Advanced Course

INNOVATIVE TOOLS AND METHODS FOR ENSURING SEAFOOD AUTHENTICITY

Zaragoza (Spain), 8-12 June 2020

1. Objective of the course

Seafood is among the most internationally traded food commodities worldwide and it is one of the food groups most likely to face challenges around authenticity. This is due to the complex nature of the globalized seafood supply chain and the economic motivation to provide lower cost products from fisheries and aquaculture. The cost of food fraud to the overall global food industry is estimated at around 30 billion euro, which threatens the sustainability of supply chains.

To ensure sustainability and to meet the current demands of the global seafood marketing chain to combat fraud, an effective science-based traceability system must be able to identify species and the geographical origin, and to distinguish between wild-capture and farmed products. The system must also be able to identify fresh and frozen products, and the many different forms of processed seafood that are currently traded.

The objective of the course is to introduce participants to innovative tools and methods for ensuring seafood authenticity. By the end of the course, participants will:

- Recognize the importance of fraud in the seafood sector and the economic, environmental and public health impacts.
- Be familiar with the regulatory requirements for combatting seafood fraud and current European initiatives that are tackling this issue.
- Have gained experience in the process of conducting Food Fraud Vulnerability Assessments and developing Food Fraud Mitigation Plans.
- Have an increased knowledge of the most relevant and innovative methods for the identification of species and the geographic origin, the method of production and other authentication issues.
- Have gained experience in the use of in silico DNA sequencing analysis for species identification with public databases.
- Have skills in the use of rapid and on-site DNA methods for seafood authentication.
- Understand the importance of traceability tools in combating fraud based on actual value chain case studies.
- Have insights into emerging issues and future developments in the context of seafood fraud.

2. Organization

The course is jointly organized by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (IAMZ), the SEA-TRACES project funded by the European programme INTERREG Atlantic Area, and the Food and Agriculture Organization of the United Nations (FAO), through the Fisheries and Aquaculture Department. The course will take place at the Mediterranean Agronomic Institute of Zaragoza and will be given by well qualified lecturers from international organizations, research centres and universities in different countries.

The course will be held over a period of one week, from 8 to 12 June 2020, in morning and afternoon sessions.

3. Admission

The course is designed for 25 participants with a university degree, and is aimed at professionals within public institutions and the seafood industry, such as members of the competent authorities for official controls, seafood safety and quality managers, private labs, technical advisors and professionals from R&D institutions dealing with seafood control and management.

Given the diverse nationalities of the lecturers, knowledge of English, French or Spanish will be valued in the selection of candidates, since they will be the working languages of the course. The Organization will provide simultaneous interpretation of the lectures in these three languages.

4. Registration

Candidates must apply online at the following address:

Applications must include the curriculum vitae and copy of the supporting documents most related to the subject of the course.

The deadline for the submission of applications is 25 March 2020. The deadline may be extended for candidates not requiring a visa and not applying for a grant if there are free places available.

Applications from those candidates requiring authorization to attend the course, may be accepted provisionally.

Registration fees for the course amount to 500 euro. This sum covers tuition fees only.
5. Financial support

Candidates from CIHEAM member countries (Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Turkey), from other European countries and from other FAO member countries may apply for financial support to cover registration fees, travel and full board accommodation.

Candidates from other countries who require financial support should apply directly to other national or international institutions.

6. Insurance

It is compulsory for participants to have medical insurance valid for Spain. Proof of insurance cover must be given at the beginning of the course. Those who so wish may participate in a collective insurance policy taken out by the Organization, upon payment of the stipulated sum.

7. Teaching organization

The course requires personal work and interaction among participants and with lecturers. The international characteristics of the course favour the exchange of experiences and points of view.

The programme includes applied examples, real case studies and the exchange of experiences and points of view.

8. Programme

1. Global seafood trade (1 hour)
   1.1. Production – fisheries and aquaculture data
   1.2. Trade – imports/exports (species, utilisation, product forms)
   1.3. The importance of seafood consumption (diet, nutrition and health)

2. Food fraud in the seafood value chain (2 hours)
   2.1. What is food fraud? Examples of fraud in the seafood chain: authenticity of species, geographic area of origin, method of production, quality (water addition, additives, etc.)
   2.2. Vulnerability of the seafood value chain to fraud
   2.3. Economic, public health and environmental impacts of seafood fraud (financial losses to industry, reputation damages, consumer confidence, food safety issues, IUU fisheries and fish stocks)

3. Ensuring seafood authenticity (2 hours)
   3.1. Regulatory requirements of major seafood markets especially for traceability and labelling (EU, US, China, others)
   3.2. Industry codes of practice (IFS, BRC, GFSI, others)
   3.3. Codex Alimentarius standards and guidelines
   3.4. Initiatives underway at national and international level (EU Food Fraud Network, Reference Centres for authenticity and integrity, JRC Knowledge Centres, EUROPOL/INTERPOL Operation OPSON, others)
   3.5. Implementation of Food Fraud Vulnerability Assessment (FFVA) and Food Fraud Mitigation Plan (FFMP)

4. Methods for ensuring seafood authenticity (10 hours)
   4.1. Methods for the identification of seafood species
      4.1.1. Methods based on protein analyses (MALDI-TOF, LC-MSn, others). Databases for proteins
      4.1.2. Methods based on DNA analyses
         4.1.2.1. DNA markers, PCR techniques and isothermal amplification
         4.1.2.2. DNA sequencing and databases
      4.2. Destructive methods for the identification of the geographic origin and method of production. Omics, SNPs and microbiota
   4.3. Non-destructive methods for the identification of the method of production (farmed vs wild fish) (NIR, NMR, others)
   4.4. Methods for other authentication issues (thawed, glazed, approved/unapproved additives, added water)
   4.5. Validation of analytical methods, reference material and general requirements for the competence of control laboratories
   4.6. Traceability and labelling to ensure seafood authenticity
      4.6.1. Traceability tools (KDE/CTE, GS1, Blockchain, FoodChain Lab, other IT tools)
      4.6.2. Smart labelling tools (barcodes, RFID, QR codes)

5. SEA-TRACES case studies (2 hours)
   5.1. Bay of Biscay anchovies (SNP methodology)
   5.2. Flat oysters in France (microsatellites)
   5.3. Fish “pescadeRias” (Apps and smart labels)
   5.4. Discussion

6. Open discussion: the future of the integrity of seafood value chains (1 hour)

7. Practical work (15 hours)
   7.1. Group work
      7.1.1. Analysis of seafood labelling in different products and countries
      7.1.2. Exercise to conduct FFVA and develop an FFMP for specific products
   7.2. Computer-based tools
      7.2.1. DNA analysis methods: sequencing
         7.2.1.1. From raw data to aligned sequence data
         7.2.1.2. Sequence analysis: analysis of homology using Genebank and Fishbol databases; distance methods; FISHFIT platform
      7.2.2. FoodChain Lab: the application of an IT tool for seafood traceability
   7.3. Utilization of rapid and on-site methods: qPCR, isothermal amplification by dipsticks

8. GUEST LECTURERS

M. CARRERA, CSIC-IIM, Vigo (Spain)
F. DENIS, Université Le Mans, Concarneau (France)
C. GONZÁLEZ SOTELO, CSIC-IIM, Vigo (Spain)
M. GOTTSCHALD, Federal Institute for Risk Assessment (BfR), Berlin (Germany)
I. OLABARRIETA, AZTI, Derio (Spain)
M.A. PARDO, AZTI, Derio (Spain)
A. REILLY, University College Dublin (Ireland)
J. RYDER, FAO, Rome (Italy)
U. SCHRÖDER, Max Rubner-Institut, Kiel (Germany)