

## *Informative Study Guide*

**2024**

### *Fish feed and seafood quality control*



## 1. Introduction

The Center of Continuing Education and Lifelong Learning (CCELL) of the Agricultural University of Athens (AUA) welcomes you to the educational program entitled "**Fish feed and seafood quality control**" with a total occupational duration of **50 hours**. The program will be conducted in the Laboratory of Applied Hydrobiology of the Department of Animal Science at the Agricultural University of Athens and will be implemented using a **blended** learning approach, **distance learning** (Synchronous Education) through the CCELL /AUA E-class platform and **in-person** (participants' physical presence is required).

Scientific Manager of the program is Ms. [Eleni Miliou](#) Professor of the Department of Animal Science of the Agricultural University of Athens

## 2. Purpose

The current Training Program is implemented within the framework of the action: "**External services implementation**" of the EU-CONEXUS-RESEARCH FOR SOCIETY (EU-CONEXUS-RFS) program of the European Commission (HORIZON 2020), with the main objective of combining access in advanced research infrastructures and processes, training in how to use them, learning new skills and sharing best practices (job shadowing)

## 3. Program Necessity

Chemical composition analysis is an important way to assess the nutritional value of fish. These analyzes are necessary to evaluate the quality, nutritional value, energy content, and safety of fish. They provide information for researchers in the fish feed industry and aquaculture, aiding decision-making and ensuring product quality and safety. They contribute to new product development, labeling, and compliance with food safety regulations. Analyzing the chemical composition of fish feeds determines their nutrient composition to ensure the optimal growth of farmed fish. Existing knowledge can contribute to the production of high-quality aquaculture products through the adoption of sustainable practices, promoting improvements in the production process, and protecting the aquatic environment.

## 4. Learning objectives

Upon completion of this course, participants will have understood the importance of chemical composition for both fish welfare and consumer nutrition and will have been taught the commonly used methods for its analysis. They will be informed about the importance of labeling and ensuring compliance with food safety regulations and consumer information.

### Knowledge:

1. Understanding the importance of chemical composition analysis in assessing the quality of fish and fish feed.
2. Familiarity with the analytical techniques used to determine the chemical composition of fish and fish feed samples.
3. Interpretation of proximate composition analysis results and understanding the implications of different values for moisture, protein, fat, and ash contents
4. Searching, analyzing and synthesizing data
5. Knowledge of production systems in aquaculture
6. Understanding the basic stages of production in aquaculture
7. Capability to address issues in the production process of aquaculture products

## Skills:

1. Promotion of creative and inductive thinking
2. Adaptation to new situations
3. Decision making

## Abilities:

1. Respect for the natural (aquatic) environment
2. Animal (fish) welfare awareness
3. Individual and group work

## 5. Target group

Graduates of Schools of Natural Sciences such as, for example: graduates holding a degree in Marine Science, Oceanography, Animal Sciences, Biosciences, Biotechnology, Biology, Biochemistry, and other Applied Sciences, Veterinary Sciences, high school teachers in Natural Sciences, as well as other individuals interested in the subject.

## 6. Certificates

### Certificate Type:

- Certificate of Education

## 7. Educational program structure

Title of teaching unit	Subsection title	Duration in hours	ECVET/ ECTS
"Fish feed and seafood quality control"	Subsection 1.1: Introduction to Proximate composition analysis for assessing the quality, nutritional value, energy content, product development, and food safety aspects of fish and fish feed	10,0	0,4
	Subsection 1.2: Determination of moisture content (principle, methodology, data analysis)	7,5	0,3
	Subsection 1.3: Determination of ash content (principle, methodology, data analysis)	4,0	0,2
	Subsection 1.4: Determination of protein content (principle, methodology, data analysis)	17,5	0,7
	Subsection 1.5: Determination of fat content (principle, methodology, data analysis)	11,0	0,4

## 8. workshop

Practical training is NOT included

## 9. Scientific team

Scientific Manager of the program is Ms. **Eleni Miliou** Professor, Department of Animal Science, Agricultural University of Athens

[https://zp.aua.gr/faculty/miliou-barsaki\\_eleni/](https://zp.aua.gr/faculty/miliou-barsaki_eleni/)

The training program is delivered by members of the AUA academic staff of the and external collaborators:

**Eleni Miliou**, Professor, Department of Animal Science, Agricultural University of Athens

[https://zp.aua.gr/faculty/miliou-barsaki\\_eleni/](https://zp.aua.gr/faculty/miliou-barsaki_eleni/)

**Emmanouil Malandrakis** Assistant Professor, Department of Animal Production Science, Agricultural University of Athens

**Evanthia Chatzoglou**, Scientific Associate AUA

## 10. Method of implementation

**Mixed, distance learning** (Synchronous Education) through the CCELL /AUA E-class platform and **in-person** (participants' physical presence is required).

## 11. Training techniques - Tools - Equipment

The training techniques in this training program are designed taking into account the specificities and needs of adults. They have been designed and adapted according to the needs and interests of those employed in the fields of Marine Science, Biosciences, Veterinary Sciences, Food Safety, and Education. Training methods will be employed where participants actively engage in experimental procedures, create working groups for activities that promote critical thinking, and expand knowledge in the subject of study. Participants will be trained with the aim of perceiving the direct correlation between learning and practical application in their workplace. Training will be conducted using the scientific equipment of the **Applied Hydrobiology Laboratory of the Agricultural University of Athens, in laboratory rooms of the premises as well as in classrooms of the Department of Animal Science**. Additionally, for remote teaching methods, the capabilities of Microsoft Teams software or **the CCELL /AUA E-class platform** will be utilized.

The current program involves measuring the protein content, total fat, moisture, and ash (solid matter) content of fish and fish feed.

In detail:

- Moisture is measured by the evaporation method as a percentage of the total mass of the sample.
- Ash is measured by the combustion method as a percentage of the total mass of the sample.
- The determination of total protein content is carried out by the Kjeldahl method. This method involves the determination of total nitrogenous compounds and the estimation of the proteins in the sample.
- The determination of total fat content is conducted using the Soxhlet method, which is utilized for the extraction of total fat from the sample through solvent extraction.

### Laboratory equipment:

- Analytical balance accurate to 0.1 mg,
- 60-100°C temperature furnaces
- Muffle furnace with temperature 530°C
- Digestor with scrubber and steam still distillator
- Automatic titrator
- Fat Hydrolysis and extraction devices

## 12. Educational Material - Additional Resources

The educational material of the seminar consists of notes describing the theoretical background of the analyses, their purpose and significance, and their applications in the fields of Marine Sciences, Biosciences, Veterinary Sciences, and Food Safety. Additionally, analysis protocols with instructions for equipment use are provided. Supplementary sources of information such as literature, websites, and video presentations are also offered, aiming to expand knowledge on the subject, explore the possibilities of applying the provided knowledge and enhance relevant skills.

## 13. Evaluation Methodology

### 13.1 Evaluation of trainees

1. **Solving exercises during the seminar**
2. Final exam with **Multiple Choice Test** (minimum passing level: 50% correct answers)

### 13.2 Evaluation of the training program (trainers, trainees, CCELL)

The evaluation of the training program will be done through a **questionnaire** completed by trainees. The findings will be used to continue and/or improve the training program.

## 14. Obligations of trainees/Certificate of Education

To successfully complete the program, participants must:

- have attended all the teaching modules. Absences cannot exceed 10% of the scheduled training hours.
- to have successfully completed the training program examination, the trainees must answer correctly at least 50% of the questions of the final examination, i.e. achieve a grade of at least 50, with an excellent score of 100. In this case, the trainees receive a Certificate of Education, which is published by the Center for Education and Lifelong Learning of the Agricultural University of Athens. The examination will take place through the **electronic CCELL/AUA E-class platform**.
- to have paid all the tuition fees by the start of the Program.
- to have submitted the completed evaluation questionnaire of the Educational Program.

After the successful completion of the program, the participants are awarded a Certificate of Education, which is issued by the Center of Continuing Education and Lifelong Learning (CCELL) of AUA.

Participants who attended but did not complete the entire program may be provided with a **Certificate of Attendance**.

## 15. Participation cost/Discount policy

The cost of participating in the program is **150 euros** and must be paid before the start of the program in order to secure participation in the program.

Discount Policy:

- to AUA graduates: 15%,
- for those who attended, or have simultaneously enrolled in one of the following Training programs 10% and for those who have enrolled or are currently attending both of the following Training programs 15%
  - " Application of gas chromatography for the determination of fatty acids in fish and fish feed "
  - "Applications of Molecular Biology in Fisheries and Aquaculture"

Interested parties **deposit the above amount into the following account**, in which the beneficiary is the AUA **Special Research Funds Account (E.L.K.E.)**, necessarily stating their name and the **ELKE code** of the project: **(Code 80213)**

**National Bank in the account with IBAN GR 280110040000004001883448**

**The proof of deposit is attached to the submitted application electronically on the website of the Center of Continuing Education and Lifelong Learning (CCELL) of the Agricultural University of Athens (AUA)**

## **16. Applications**

Those interested submit an application online until **26/3/2024** [on the website of the Center of Continuing Education and Lifelong Learning \(CCELL/K.E.DI.VI.M.\) of the AUA](#) and fill in or attach all the prerequisites.

In the event that the minimum required number of trainees is not gathered, CCELL reserves the right to change the start date of the program or to cancel it.

## **17. Contact**

For more information, interested parties can contact

- with the Secretarial Support of the e-mail program: [echatzoglou@aua.gr](mailto:echatzoglou@aua.gr) Telephone number: 210 5294401 (10.00-15.30)
- with the Secretariat of the Education & Lifelong Learning Center (K.E.DI.VI.M.) of the Agricultural University of Athens: email: [kedivim@aua.gr](mailto:kedivim@aua.gr) Telephone number: 210 5294400 (10.00-15.30)



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