

CIHEAM -MEDITERRANEAN AGRONOMIC INSTITUTE OF BARI-ITALY
INFORMATION MANAGEMENT / E-LEARNING DIVISION
ONLINE COURSE CURRICULA



Training for increased capacity
Online Courses

Title: Sustainable, resilient and climate friendly Blue Growth of EU Aquaculture and beyond

Type: Online

Date: From 15 June 2022 to 29 July 2022 facilitated learning (available for 12 months for self-learning)

Duration: 6 weeks

Location: CIHEAM Bari web-based platform

Website: <http://el.iamb.it/>

Background

FutureEuAqua is a Horizon 2020 project with 32 partners, kicked off in November 2018 and set to end in April 2023.

The overall objective of FutureEUAqua is to effectively promote the sustainable growth of climate-change resilient, environmentally friendly organic and conventional aquaculture of major fish species and low trophic level organisms in Europe, to meet future challenges with respect to the growing consumer demand for high quality, nutritious and responsibly produced food.

The European Green Deal and the Farm to Fork Strategy underline the potential of farmed seafood as a source of protein for food and feed with a low-carbon footprint which has an important role to play in helping to build a sustainable food system. The Farm to Fork Strategy also sets specific targets for aquaculture, in particular the reduction of sales of antimicrobials and a significant increase in organic aquaculture by 2030.

When the FutureEUAqua project started, aquaculture production in the EU had reached 1.25 million tonnes of seafood annually, with a value of over 4 billion euro. Of this amount, 4% was certified as organic, amounting in 2015 to a total of approximately 50,000 tonnes¹. In 2015, EU consumers spent 54 billion euro for buying fisheries and aquaculture products, reaching the highest amount ever recorded². Nevertheless, Europe was still heavily dependent on external markets to cover this demand. Thus, EU aquaculture need to increase the competitiveness of its products and respond to consumer demands for high-quality and safe food, in a challenging context of climate change, greater competition for natural resources, and conflicting interests for space and markets.

¹ EUMOFA, 2017b

² EUMOFA, 2017b

Organic production - mainly mussels, oysters, trout, salmon, carp, sea bass/seabream³ - had increased by 25% compared to 2012⁴. Nevertheless, significant bottlenecks present in organic farming needed to be overcome in order to maintain this positive trend.

To ensure food and nutrition security by 2030, the food production sectors have to sustainably expand in terms of space use, production and new value chains, exploring and enhancing innovation opportunities offered by sustainable and resilient aquaculture production systems, implementing the circular economy principles and increasing social acceptance of the corresponding activities and products.

European aquaculture, with a lower carbon footprint compared to cattle, pork and even poultry⁵, has the potential to effectively address these challenges and contribute positively to the implementation of the UN Sustainability Development Goals (SDGs) commitments.

Future aquaculture needs to manage production of high quality, safe food for a growing population, without harming the environment and without compromising animal health and welfare. To succeed, improvements are demanded along the whole value chain, i.e. from egg to fork.

For conventional and organic aquaculture, sustainable production requires smart breeding programs, feeds and production technologies that meet the requirements of the different farmed aquatic species. To minimise climate impacts, feed ingredients from low trophic levels and circular economy are important.

The need for increased efficiency of space and resource use can be brilliantly approached by new technologies, both on land and in water, amongst others RAS (Recirculating Aquaculture Systems) and IMTA (Integrated Multitrophic Aquaculture). Moreover, conventional open cage production systems need to be managed smartly and significantly reduce their nutrient discharges, escapes and disease incidences.

In aquaculture lays great part of the food production sectors' responsibility to ensure food safety in the future without jeopardising the environment or the consumers' and animals' health and welfare.

More high-quality organic food products, low in undesirable compounds, packed in smart zero waster solutions, together with economic conventional seafood products with lower environmental footprint, produced by selected champion breeds for nutrient utilisation efficiency and robustness, grown responsibly and more effectively managed by non-invasive monitoring technologies are needed.

FutureEUAqua addressed these aspects and can bring future EU aquaculture to this end by promoting innovations in the whole value chain, including:

- **Sustainable breeding:** Assessing, validating and demonstrating the level of the ability of the current breeding programs, breeding goals and methodologies.
- **Ingredients & feed:** Ensuring sustainable and resilient production by focusing on high fish performance, health and product quality.
- **Production systems:** Documenting tailor-made fish perform in future cost-effective production systems that function optimally.
- **Quality & Safety:** Developing innovative high quality minimally processed fish products and related packaging conditions, in order to valorise aquaculture raw materials.
- **Monitoring technologies:** Monitoring the impact of housing environments and innovative diets on the fish health and welfare.
- **Consumer awareness:** Improving consumer awareness, perception and acceptance of European aquaculture products and methods.

³ EUMOFA, 2017a

⁴ Zubiaurre 2014

⁵ Sonesson et al. 2009

eLearning Purpose/Objective

This online course is aimed to convert/transform results and outputs into practical knowledge when implementing the innovative solution identified and developed within the project.

Content and Structure

This course is structured 1 Introductory, 3 thematic and 1 Recovery sessions, that will be released and implemented from 15 June 2022 **to 29 July 2022 for facilitated learning**. Instead for **self-learning**, the training program will be made for extra 12 months:

Module I: Innovative feeds and feeding strategies for improving welfare & performance of fish in sustainable and organic aquaculture (Elena Mente - Aristotle University of Thessaloniki and Giuseppe Lembo – COISPA Tecnologia & Ricerca)

This module will demonstrate sustainable and resilient nutritional solutions for highest possible fish performance that would be safe for a sustainable aquaculture. It will cover innovative, species-specific nutritionally adequate, tailor-made, low ecological footprint fish diets and their nutritional impact on farmed fish growth performance, health and quality for a better performing sustainable and organic aquaculture.

In addition, it will be demonstrated how the understanding of the impacts of environmental change and human activity on farmed fish can be greatly enhanced by the use of Internet of Things. Indeed, the knowledge of life traits, such as fish behaviour, condition, physiology and the farming environment will be significantly improved by using electronic sensors, providing industry with information needed to facilitate health/welfare and optimal management practices.

The module builds on the basic knowledge of fish biology, physiology and biochemistry:

- Session I Fish nutrition in aquaculture
- Session II Internet of Things for healthy fish and environment
- Session III Innovative fish feeds for health fish for a healthy human consumption
- Session IV Metabolic traits of free-swimming fish in aquaculture

Learning objectives

At the completion of this module participants will be able to:

1. **Understand** the role of nutritional research in sustainable and organic aquaculture;
2. **Understand** how Internet of Things can contribute to precision livestock farming, by enhancing animal welfare, but also production and environmental sustainability;
3. **Understand** the relationship between innovative fish feeds and nutrition for the production of a healthy fish;
4. **Understand** how the measurements of fish metabolic rates have been proven to be sensitive for monitoring welfare & performance in farmed fish

Module II: Consumer perception and preferences

(Themis Altintzoglou - NOFIMA)

This module will be organized in two parts that are stages in a sequence for developing communication campaigns with the aim of increasing consumer awareness about sustainable aquaculture in Europe.

The **first stage** will focus on how we can extract information from an experiment with consumers in order to identify the consumer perception and preference towards information regarding sustainable aquaculture in Europe. This type of information experiments can be used in various ways and an example of social media communication will be used to exemplify how this can be done in a concrete way.

The **second stage** will focus on how the result from an experiment can be applied in the design and development of guidelines for social media communication campaign about the topic of sustainable aquaculture in Europe. The aim of the campaign guidelines is to increase awareness and the course will show how such a strategy can look as an end point output.

Learning Objectives

At the completion of this module participants will be able to:

1. **Understand** how consumers respond to information about sustainable aquaculture production methods in Europe
2. **Apply** knowledge on consumer reactions to practical guidelines for a marketing communication campaign

Module III: Regulatory framework of aquaculture in the EU, with special focus on organic aquaculture

(Ingrid Kvalvik – NOFIMA & Stefan Holler - Naturland)

It is an EU policy goal to increase aquaculture production, as clearly expressed in the reformed Common Fisheries Policy (CFP) adopted in 2013. Hence, the EU has launched several initiatives to improve the conditions for aquaculture growth in Europe, where regulatory and administrative issues, including area access, for a long time have been considered important reasons for the stagnation in production.

The aim of this thematic session is to contribute with knowledge on some of the challenges that aquaculture producers are facing in Europe related to access to production space. Taking the EU policy on aquaculture, in particular the strategic guidelines for aquaculture development and the Marine Spatial Planning Directive 2014, as a departure, national policies to promote aquaculture will be analysed. The focus will be on initiatives related to marine spatial planning and the promotion of area access.

The session will be organised as a short lecture accompanied with information on where to find relevant publicly available information and an exercise to learn more on the subject related to your own or selected country.

Learning Objectives:

At the completion of this module participants will be able to:

1. **Describe EU policies on aquaculture (regulations, guidelines, and collaborative arrangements)**
2. **Explain** the implementation of EU policies in selected countries on – status, progress and challenges related to access to new production area

Module IV: Recovery / retake and final synthesis

Methodology

In order to ensure the best possible outreach, the **on-line course** sessions will be delivered through the CIHEAM Bari eLearning platform. Through a multiple-instructional setting, the goal is to achieve the **learning objectives** by means of learning technologies that match **individual learning styles** and by the **inclusion of “collaborative” learning** that aims at the development of **just-in-time skills of adult learners**. At the same time, to allow participants maximum flexibility of scheduling, the learning will be conducted in **an asynchronous manner**.

The mean length of time required to each learner is **about 6-8 hours in total**. CIHEAM Bari Model will combine **self-learning** with **assessments**.

The pedagogy - adapted specifically to professionals in **full-time work** - will help train participants through **various experiences**: **absorb**: reading of teaching material (texts and Various media); **do**: execution of all exercises, consultation of recommended and suggested reading and sites (i.e.: *Bibliography, Linkography and Glossary*) and **self-evaluation test**.

Participants’ profile and Targeted audience

The main target groups for the course are innovation brokers, SMEs, and policy makers.

Additional Information

All teaching materials will be delivered in English.

A certificate of completion will be issued by CIHEAM Bari to all participants who complete the course-related assignments and assessments successfully.

Contacts

CIHEAM Bari Online Course References

**Coordinator and Instructional
Designer**

Driouech Nouredin
e-mail: driouech@iamb.it

e-Tutor
Emanuela Montenegro
e-mail: montenegro@iamb.it

Platform Admin
Onofrio Lorusso
e-mail: lorusso@iamb.it

FutureEUAqua Projects involved staff

Massimo Zuccaro, Nouredin Driouech, **CIHEAM Bari-Italy** / Emanuele BUSSACA, **IFOAM EU Organics** and Zsófia Kertész , **CampdenBRI- Hungary**

Module 0: Introductory sessions

Module 1: Elena Mente – University of Thessaloniki, **Greece and** Giuseppe Lembo – COISPA, **Italy**

Module 2: Themis Altintzoglou - **NOFIMA , Norway**

Module 3: Ingrid Kvalvik – **NOFIMA, Norway &** Stefan Holler – **Naturland, Germany**

Module 4: Recovery/Retake and final synthesis