranean, possibly due to changes in oceanographic conditions linked to climate change. So far, a total of 14 outbreaks have been documented in the EU.

The project will study the epidemiology of specific outbreaks and cases of ciguatoxin poisoning, it will sample fish and microalgae to try and identify the species, locations and other factors involved in toxicity, and work will also proceed on the development of standardised sample preparation and testing methods. Coordination of the project is led by Dr. Ana Canals Caballero, representing Spain on EFSA's Advisory Forum, and Felipa Melo Vasconcelos, from the Economic and Food Safety Authority of Portugal (ASAE).

Whilst ciguatoxin is a well-known in the Caribbean region, until now Competent Authorities responsible for the safety of fishery products have not organised a coordinated response to this hazard. Consumers and authorities rely on the local knowledge of fishermen regarding the distribution of fish which may be toxic. However, this may no longer be sufficient given that it is clear from the EU experience that this hazard can emerge in areas where it was previously not known. Periodically, suspected outbreaks are reported to occur, but due to lack of epidemiological coordination and laboratory testing capacity they are not always followed up. There is a clear need for a regionally coordinated response to this hazard in the region. Given that French Overseas Departments in the Caribbean are also within the EU (and trade with the seven CARICOM countries authorised to supply the EU market) there is a case for seeking ways to link the Caribbean risk assessors to this important new EFSA initiative.

Two CARICOM Countries report food safety concerns to Codex Committee

The 20th Session of the FAO / WHO Coordinating Committee for Latin America and the Caribbean was held from 21 – 25 November 2016 in Viña del Mar, Chile. FAO and WHO jointly presented an assessment of responses received following a 2016 survey of the food safety and quality situation in 33 members from Latin America and the Caribbean region. The survey asked respondents to identify the most critical and emerging issues.

In general, concerns for the regulatory landscape ranked first on the list (23%) followed by the need for improved capacity for evidence-based decision making (15%). On emerging issues, the countries also identified new technologies, climate change and food consumption trends as the predominant concerns. Only two CARICOM members responded to the survey (Grenada and St. Kitts & Nevis) reporting concerns over zoonotic diseases, trade globalisation, biosafety of genetically modified foods and increasing public attention to food safety were all identified as high priority issues. More information is available from http://www.fao.org/fao-who-codexalimentarius/meetings-reports/detail/en/?meeting=CCLAC&session=20

European Food Safety Authority Reports on use of Malachite green in aquaculture

In 2016 the European Commission requested the EFSA to investigate the safety of malachite green (MG), a dyestuff which is widely used the global aquaculture sector as an antibacterial treatment, but is not registered for use in food-producing animals in the European Union. The European Commission specifically requested the EFSA to evaluate whether a reference point for action (RPA) of 2 µg / kg for the sum of MG and its major metabolite leucomalachite green (LMG) was adequate to protect public health. Available occurrence data were not suitable for a reliable exposure assessment. The hypothetical dietary exposure was calculated, considering the RPA as occurrence value for all types of fish, fish products and crustaceans. Mean dietary exposure across different European dietary surveys and age classes would range from 0.1 to 5.0 ng / kg body weight (bw) per day. For high and frequent fish consumers, the exposure would range from 1.3 to 11.8 ng / kg bw per day.

Malachite green, an organic compound used as a dyestuff is allowed as a treatment for ornamental fish, but is often banned in the farming of fish for human consumption

Although both MG and LMG may be considered as carcinogenic and as genotoxic in vivo, the level of exposure to be expected from high and frequent consumption of aquaculture products were factors of 10^5 to 10^6 smaller than the minimum levels implicated with these effects. The EFSA CONTAM Panel concluded that it is unlikely that exposure to food contaminated with MG / LMG at or below the RPA of 2 µg/kg represents a health concern.

The implication for risk management authorities in the Caribbean region, where malachite green is potentially applied in the aquaculture sector, is that, for consumption levels of the same order as encountered in the EU, a reference point for action (RPA) of 2 µg / kg for the sum of MG and its major metabolite leucomalachite green (LMG) in aquaculture products could be considered.

Risk of contaminated aquaculture products from India entering CARICOM market

At a meeting of the Standing Committee on Plants, Animals, Food and Feed in October 2016, EU Member States and the Commission held an exchange of views on emergency measures applicable to consignments of aquaculture products imported from India and intended for human consumption. The discussion followed persistent rapid alerts arising from the detection of residues of chloramphenicol, tetracycline, oxytetracycline, chlortetracycline and metabolites of nitrofurans in aquaculture products imported from India. The Commission also noted that the results of an FVO inspection mission to India in March 2014 found very unsatisfactory official controls on the use of veterinary medicinal products and confirmed that India has relied until now only on pre-harvest and pre-export testing programmes. The Committee recommended an increased rate of sampling to 50% of all consignments, subsequently adopted by the European Commission for implementation at EU border inspection posts.

India is a major global supplier of farmed shrimp, including to the Caribbean tourist trade, but the EU has raised concerns regarding its safety

India is one of several suppliers of frozen farmed shrimp to CARICOM countries, accounting for imports to the region worth US$1.2 million in 2015 (about 5% of the imports of these species), where these products mostly enter the tourist trade. However, recent studies conducted by consultants working under the EU 10th SPS Project suggest that import controls for fishery products in the region are not designed taking into account food safety risks such as veterinary drug residues. Given this clear new evidence from the EU regarding ongoing contamination of Indian shrimp with several banned substances, there is a need for Competent Authorities in the region to ensure that these imported products meet food safety requirements before they are released to the market.

New evidence that fraud in fishery products is a global problem

In recent months both the EU and the USA have published evidence of massive fraud in the seafood trade. The European Commission published the results of EU-wide control plans to assess the prevalence of fraudulent practices in the marketing of fish, carried out from June to November 2015. Nearly 4,000 samples of 150 different species were collected from all stages of the food production chain. Six percent of the samples were found to be fraudulently labelled. The most common non-compliances were detected in Grouper (*Epinephelus* spp.), Common sole (*Solea solea*) and Yellowfin sole (*Limanda aspera*). The NGO marine advocacy group Oceana also conducted a global survey in 2016, and found that overall 19% of fish samples were mislabelled for species. There were several outstanding examples of fraud; 82% of the 200 samples of grouper, perch and swordfish in Italy were mislabelled; a study of Brussels restaurants found 98% of 69 bluefin tuna dishes tested were of other species. In the USA, Asian catfish was found to be the type of fish most often sold as a different, higher value type of fish, such as perch, grouper, sole or place; in fact, Asian catfish (*Pangasius*) was sold as 18 different types of fish.

Fraudulent descriptions of fishery products, as well as damaging the economic interests of the consumer, by paying for a higher value species than is received, carries significant food safety risks related to species linked hazards (such as ciguatera, or histamine), as well as losing the ability to trace the products

to its origin in case of a food safety incident. Whilst none of the data in these studies relates specifically to the Caribbean, the CARICOM region imported an estimated US$392 million worth of fishery products in 2015, and given the extent of the global problem, it is likely that some of this is being sold fraudulently, especially since significant quantities are imported from the USA, where mis-labelling of snappers is a common occurrence. There is a need for the Competent Authorities responsible for import and consumer protection to ensure that this problem is addressed in a structured manner.

Director of fisheries resources at the Dominican Council for Fisheries and Aquaculture (CODOPESCA) in the Dominican Republic, Jeannette Mateo, is very aware of the problem. She has learnt that Asian *Pangasius*, is being sold cheaply in the region and marketed at times as "grouper" — not only in supermarkets, but also at restaurants. "This is relevant to the Dominican Republic and the Caribbean, where imported fish are in some cases marketed at lower prices than the local ones, not only due to the lower production cost of fish products such as tilapia and *Pangasius* in comparison with those produced in the country, but also because of unfair practices in trade," Mateo said.

Press release No. 1

EU works with the Caribbean Regional Fisheries Mechanism to help to make Caribbean fishery products safer

A fisheries and aquaculture food safety capacity building activity, funded by the EU and delivered under the technical leadership of IICA and the CRFM, is helping CARIFORUM countries to improve the safety of fish and fishery products for consumers in national and export markets. The activity, which is part of a broader programme and which started in September 2016 and will run until January 2017, has prepared eight new manuals to help fish inspectors apply the best international practices to the inspection of fishing vessels, processing establishments and aquaculture facilities. The subjects covered include HACCP, traceability, and for the first time, a compendium of food safety hazards encountered in Caribbean fishery products. In addition, the project has prepared two manuals for laboratories, on the testing of fishery products to make sure they are safe, and ensuring that laboratory test results are accurate.

To help disseminate these new manuals, the project will also run two one-week courses for 30 participants from CARIFORUM countries, to be held in Saint Vincent and the Grenadines at the end of November. This will present the manuals, as well providing training in best international practices in fish inspection, and demonstrating some of the modern approaches to rapid and field testing to allow better decisions to be made about the safety of fishery products. The course will be attended by participants from Antigua and Barbuda, The Bahamas, Barbados, Belize, the Commonwealth of Dominica, the Dominican Republic, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Suriname, Saint Vincent and the Grenadines and Trinidad and Tobago.

The fishery sector is important for many countries in the region, as a source of employment, and export revenues. Overall, in 2015, the CARIFORUM countries exported fish worth US$378 million to many countries around the world. Whilst 89% of this is from just five countries (Bahamas, Belize, Guyana, Suriname and Trinidad and Tobago) the fishery sector of many other countries in the region delivers supplies directly to their tourist sector. The continued economic importance of the fishery revenue therefore depends on making sure that fish meets international sanitary standards, and governments in the region are therefore very interested to ensure that typical food safety hazards such a ciguatera and histamine are under control.

The project “Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade” is implemented by the Inter-American Institute for Cooperation on Agriculture (IICA). The objective of the project is “*To build capacities of CARIFORUM States in health and food safety requirements of fisheries and aquaculture (inland, marine) products and as such ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.”*

In this task IICA is supported by the Caribbean Regional Fisheries Mechanism (CRFM) and, for the present training activity, also by a team of consultants from Megapesca in Portugal. The project is financed under the EU project “10th EDF Sanitary and Phytosanitary Measures Project”. The expected result of the current activity is that capacities will be strengthened at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

Photo Caption: Fishing and processing conch is an important economic activity for many Caribbean States
Credit: Megapesca Lda. Portugal

Press release No. 2

Caribbean Regional Fisheries Mechanism hosts training in fishery sector sanitary controls in St. Vincent and the Grenadines

Two weeks of training covering "Food safety in the fishery sector" and "Fishery products laboratory testing" was delivered to 30 inspector and laboratory analysts from 15 CARIFORUM countries during the period 28 November to 9 December 2016, by four international experts in inspection, control and testing in the fishery sector.

The training was based around eight operational manuals developed under the project "Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade" which was funded by the European Union. The training course covered food safety hazards, best international practices in fish inspection at each stage of the supply chain, controls in aquaculture, and traceability as well as modern approaches to laboratory testing and accreditation. Particular attention was paid to explaining the sanitary requirements for exporting fishery and aquaculture products to the EU and other developed country markets. Practical work helped the participants to understand the role of rapid and field testing to allow better decisions to be made about the safety of fishery products.

The course was attended by participants from Antigua and Barbuda, the Bahamas, Barbados, Belize, the Commonwealth of Dominica, the Dominican Republic, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Suriname, Saint Vincent and the Grenadines, and Trinidad and Tobago. The Caribbean Agricultural Health and Food Safety Agency (CAHFSA) which is based in Paramaribo, Suriname, also attended. After the course, rapid testing equipment was donated to participants to use in their own countries, and modern histamine testing equipment for assessing the safety of products such as tunas, was also donated to the Fisheries Department of St. Vincent and the Grenadines.

The training was highly appreciated by all the participants. Avis O'Reilly-Richardson, Senior Chemist from the Food Safety & Technology Laboratory, Bahamas said that "*This course will allow the stream-lining of our laboratory testing capabilities, and has provided a better understanding of what the EU wants*". Another participant said "*There are many areas in my country where there are no controls e.g. imports, fishing vessels etc. The information received, as well as the discussions, with other participants will help me to develop systems for these controls in the future*." CRFM's Project Coordinator, Dr. Susan Singh-Renton, Deputy Executive Director of the Caribbean Regional Fisheries Mechanism Secretariat welcomed the course saying that "The two courses allowed the trainees to develop a stronger understanding of the full extent of laboratory and regulatory requirements for fulfilling international sanitary standards for fish and fishery products, and allowed them also to share lessons and best practices in considering possible solutions for many of the challenges faced in putting the methods into actual practice in their home countries."

The activity "Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade" was funded under the EU's "10th EDF Sanitary and Phytosanitary Measures Project and delivered under the technical leadership of the Inter-American Institute for Cooperation on Agriculture and the Caribbean Regional Fisheries Mechanism, supported by a team of consultants from Megapesca in Portugal. The aim was to continue to help CARIFORUM countries to improve the safety of fish and fishery products for consumers in national and export markets. Apart from the delivery of these training courses, the capacity building activity which started in September 2016 and will run until January 2017, has prepared six new manuals to help fish inspectors apply the best international practices to the inspection of fishing vessels, processing establishments and aquaculture facilities. The subjects covered include HACCP, traceability, and for the

first time, a compendium of food safety hazards encountered in Caribbean fishery products. In addition, the project has prepared two manuals for laboratories, on the testing of fishery products to make sure they are safe, and ensuring that laboratory test results are accurate.

The fishery sector is important for many countries in the region, as a source of employment, and export revenues. Overall, in 2015, the CARIFORUM countries exported fish worth US$378 million to many countries around the world. Whilst 89% of this is from just five countries (The Bahamas, Belize, Guyana, Suriname and Trinidad and Tobago) the fishery sector of many other countries in the region delivers supplies directly to their tourist sector. The continued economic importance of the fishery revenue therefore depends on making sure that fish meets international sanitary standards, and governments in the region are therefore very interested to ensure that regionally important food safety hazards such a ciguatera and histamine are under control.

The EU project "10th EDF Sanitary and Phytosanitary Measures Project" has the expected result that capacities will be strengthened at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

Photo Caption: Participants at the training course in St. Vincent and the Grenadines

Participants attending the training course "Fishery products laboratory testing" at the official opening, attended by Mr. Raymond Ryan (Permanent Secretary, Ministry of Agriculture, St. Vincent and the Grenadines), Mr. Michael Dalton (IICA Representative to St. Vincent and the Grenadines), Mrs. Jennifer Cruickshank-Howard (Chief Fisheries Officer, St. Vincent and the Grenadines), along with Dr. Susan Singh-Renton (Deputy Executive Director of the Caribbean Regional Fisheries Mechanism Secretariat), and Megapesca Consultants Dr. Ian Goulding and Dr. Christine Froese.

Credit: Megapesca Lda. Portugal

Press release No. 3

Caribbean Regional Fisheries Mechanism successfully implements EU funded project helping to strengthen sanitary controls in the CARIFORUM fishery sector

The Caribbean Regional Fisheries Mechanism (CRFM), in partnership with the Inter-American Institute for Cooperation on Agriculture has successfully completed the project "Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade". The project which started in September 2016, was funded under the EU's 10th EDF Sanitary and Phytosanitary Measures Project and delivered with the help of a team of consultants from Megapesca in Portugal. The aim was to continue to help CARIFORUM countries to improve the safety of fish and fishery products for consumers in national and export markets, and several activities

The project prepared six new manuals to help fish inspectors apply the best international practices to the inspection of fishing vessels, processing establishments and aquaculture facilities. The subjects covered include HACCP, traceability, and for the first time, a compendium of food safety hazards encountered in Caribbean fishery products. In addition, the project has prepared two manuals for laboratories, on the testing of fishery products to make sure they are safe, and ensuring that laboratory test results are accurate. The manuals will be distributed by the CRFM and will soon be available online (http://www.crfm.int/) not only in English, but in Spanish, French and Dutch language versions as well.

The project also delivered two weeks of training, based on the manuals, and covering "Food safety in the fishery sector" and "Fishery products laboratory testing", which were delivered to 30 inspectors and laboratory analysts from 15 CARIFORUM countries and the Caribbean Agricultural Health and Food Safety Agency. The training took place in St. Vincent and the Grenadines, during the period 28th November to 9th December 2016, conducted by four international experts in inspection, control and testing in the fishery sector. The training course covered food safety hazards, best international practices in fish inspection at each stage of the supply chain, controls in aquaculture, and traceability as well as modern approaches to laboratory testing and accreditation. Particular attention was paid to explaining the sanitary requirements for exporting fishery and aquaculture products to the EU and other developed country markets. Practical work helped the participants to understand the role of rapid and field testing to allow better decisions to be made about the safety of fishery products. At the end of the course the equipment used, such as water quality test kits and thermometers, was donated to the participants on behalf of their employing authority. All the training sessions were video recorded and uploaded to the CRFM site, and along with the manuals, these will provide a valuable and lasting training resource for the region.

As well as these two major outputs, the project has also helped the CRFM to develop a set of impact assessment indicators and a methodology, to provide an objective approach to the monitoring of progress in the strengthening of fishery sector sanitary controls. This suite of indicators is based both on published data and questionnaire surveys of Competent Authorities and testing laboratories, and the project benchmarked these to December 2016. The results provide a useful snapshot of the current status of the control systems in the region, and future replication of the study will provide a measure of progress made as the region's Governments move forward in building stronger sanitary control systems to improve public health and trade performance related to food in general, and fishery products in particular. An infographic, which provides an interactive map illustrating the nature and extent of fishery sector sanitary controls applied in the region was also developed and is also available via the CRFM website.

CRFM's Project Coordinator, Dr. Susan Singh-Renton, Deputy Executive Director of the Caribbean Regional Fisheries Mechanism Secretariat welcomed the successful completion of the project saying that

“Capacity to achieve international standards in safety of fishery products has been a major area of weakness impacting the full realization of economic benefits for fishing industries in CARIFORUM States, particularly the earnings from exports. In this regard, the project's contribution has been a crucial one, through development of two training courses and eight operational manuals suitable for use by food safety laboratory experts and fish product inspectors within the CARIFORUM region. Though the project has ended, the manuals, course video, and impact assessment tools will continue to be useful reference products for all industry stakeholders striving for the same goals in fisheries food safety.”

Information for editors

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The EU project “10th EDF Sanitary and Phytosanitary Measures Project” has the expected result that capacities will be strengthened at the national and regional levels for health and food safety requirements of fisheries and aquaculture (inland, marine) products which will also ensure safe food standards for fisheries products in the region, while meeting the requirements of the region's trading partners worldwide.

Photo Caption: Unloading small pelagic fish in Kingstown, St. Vincent and the Grenadines
Credit: Megapesca Lda. Portugal

The CRFM is an inter-governmental organisation whose mission is to "Promote and facilitate the responsible utilisation of the region's fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region". The CRFM consists of three bodies – the Ministerial Council, the Caribbean Fisheries Forum and the CRFM Secretariat.

CRFM members are Anguilla, Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago and the Turks and Caicos Islands.

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