Food and Agriculture Organization of the United Nations

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Centre for Environment Fisheries & Aquaculture Science

World Class Science for the Marine and Freshwater Environment

FAO Reference Centre for Bivalve Mollusc Sanitation

Joint Cefas - FAO Virtual Regional Workshop on Bivalve Mollusc Sanitation for Latin America and the Caribbean

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Foreword

This document summarises relevant information from the virtual workshop hosted by the FAO Fisheries Division and Cefas as the FAO Reference Centre for Bivalve Mollusc Sanitation using virtual conferencing technology on 2nd – 4th November 2021. It includes the workshop agenda, delegate list, workshop minutes, feedback scores and comments from the delegates.

Dr Rachel Hartnell

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Delegate List

Country	Delegate	Organisation
Antigua and Barbuda	Larique Hackshaw	Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs
Argentina	Marcela Alejandra Alvarez	Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental
Argentina	Noelia Mariel Uyua	Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental
Argentina	Melillan Patricia Leonor	Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental
Argentina	German Marino	Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental
Argentina	Diego Saban	Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental
Argentina	Emiliano Crippa	Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental
Argentina	Luz Alianelli	SENANSA, Servicio Nacional de Sanidad y Calidad Agroalimentaria
Argentina	Gaston Gutierrez	Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental
Argentina	Maria Belén Mattera Coy	INIDEP (National Institute of Fisheries Research and Development) Mar del Plata.
Brazil	Fabio Expedito dos Santos Neto	Secretariat of Aquaculture and Fisheries – Ministry of Agriculture, Livestock and Supply Brazilian Government
Brazil	Renata Silveira	Secretariat of Aquaculture and Fisheries – Ministry of Agriculture, Livestock and Supply Brazilian Government
Brazil	Robson Ventura de Souza	Secretariat of Aquaculture and Fisheries – Ministry of Agriculture, Livestock and Supply Brazilian Government
Country	**Delegate**	**Organisation**

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Brazil	Winnie Muniz Brum	Secretariat of Aquaculture and Fisheries – Ministry of Agriculture, Livestock and Supply Brazilian Government
Chile	Ítalo Vergara	Servicio Nacional de Pesca y Acuicultura
Chile	Rodrigo Dougnac	Servicio Nacional de Pesca y Acuicultura
Chile	Patricio González	Servicio Nacional de Pesca y Acuicultura
Chile	Marcela Caamaño	Servicio Nacional de Pesca y Acuicultura
Chile	Ana María Abarzua	Servicio Nacional de Pesca y Acuicultura
Chile	Evelyn Niño	Servicio Nacional de Pesca y Acuicultura
Chile	Cristian Jara	Servicio Nacional de Pesca y Acuicultura
Chile	Rocío Mejías	Servicio Nacional de Pesca y Acuicultura
Chile	Claudio Durán	Servicio Nacional de Pesca y Acuicultura
Chile	Alejandro Barrientos Puga	Subsecretaría de Pesca y Acuicultura
Chile	Paulina Vera	Subsecretaría de Pesca y Acuicultura
Chile	María Loreto Gaviño	Subsecretaría de Pesca y Acuicultura
Chile	Daniel Segura	Subsecretaría de Pesca y Acuicultura
Chile	Cecilia Perez	Subsecretaría de Pesca y Acuicultura
Chile	Carolina Molina	Subsecretaría de Pesca y Acuicultura
Chile	Cristián Acevedo	Subsecretaría de Pesca y Acuicultura
Colombia	Diego Armando Ortiz Ortega	Autoridad Nacional de Acuicultura y Pesca AUNAP
Colombia	Omar Olimpo Ortiz Ferrin	Autoridad Nacional de Acuicultura y Pesca AUNAP
Dominica	Kurt Hilton	Ministry of Agriculture and Fisheries, Dominica
Panama	Zedna Ibis Guerra	Direcciòn de Investigación y Desarrollo, Estaciòn de Maricultura del Pacìfico de la Autoridad de los Recursos Acuáticos de Panamá (ARAP)
Mexico	Alejandro Méndez Hernández	Deputy Director of Aquaculture and Mariculture
Country	**Delegate**	**Organisation**
Mexico	Noemi Itzel Zamora García	Head of the Fisheries Standards Development Department

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Mexico	Ana Uribe Prado	General Direction of Organization and Promotion
Mexico	Gabriela Escobar	Not stated
St Vincent and the Grenadines	Ms. Cylena Andrews	Fisheries Division
St Vincent and the Grenadines	Delight Olivierre	Fisheries Division
Suriname	Mr. Zojindra Arjune	Ministry of Agriculture, Animal Husbandry and Fisheries
Suriname	Mr. Deepak Budhoo	Ministry of Agriculture, Animal Husbandry and Fisheries
Suriname	Mrs. Aarti Tedjoe	Ministry of Agriculture, Animal Husbandry and Fisheries
Suriname	Arisha Sital- Sewbaran	Ministry of Agriculture, Animal Husbandry and Fisheries
Suriname	Roshni Mohan	Ministry of Agriculture, Animal Husbandry and Fisheries
Suriname	Marjory Kromotaroeno	Ministry of Agriculture, Animal Husbandry and Fisheries
Suriname	Jaleesa Tomoredjo	Ministry of Agriculture, Animal Husbandry and Fisheries
Trinidad and Tobago	Mr Harnarine Lalla	Ministry of Agriculture, Land and Fisheries
Trinidad and Tobago	Ms Nadia Ramphal	Ministry of Agriculture, Land and Fisheries
Trinidad and Tobago	Mr Eustace Phillips	Ministry of Agriculture, Land and Fisheries
Trinidad and Tobago	Mr Brandon Dookie	Ministry of Agriculture, Land and Fisheries
Uruguay	Dr Jamie Coronel	Direccion Nacional de recursos Acuaticos,
Uruguay	Dra. Soledad Bello	Direccion Nacional de recursos Acuaticos,
Uruguay	Dr Gonzalo Crossi	Direccion Nacional de recursos Acuaticos,
Uruguay	Lic. Eugenia Errico	Direccion Nacional de recursos Acuaticos,
Uruguay	Lucila Silva	Direccion Nacional de recursos Acuaticos,
Uruguay	Sabrina La Torre	Direccion Nacional de recursos Acuaticos,
FAO	Esther Garrido Gamarro	FAO Fisheries Division
Country	**Delegate**	**Organisation**

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FAO	Giulia Loi	FAO Fisheries Division
FAO	Florence Faivre	FAO Fisheries Division
FAO	Dr. Iddya Karunasagar	FAO Invited Technical Expert (Nitte University)
UK	Rachel Hartnell	Food and Agriculture Organisation Reference Centre, Cefas
UK	Craig Baker-Austin	Food and Agriculture Organisation Reference Centre, Cefas
UK	James Lowther	Food and Agriculture Organisation Reference Centre, Cefas
UK	Michelle Price-Hayward	Food and Agriculture Organisation Reference Centre, Cefas
UK	Louise Stockley	Food and Agriculture Organisation Reference Centre, Cefas
UK	Andrew Turner	Food and Agriculture Organisation Reference Centre, Cefas
UK	Andrew Younger	Food and Agriculture Organisation Reference Centre, Cefas
UK	Ben Maskrey	Food and Agriculture Organisation Reference Centre, Cefas
UK	Megan Pring	Food and Agriculture Organisation Reference Centre, Cefas

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Virtual Regional Workshop on Bivalve Mollusc Sanitation for FAO Latin America and the Caribbean Region

Agenda

Dates: 2nd, 3rd and 4th November 2021
Virtual meeting platform: Zoom

Timings (approximate): Rome time - Start time –15:00 2nd November
End time – 18:00 4th November

Language: English and Spanish

Day one – 2nd November 2021, 15:00 – 18:00 – chair – Rachel Hartnell

https://fao.zoom.us/meeting/register/tJItcOmrrjwqHd1IuULeA-jOqxXgDd83nBiI

- Welcome and opening address from the FAO (10 -15 min) [Esther Garrido Gamarro] 15:00 - 15:15
- Global importance of bivalve molluscs as a safe, sustainable foodstuff (15 min) [Rachel Hartnell] 15:15 – 15:30
- Workshop participants' existing and planned bivalve mollusc production [participants – approx. 5 mins each]
    a. Antigua and Barbuda, *Larique Hackshaw*, 15:30 -15:35
    b. Argentina, *Marcela Alejandra Alvarez*, 15:35 -15:40
    c. Brazil, *Fabio Expedito dos Santos Neto*, 15:40 -15:45
    d. Chile, *Rodrigo Dougnac Figueroa, Alejandro Barrientos Puga* 15:45 – 15:50
    e. Dominica, Kurt Hilton, 15:50 – 15:55
- *Break (10 -15 min)*
- Workshop participants' existing and planned bivalve mollusc production continued [participants – approx. 5 mins each]
    a. Colombia, *Diego Armando Ortiz Ortega*,16:10 - 16:15
    b. Mexico, *Alejandro Méndez Hernández,* 16:15 – 16:20
    c. Panama, *Zedna Ibis Guerra*, 16:20 - 16:25
    d. Suriname, *Mr. Zojindra Arjune*, 16:25 – 16:30
    e. Trinidad and Tobago, *Mr Harnarine Lalla*, 16:30 – 16:35
    f. Uruguay, *Dr Jamie Coronel*, 16:35 – 16:40
    g. St Vincent and the Grenadines, *Ms Delight Olivierre*, 16:40 – 16:45

- *Break (10 min) 16:45 -16:55*
- Codex standards, code of practice and guidelines for live and raw bivalve molluscs and a brief introduction to the FAO/WHO Technical Guidance (20 mins) [Iddya Karunasagar] 16:55 – 17:15
- Workshop aims (5 min) [Rachel Hartnell] 17:15 – 17:20

CLOSE DAY ONE

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Day two – 3rd November 2021, 15:00 – 18:00 – chair – Andrew Younger

https://fao.zoom.us/meeting/register/tJItcOmrrjwqHd1IuULeA-jOqxXgDd83nBiI

- Major microbiological hazards associated with bivalve mollusc consumption (30 min) [James Lowther/Craig Baker-Austin] 15:00 – 15:30
- Major biotoxin and contaminant hazards associated with bivalve mollusc growing areas (20 min) [Andy Turner] 15:30 – 15:50
- Break out session 1 – Food borne illness associated with bivalve molluscs – scenario (60 min) [All]
- *Break (10 min)*
- Growing Area Risk Profile (GARP) and Risk Assessments (GAA) – (30 min) [Michelle Price Hayward/Andrew Younger] 17:00 -17:30
- Biotoxin Monitoring Methods (20 min) Andy Turner 17:30 -17:50

CLOSE DAY TWO

Day three – 4th November 2021, 15:00 – 18:00 – chair – Rachel Hartnell

https://fao.zoom.us/meeting/register/tJItcOmrrjwqHd1IuULeA-jOqxXgDd83nBiI

- Break out session 2 – Growing Area Assessment – a 'virtual' assessment of potential growing area (20 min) [All]
- Growing Area Monitoring and Classification (20 min) [Andy Younger] 15:20 – 15:40
- Sampling and laboratory capability, capacity, and quality assurance (30 min) [Louise Stockley] 15:40 – 16:10
- Break out session 3 - Data management and assessment (20 min) [All]
- *Break (10 min)*
- Website, sources of information and opportunities to work with FAO and FAO Reference Centre (20 min) [Rachel Hartnell/Esther Garrido Gamarro] 16:40 – 17:00
- Plenary, bivalve molluscs quiz and participants questions and answers session (30 min) [Rachel Hartnell] 17:00 – 17:30
- FAO closing address (10 min) [Esther Garrido Gamarro]

CLOSE DAY THREE

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Minutes of the Virtual Regional Workshop on Bivalve Mollusc Sanitation for the FAO Latin American and the Caribbean region, 2nd – 4th November 2021

Welcome and opening address

Dr Esther Garrido Gamarro (EGG) of the FAO Fisheries division welcomed delegates to the virtual workshop and laid out the technical arrangements for participation. She then outlined the context for the establishment of the FAO Reference Centre (RC) for Bivalve Mollusc Sanitation, highlighting the large potential for expanding bivalve mollusc production in many coastal countries around the world, alongside the particular challenges around international trade, given the ability of bivalves to concentrate contaminants from their growing waters.

Introduction to the workshop and global importance of bivalve molluscs as a safe, sustainable foodstuff

Dr Rachel Hartnell (RH), director of the FAO RC provided information on Cefas, as the organisation designated as the RC, including an overview of its international activities in a diverse range of countries around the globe. She further explained the importance of seafood in general and bivalves in particular, in terms of helping to provide a sustainable and healthy source of food for the global population, whilst highlighting the various challenges in providing bivalves that are safe to eat, and to international trade in this commodity.

Presentations from participating countries

A series of presentations were given by representatives of nine participating countries from the Latin America and the Caribbean region, Marcela Alejandra Alvarez (Universidad Nacional de Moreno, Coordinación de Licenciatura en Gestion Ambiental, ARGENTINA), Robson Ventura de Souza (Secretariat of Aquaculture and Fisheries – Ministry of Agriculture, Livestock and Supply Brazilian Government, BRAZIL), Rodrigo Dougnac Figueroa (Servicio Nacional de Pesca y Acuicultura, CHILE), Diego Armando Ortiz Ortega (Autoridad Nacional de Acuicultura y Pesca AUNAP, Colombia), Zedna Ibis Guerra (Direcciòn de Investigación y Desarrollo, Estaciòn de Maricultura del Pacìfico de la Autoridad de los Recursos Acuáticos de Panamá (ARAP) PANAMA), Ana Uribe (Deputy Director of Aquaculture and Mariculture, MEXICO), Ms Delight Olivierre (Fisheries division, ST VINCENT AND THE GRENADINES), Mr. Zojindra Arjune (Ministry of Agriculture, Animal Husbandry and Fisheries, SURINAME), Mr Harnarine Lalla (Ministry of Agriculture, Land and Fisheries, TRINIDAD AND TOBAGO) and Dr Jamie Coronel (Direccion Nacional de recursos Acuaticos, URUGUAY). In each case the representative provided an overview of bivalve production, official controls, and trade within their country, alongside the national ambitions for further development of the sector. Within Latin America and the Caribbean there was a very wide variety within the bivalve production sectors; in some countries production levels were large, supported by extensive and well-developed national control programmes, and in some cases, there was considerable international export trade in bivalves. At the other extreme, delegate countries from the region have no current bivalve production but believe there is considerable potential for developing this area.

Overview of the FAO/WHO Technical Guidance

Prof. Iddya Karunasagar of Nitte University, India (formerly of the FAO Fisheries Division) outlined the development and publication of the FAO/WHO Technical Guidance for the Development of the Growing Area Aspects of Bivalve Mollusc Sanitation Programmes, which has recently been updated.

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This document was produced by an international working group of experts in the field (including Prof. Karunasagar) under a mandate to develop detailed guidance within the framework within Section 7 of the Codex Code of Practice for Fish and Fishery Products, with the aim of facilitating the implementation of national Bivalve Sanitation programmes. Prof. Karunasagar further provided an overview of the contents of the guidance (covered in more detail in subsequent presentations).

Aims of the workshop

RH introduced the workshop agenda and outlined the central aim of the workshop, namely, to help the delegate countries achieve **enhanced production of safe bivalve molluscs** through, in the short term, the provision of information on bivalve sanitation and, in the longer term, the formation of relationships between competent authorities and testing labs in the delegate countries and the Reference Centre and FAO Fisheries Division**.**

Major microbiological hazards associated with bivalve mollusc consumption

Dr James Lowther (JL) of the FAO RC provided information on the main hazards associated with bivalves, with particular emphasis on microbiological hazards including *Salmonella* spp., *Vibrio* spp., norovirus and hepatitis A virus, plus emerging hazards including hepatitis E virus and tetrodotoxin. Evidence of the occurrence of these pathogens in Latin America and the Caribbean, in shellfish-linked outbreaks, passive surveillance of retail shellfish and the wider population was presented. The potential of contaminated shellfish to cause significant outbreaks of illness in consumers, as exemplified by the largest ever recorded shellfish-related outbreak (amongst 300,000 cases of hepatitis A virus linked to consumption of clams in China) was outlined. The need to assess the potential contribution of different hazards as part of the Growing Area Risk Profile (GARP) was presented, as was the possibility of including a hazard survey (direct testing of shellfish or water samples for pathogens) as part of the Growing Area Assessment (GAA). Brief details of the technical requirements of the testing methods, with particular focus on methods for viruses were provided.

Major biotoxin and contaminant hazards associated with bivalve mollusc growing areas

Dr Andrew Turner (AT) of the FAO RC provided information on the main biotoxin-associated hazards relevant to bivalves. He introduced the production of harmful toxins by a range of algal species, and described their impacts on human, animal and ecosystem health. The three main regulated toxin groups (paralytic shellfish poisoning (PSP), amnesic shellfish poisoning (ASP) and lipophilic toxins) were described in detail, including their chemistries, modes of action and information on global distribution with a specific focus on the Latin American and Caribbean regions. The talk concluded with an overview of emerging toxin hazards which may impact on seafood safety, including tetrodotoxins, palytoxins, cyanotoxins, brevetoxins and pinnatoxins.

Break out session one – Food borne illness associated with bivalve molluscs

The delegates were divided into four groups of around 10-14 each, then provided with a scenario detailing either a biotoxins or a microbiological outbreak. Each group were headed by a Cefas facilitator with expertise in the relevant field. The groups were led through a guided discussion after receiving two packs of documents that contained fictional data and/or paperwork similar to that the competent authority would have received in a real outbreak situation. Group members were able to ask questions of the facilitator, and the facilitator in turn asked the group members questions to

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instigate discussion around appropriate actions for the competent authority in the fictional outbreak scenarios, both at early stages when information is scarce, and later as more information accumulates.

Overview of Growing Area Risk Profile and Growing Area Assessment
Michelle Price-Hayward (MPH) and Andy Younger (AY) of the FAO RC provided an introduction to the concept and stages of the GARP as described in the FAO/WHO Technical Guidance. The GARP is the initial information gathering stage of the assessment of a newly proposed bivalve production area; the bases for making the decision to proceed to a full assessment were described. The presentation further covered the requirements for a full GAA of a new production area, as described in the FAO/WHO Technical Guidance. This is a more in-depth procedure than the GARP, involving a more through collection of information, plus the generation of new data through shoreline and hazard/indicator surveys. The different types of data analysis (descriptive/semi-quantitative/quantitative) were described, and the outcome, in terms of accurate mapping of the proposed area, and a primary monitoring plan including defined sampling points was explained.

Biotoxin monitoring methods
AT described the processes used for regulatory official control testing of bivalve molluscs for marine biotoxins in the United Kingdom and the European Union. Information was provided in relation to monitoring of water for phytoplankton and the actions taken following exceedance of threshold levels. An overview was then provided in relation to the technologies used for monitoring marine toxins in shellfish, before presenting specific information on methods utilised for each of the three regulated toxin groups. The presentation concluded with information on validation of methods and requirements for accreditation and associated quality assurance measures.

Break out session two – A 'virtual' assessment of a potential growing area
The delegates were split into the same four groups again, each led by the same Cefas facilitator, and walked through a cartoon slide show that simulated possible hazards associated with a hypothetical new production area subject to a growing area assessment. Cefas facilitators gave the delegates a short amount of time to partake in some thought around what may or may not be a hazard. The delegates then took part in a discussion led by Cefas facilitators, in which they discussed why certain hazards may pose a risk to the shellfish beds.

Growing area monitoring and classification
AY explained the need for both primary and ongoing monitoring (using microbiological testing) of bivalve production areas, and the principles of classification (particularly the distinction between areas where bivalves are judged fit for consumption raw without the need for treatment after collection, and areas where treatment is required). The different benefits of monitoring using indicator organisms or pathogens, and shellfish flesh or water samples were detailed. The different choices in designing a monitoring and classification system were illustrated with reference to the United States (US) and European Union (EU) systems. Requirements for conditional classifications and the use of buffer zones around point sources of contamination were explained.

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Break out session three – Data management and assessment
Delegates entered breakout groups for a final time where Cefas facilitators led them through a data analysis scenario. The delegates were provided with two theoretical sets of *E. coli* monitoring data and asked to classify the associated sites using the EU classification rules.

Sample collection, transport, analysis and quality of test results
Louise Stockley (LS) of the FAO RC provided an overview on the requirements for sample collection, transport, and analysis, in order to guarantee high quality information is used for monitoring and classification. The requirement for fixed protocols for sample collection, submission, testing and reporting of results was explained. Technical details on reference and alternative methods for the indicator organisms *E. coli* and FRNA bacteriophage were given. Finally, the value of laboratory accreditation and regular proficiency testing in guaranteeing the quality of test results was demonstrated.

Mechanisms to request technical assistance
EGG explained the principal mechanisms available to member countries to access technical assistance from the FAO. One of them is assistance through a Technical Cooperation Programme, which enables FAO to make its know-how and technical expertise available to member countries upon request, drawing from FAO's own resources. It provides assistance in all the technical areas pertaining to FAO's mandate and competence in line with FAO's Strategic Framework and the priority needs as expressed in the Country Programming Frameworks (CPFs) that are agreed with national governments. Other category are Trust Fund Projects, where the bulk of FAO's Trust Funds fall under the Government Cooperative Programme (GCP) and the Unilateral Trust Funds (UTFs) categories. However, there is a broader range of different funding modalities and the flexibility of developing new ones in accordance with donors' and developing countries' needs and priorities.

The following briefly describes the GCP and UTF categories.
(a) Government Cooperative Programme (GCP)
A GCP is an agreement between three parties: FAO, one or several donors/financing institutions and the beneficiary country or countries. It is a financing modality for donor governments or financing institutions to entrust funds to FAO for the provision of technical assistance services to a specific developing country, a group of countries within a specific region (regional project) or a group of countries in different regions (an interregional project). It is among the largest of the FAO Trust Fund programmes.
(b) Unilateral Trust Fund (UTF)
A UTF is a funding modality for projects financed by a government for the benefit of its own country and benefiting from the technical expertise of FAO. It is fully funded by the beneficiary country from national resources or from loans, credits and grants made available by international financing institutions or bilateral donors. Many countries have used this type of FAO Trust Fund.

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Introduction to the role of the FAO Reference Centre for Bivalve Shellfish Sanitation, and overview of online resources including e-Learning

RH summarised the roles and responsibilities of the FAO RC, and provided delegates with an overview of the range of information currently available through the website of the RC (https://www.cefas.co.uk/faobivalves) including protocols and technical guidance, information and contact details for RC staff and in particular links to eLearning modules on bivalve sanitation developed in collaboration with the FAO eLearning academy (two modules available currently with more in development).

Quiz

Immediately before the close of the meeting, the delegates were invited to take part in a virtual multiple-choice quiz to test their knowledge of the topics covered in the workshop.

Closing

The meeting concluded with EGG and RH summarising the workshop activities across the three days and thanking the delegates for their attendance and engagement with the FAO Fisheries Division and FAO RC in helping to ensure a successful virtual workshop.

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FAO RC responses to "chat" questions from workshop delegates

During the meeting, delegates were encouraged to submit questions using the online chat function. These questions are listed here, with responses prepared by the FAO RC.

How does the presence of pathogens in regular monitoring (e.g. *Vibrio parahaemolyticus*, norovirus, etc.) affect the classification, according to the EU criterion, when the indicator monitoring is consistent with category A status.

Although there is relatively poor correlation between *E. coli* (the faecal indicator used in EU programmes) and norovirus presence in individual bivalve shellfish samples, site-based monitoring using *E. coli* as an indicator of the likely presence of enteric pathogens (e.g., norovirus or *Salmonella*) is generally effective, with closer correlations observed as faecal contamination increases. Therefore, a well-designed sanitation programme based upon *E. coli* will provide a level of public health protection. However, in cleaner sites where faecal contamination, and thus norovirus, is sporadic, faecal indicators may be less predictive, due to the nature of the contamination event, the timing or frequency of sampling, and the differences in behaviour between faecal indicator bacteria and viruses in both the environment and in shellfish.

In the EU there are currently no microbiological criterion for norovirus although Food Business Operators (FBO) may include virus testing within their Hazard Analysis and Critical Control Point (HACCP) plans. In some places Competent Authorities may introduce restrictions on harvesting such as short-term closures, or require enhanced treatment following association of norovirus with a growing area e.g. following an outbreak report or following a notification of virus detection. Detection of norovirus in a growing area may trigger such action however in the EU classification programmes are exclusively based on assessment of (usually) time series *E. coli* data. Thus, the detection of norovirus in a growing area would not impact the classification but may impact actions taken after monitoring. The precautionary principle identified in Regulation (EC) No. 178/2002 should be applied to all foods.

Equally in EU legislation there are no microbiological criteria for *V. parahaemolyticus* although again this potential pathogen may be included in FBO HACCP plans. *V. parahaemolyticus* is not associated with faecal contamination of growing areas, it is a widespread marine bacterium with abundance usually related to water temperatures and low salinity. Its presence in a growing area would not affect the classification of an area under the EU system but the precautionary principle identified above should be applied if it is considered that there is an elevated public health risk.

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Would class B require relay or depuration?

Either is acceptable under the EU regulations

How long would the relay in a class A area be necessary?

One month from class B; 2 months from class C.

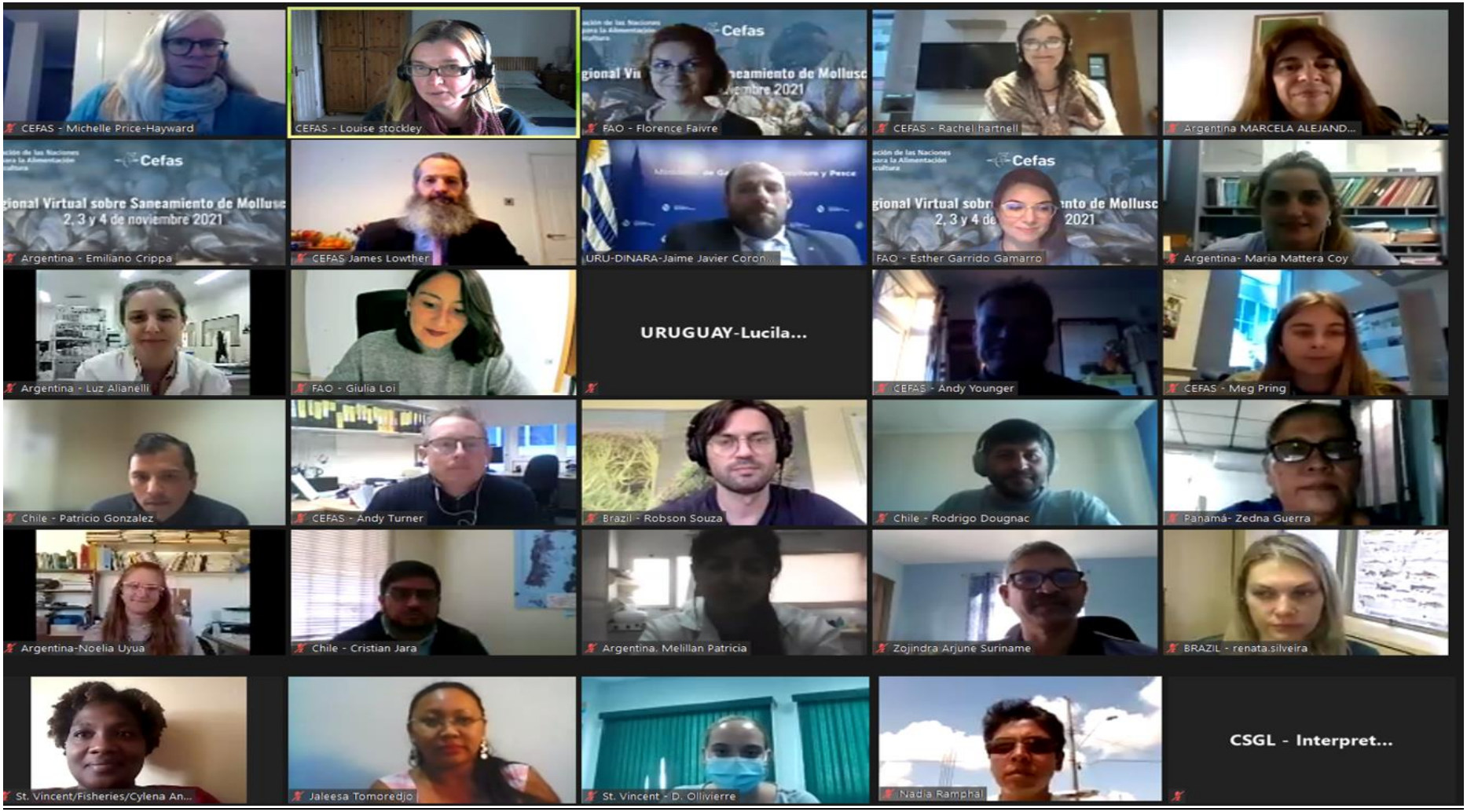
If there were multiple monitoring points in an area and they gave biotoxin monitoring levels spanning the EU limits, how would one deal with interpretation and status of the area?

From a United Kingdom perspective, where the same rules as those used in the EU are retained in legislation, there is only one biotoxin monitoring point (Representative Monitoring Point – RMP) per production area (PA) or Pod.
In English & Welsh PAs, the RMP is selected based on historic toxin occurrence/primary harvested species and also geographic relevance. If the RMP records a result above the Maximum permitted level (MPL) then the whole PA and all species would be required to close. For areas which have a long history of toxin issues, there may be more than one point but the whole PA and all species would still close based on the result of any single point. In a few other cases where the PAs are either large or intricate and there are multiple monitoring points, these PAs have subdivided closure areas but all species within the defined subdivided area would close.
In Scotland a Pod system is used with one RMP per Pod – if the RMP records a result above the MPL then the whole Pod and all species within close. The Competent Authority also have a defined mechanism called the 'challenge mechanism' whereby a harvester can provide additional end product testing information from a site which isn't the RMP, demonstrating that they might get a different result from the RMP. If the Competent Authority agree, the site can be added as an additional RMP for the period of the Pod closure. If results are favourable from the additional site it may be able to open sooner than the rest of the Pod.

Is there a way to integrate in the classification system to include the other contaminants? (biotoxins, chemicals etc.)

Where RMPs can be demonstrated to be representative of other hazards (e.g., biotoxins) then these can be shared and this is the case in several places, however the monitoring frequency for sanitary classification of growing areas, biotoxin monitoring and chemical contaminant testing may differ so needs to be considered.

The FAO Reference Centre for Bivalve Mollusc Sanitation is funded by the United Kingdom Department of Food, Environment and Rural Affairs (Defra) and the United Kingdom Food Standards Agency.



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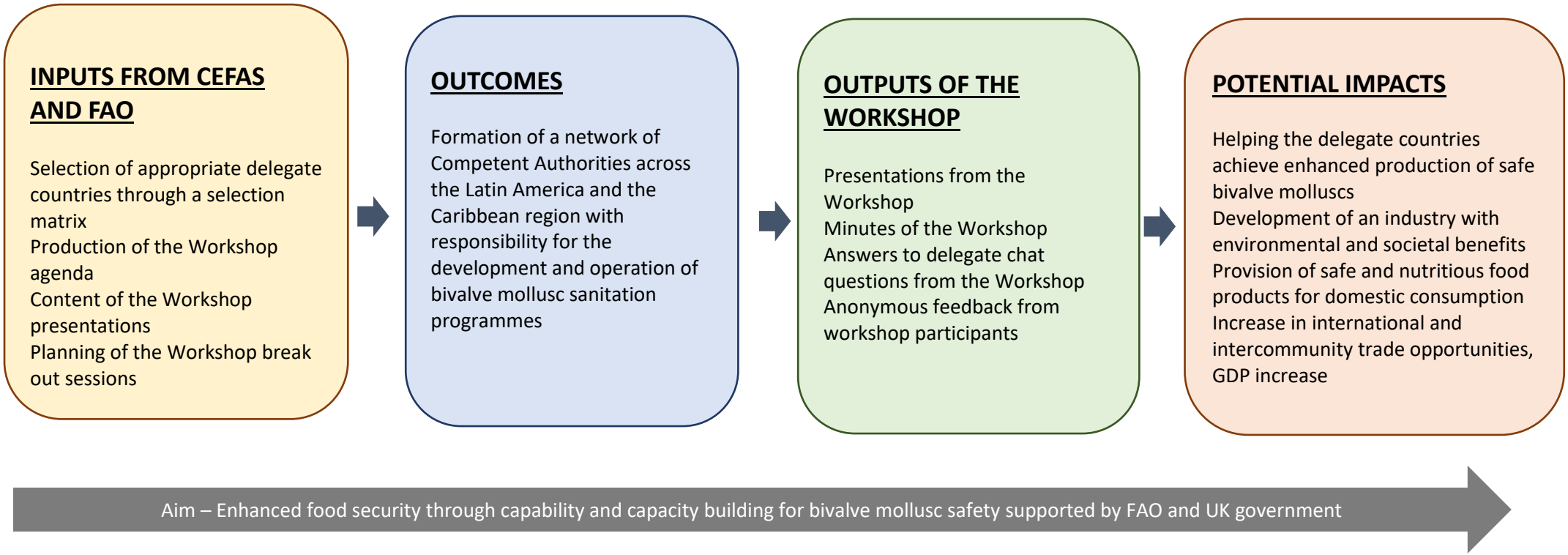
Benefits and impact assessment – Joint FAO-Cefas virtual regional workshop on Bivalve Mollusc Sanitation for Latin America and the Caribbean



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Food and Agriculture Organization of the United Nations

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- other scientists from research councils, universities and EU research programmes.
- NGOs interested in marine and freshwater.
- local communities and voluntary groups, active in protecting the coastal, marine and freshwater environments.

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