

# Postgraduate Diploma Aquaculture Nutrition





## Postgraduate Diploma Aquaculture Nutrition

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Global University
- » Credits: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/veterinary-medicine/postgraduate-diploma/postgraduate-diploma-aquaculture-nutrition](http://www.techtute.com/us/veterinary-medicine/postgraduate-diploma/postgraduate-diploma-aquaculture-nutrition)

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# 01

# Introduction

In order to achieve a correct running of aquaculture production, it is necessary to adequately control the nutrition of the species, since this can lead to an increase or decrease in culture yields. Increase your knowledge in this field with the study of this complete Postgraduate Diploma and give a boost to your professional career.

*Proper nutrition is essential to increase fish yields in aquaculture.*





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*Global population growth requires new advances in breeding and farming systems to ensure an adequate food supply.”*

Aquaculture is an activity of great relevance, since it has become one of the most economically important activities in the field of food production and for the breeding of live organisms for repopulation and for the cultivation of species for ornamental use, among others.

The management and knowledge of nutrition in different aquatic species can be one of the fundamental factors that determine the good yield of a culture, while a poor management of this aspect can be reflected in low aquaculture production.

In the current circumstances, where the use of chemicals and antibiotics is increasingly limited, it is necessary to master the role of nutrients and additives in the manufacture of feed used in the aquaculture industry.

The study of the intestinal microbiota of fish, for example, is also an important development in aquaculture nutrition. There is currently a lot of information about their composition, abundance, diversity, activity and how to make use of this knowledge to improve crop yields, since these microbes have important implications on host health, development, well-being and, above all, nutrition.

In addition, it must be taken into account that each type of culture has different characteristics, and therefore each species has a specific set of requirements in terms of nutrition.

This Postgraduate Diploma provides students with specialized tools and skills to successfully develop their professional activity in the wide aquaculture environment, works on key competencies such as knowledge of the reality and daily practice of the professional, and it further promotes responsibility in the monitoring and supervision of their work, as well as communication skills through essential teamwork. In addition, as it is an online Postgraduate Diploma, the student is not constrained by fixed timetables or the need to move to another physical location, but can access the contents at any time of the day, balancing his or her work or personal life with their academic life.

This **Postgraduate Diploma in Aquaculture Nutrition** contains the most complete and up-to-date educational program on the market. The most important features of the program include:

- ◆ The development of case studies presented by experts in Aquaculture Nutrition
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ◆ New developments in Aquaculture Nutrition
- ◆ Practical exercises where self-assessment can be used to improve learning.
- ◆ Special emphasis is placed on innovative methodologies in Aquaculture Nutrition
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Immerse yourself in this high-quality educational training-program, which will allow you to face the future challenges in Aquaculture Nutrition"*

“

*This Postgraduate Diploma is the best investment you can make in selecting a refresher program to bring your knowledge of Aquaculture Nutrition up to date."*

Its teaching staff includes professionals belonging to the veterinary field, who contribute their expertise to this training, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive training programmed to train in real situations.

The design of this program is based on Problem-Based Learning, by means of which the specialist must try to solve the different professional practice situations that arise during the academic course. For this purpose, the professional will be assisted by an innovative interactive video system, developed by well-known experts in Aquaculture Nutrition

*This training comes with the best didactic material, providing you with a contextual approach that will facilitate your learning.*

*This 100% online Postgraduate Diploma will allow you to combine your studies with your professional work while increasing your knowledge in this field.*



# 02 Objectives

The Postgraduate Diploma in Aquaculture Nutrition is designed to facilitate the performance of the veterinary professional with the latest advances and most innovative procedures in the sector.







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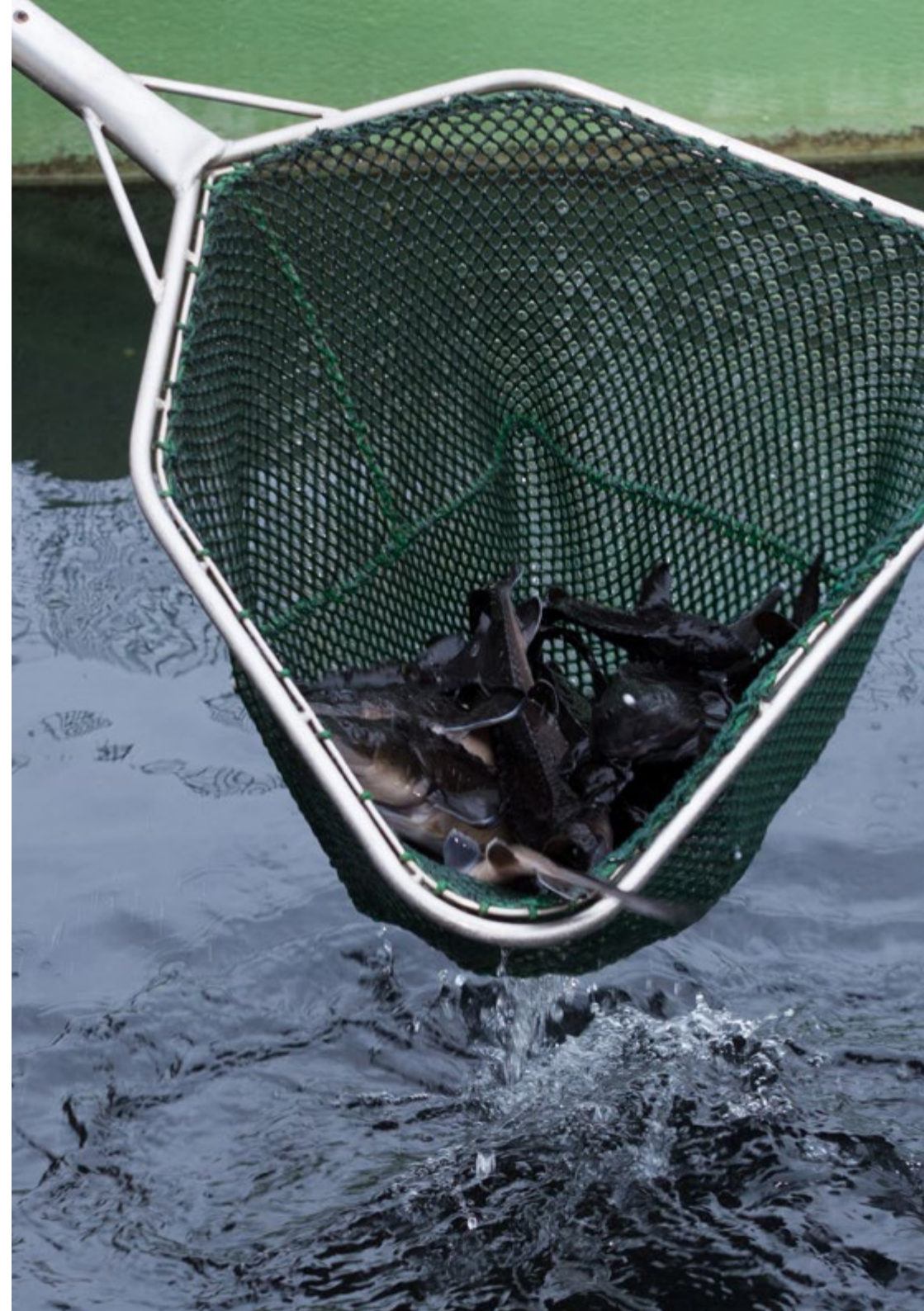
*Our goal is to achieve academic excellence and to help you achieve professional success as well.”*



## General Objectives

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- ♦ Examine the different types of aquaculture
- ♦ Generate specialized knowledge on the criteria and parameters that determine a quality environment in which to implement an Aquaculture culture
- ♦ Specify what measures are necessary to keep crops secure
- ♦ Build specialized knowledge on the fundamentals of genetic improvement in aquaculture.
- ♦ Examine the nutritional requirements of aquatic crops
- ♦ Master the formulation techniques of different types of feed for aquaculture cultures
- ♦ Generate specialized, quality food knowledge to select the most appropriate raw materials
- ♦ Analyze the intestinal microbiota of aquatic species to obtain better culture yields
- ♦ Analyze the details of the different Aquaculture crops
- ♦ Analyze the differences that can be observed between the various types of aquaculture cultures
- ♦ Examine the different systems used within the existing variety of Aquaculture cultures
- ♦ Determine the different standards to be followed in the different products obtained within the wide practice of aquaculture





## Specific Objectives

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### Module 1 Aquaculture Production

- ♦ Analyze the history and evolution of aquaculture production for a better understanding of its current situation
- ♦ Examine the different criteria that determine water quality in aquaculture
- ♦ Determine the parameters that determine water quality in aquaculture
- ♦ Analyze the different types of cultures that exist and the most frequent production systems for them
- ♦ Examine the different biosecurity measures existing within the different types of cultures
- ♦ Generate specialized knowledge on the different genetic resources that can be used to achieve culture improvement
- ♦ Establish the processes of handling and waste management in aquaculture
- ♦ Develop expertise in ways to control, manage and minimize the pollution produced by this activity



*Join one of the largest online universities in the world"*

### Module 2 Nutrition in Aquaculture Farms

- ♦ Determine the nutritional requirements of fish, crustaceans and mollusks
- ♦ Manage practical feed formulation for different life stages, such as larval, fattening, and reproductive stages
- ♦ Analyze the digestibility of key food components
- ♦ Establish the relevant aspects of the different forms of presentation of feed for Aquaculture cultures
- ♦ Generate specialized knowledge on the supply of minerals, vitamins and other additives
- ♦ Analyze the advantages and possible disadvantages derived from the use and misuse of probiotics
- ♦ Examine live feed cultures and their use in Aquaculture

### Module 3 Aquaculture Culture Models

- ♦ Examine the Production Systems used in Inland Aquaculture
- ♦ Analyze culture patterns of different inland species
- ♦ Determine the production systems used in Marine Aquaculture
- ♦ Analyze the culture patterns of different marine species
- ♦ Examine the production systems used in Ornamental Aquaculture
- ♦ Analyze culture patterns of different ornamental species
- ♦ Determine the details and differences between different fish species in order to take them into account in their culture methods
- ♦ Develop the most relevant aspects of other types of Aquaculture models, such as live feed culture

03

# Course Management

The program's teaching staff includes leading experts in Aquaculture who contribute their vast work experience to this training program. They are world-renowned professionals from different countries with proven theoretical and practical professional experience.





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*We have the best Teaching Team in the field of Aquaculture, with years of experience and who are determined to transmit all their knowledge about this Sector”*

## Management



### Mr. Gracia Rodríguez, José Joaquín

- Degree in Veterinary Medicine from the University of Murcia.
- Diploma in Aquaculture Specialization. Polytechnic University of Valencia
- Advanced Ichthyopathology course
- International Congress on sustainable Aquaculture
- Certificate in Pedagogical Aptitude University of Extremadura
- Attendance at the AVEPA Continuing Education conference
- Teacher in Higher Vocational Training Degrees in the sanitary branch
- Training in biosecurity and pathology in the ornamental Aquaculture sector
- Speaker at national congresses and courses on ornamental Aquaculture
- Training courses for livestock farmers on safety and regulations in the transport of animals
- Food handler courses for companies and individuals
- Consultant in Ichthyopathology for several companies in the Aquaculture sector
- Technical Director in the ornamental Aquaculture industry
- Coordination of projects in maintenance of wild species and water quality
- Projects in natural parks for the control of allochthonous ichthyofauna
- Projects for the recovery of native crayfish
- Carrying out wildlife species censuses
- Coordination of livestock sanitation campaigns in Castilla-La Mancha
- Veterinarian in a breeding and genetic improvement company in the rabbit breeding sector



### **Ms. Herrero Iglesias, Alicia Cristina**

- Degree in Veterinary Medicine from the University of Extremadura.
- Master's Degree in Secondary Education, International University of La Rioja
- Course "Animal Welfare in Livestock Production" organized by the Official College of Veterinarians of Madrid, in collaboration with the Faculty of Veterinary Medicine UCM and the Ministry of Environment and Land Management of the Community of Madrid
- Occupational Trainer, given by the INESEM Postgraduate Training Center.
- Course "Trainer of Trainers", Antonio de Nebrija University
- Teacher in the Degree in Veterinary Medicine, Alfonso X el Sabio University (Madrid)
- Since February 2012 she has been Teaching "Ethnology and Veterinary Business Management" and "Animal Production"
- From the academic year 2016-2017 to the present, teaching Hematological Analysis Techniques and Immunological Diagnostic Techniques for the 2nd year of the Formative Cycle of Higher Degree of Clinical and Biomedical Laboratory in Opesa (Madrid)
- Secondary School Teacher Cristóbal Colón School (Talavera de la Reina) Academic Year 18/19
- Veterinary trainer in the Alonso Herrero APPCC Company for the training of food handlers
- Teacher of the course of Veterinary Technical Assistant, in Grupo INN, giving classes during the course 18/19 (Talavera de la Reina)
- Her professional career began with field work in the field of large animal production
- After working in animal health and sanitary inspection, she began to focus on the field of teaching
- At present, she combines her teaching work at the University with higher technical classes and field activities within the veterinary field
- During her professional career, she has taken a large number of continuing education and specialization courses
- Stays at the Minimal Invasive Surgery Center Jesús Usón (JUMISC) in Cáceres.
- She was also a student intern at the Department of Medicine of the Faculty of Veterinary Medicine at the UEX

04

# Structure and Content

The structure of the contents has been designed by the best professionals in the Aquaculture Nutrition sector, with an extensive experience and recognized prestige in the profession, backed by the volume of cases reviewed, studied and diagnosed, and with a wide mastery of new technologies applied to veterinary medicine.







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*TECH has the most complete and up-to-date scientific program on the market. We strive for excellence and for you to achieve it too.”*

## Module 1 Aquaculture Production

- 1.1. Aquaculture
  - 1.1.1. History
  - 1.1.2. Types of Aquaculture according to the Organism to be Cultured
  - 1.1.3. Types of Aquaculture according to Location
  - 1.1.4. Aquaculture in Micro-Reservoirs
  - 1.1.5. Recirculation Systems in Aquaculture
- 1.2. Water Quality
  - 1.2.1. Water in Aquaculture
  - 1.2.2. Physical Properties of Water
  - 1.2.3. Water Quality Criteria
  - 1.2.4. Measurements
- 1.3. Water Quality Parameters in Aquaculture Cultures
  - 1.3.1. Physical Parameters
  - 1.3.2. Chemical Parameters
  - 1.3.3. Biological Parameters
- 1.4. Types of Aquaculture
  - 1.4.1. Fish Farming
  - 1.4.2. Bivalve Mollusk Culture
  - 1.4.3. Crustacean Culture
- 1.5. Live Food Culture
  - 1.5.1. Importance of Live Food
  - 1.5.2. Use of Microalgae as Live Feed
  - 1.5.3. Rotifers as Live Food
  - 1.5.4. Artemia as Live Food
  - 1.5.5. Other Organisms used as Live Food





- 1.6. Aquaponics.
  - 1.6.1. Introduction
  - 1.6.2. Aquaponic Recirculation Systems
  - 1.6.3. Design of Aquaponic Recirculating Aquaponics System
  - 1.6.4. Species used in this Type of System
- 1.7. Biosecurity in Aquaculture Farms
  - 1.7.1. Biosecurity
  - 1.7.2. Measures to Reduce the Risk of Pathogen Incursion
  - 1.7.3. Measures to Reduce the Risk of Pathogen Spread
- 1.8. Prophylaxis and Vaccination in Aquaculture
  - 1.8.1. Immunology
  - 1.8.2. Vaccination as a Preventive Measure
  - 1.8.3. Types of Vaccines and Means of Administration in Aquaculture
- 1.9. Handling and Waste Management in Aquaculture
  - 1.9.1. Waste Management
  - 1.9.2. Waste Characteristics
  - 1.9.3. Waste Storage
- 1.10. Aquaculture as a Source of Pollution and its Prevention
  - 1.10.1. Inland Aquaculture as a Source of Pollution
  - 1.10.2. Marine Aquaculture as a Source of Pollution
  - 1.10.3. Other types of Aquaculture as a Source of Pollution
  - 1.10.4. Prevention of Water Pollution in Inland Aquaculture Activity
  - 1.10.5. Prevention of Water Pollution in Marine Aquaculture Activity
  - 1.10.6. Prevention of Water Pollution in Other Aquaculture Activities

## Module 2 Nutrition in Aquaculture Farms

- 2.1. Nutritional Requirements of Aquatic Organisms
  - 2.1.1. Nutritional Requirements of Fish
  - 2.1.2. Nutritional Requirements of Crustaceans
  - 2.1.3. Nutritional Requirements of Molluscs
- 2.2. Practical Feed Formulation
  - 2.2.1. Larval Feed Formulation
  - 2.2.2. Feed Formulation for Fattening
  - 2.2.3. Feed Formulation for Reproductive Stage
- 2.3. Feed Quality and Raw Material Selection
  - 2.3.1. Proteins
  - 2.3.2. Amino Acids
  - 2.3.3. Carbohydrates
  - 2.3.4. Lipids
- 2.4. Digestibility of Food Components
  - 2.4.1. Protein
  - 2.4.2. Amino Acids
  - 2.4.3. Carbohydrates
  - 2.4.4. Lipids
- 2.5. Forms of Presentation of Feed for Aquaculture Cultures
  - 2.5.1. Floating Feeds
  - 2.5.2. Pelletized
  - 2.5.3. Expanded
  - 2.5.4. Extruded
- 2.6. Supply of Minerals, Vitamins and Other Additives
  - 2.6.1. Minerals
  - 2.6.2. Vitamins
  - 2.6.3. Other Additives
- 2.7. Intestinal Microbiota
  - 2.7.1. The Importance of Microbiota
  - 2.7.2. Microbiota Composition
  - 2.7.3. Factors influencing the Composition of the Microbiota
- 2.8. Use of Probiotics in Aquaculture
  - 2.8.1. Probiotics
  - 2.8.2. Beneficial Effects of Probiotics
  - 2.8.3. Immune Response to the Intestinal Microbiota
  - 2.8.4. Organisms Considered as Probiotics
  - 2.8.5. Some Problems Associated with the Misuse of Probiotics
- 2.9. Live Feeding: Probiotics and Prebiotics
  - 2.9.1. Bacterial Aspects of Live Feeding
  - 2.9.2. Bacterial Control in Live Feed Cultures
  - 2.9.3. Live Feed Enrichment and Microbial Implications
  - 2.9.4. Probiotics in Live Feed Production
  - 2.9.5. Prebiotics and Synbiotics in Live Feeds
- 2.10. Antinutritional Factors and Toxins in Feeds
  - 2.10.1. Thiaminase
  - 2.10.2. Avidin
  - 2.10.3. Protease Inhibitors
  - 2.10.4. Lectins
  - 2.10.5. Phytoestrogens and Phytosterols
  - 2.10.6. Phytic Acid
  - 2.10.7. Glucosinolates
  - 2.10.8. Saponins
  - 2.10.9. Alkaloids
  - 2.10.10. Mycotoxins

### Module 3 Aquaculture Farming Models

- 3.1. Inland Models I
  - 3.1.1. Cyprinid Farming
  - 3.1.2. Tilapia Farming
- 3.2. Inland Models II
  - 3.2.1. Trout Farming
  - 3.2.2. Salmon Farming
- 3.3. Marine Aquaculture Models I
  - 3.3.1. Sea Bream Farming
  - 3.3.2. Sea Bass Farming
- 3.4. Marine Aquaculture Models II
  - 3.4.1. Turbot Farming
  - 3.4.2. Tuna Farming
- 3.5. Mollusc Culture Models
  - 3.5.1. Clam Farming
  - 3.5.2. Mussel Farming
- 3.6. Crustacean Aquaculture Model
  - 3.6.1. Shrimp Farming
  - 3.6.2. Shrimp Farming
- 3.7. Ornamental Aquaculture Farming Models. Freshwater Species I
  - 3.7.1. Viviparous Farming
  - 3.7.2. South American Cichlids Farming
  - 3.7.3. African Cichlids Farming
- 3.8. Ornamental Aquaculture Farming Models. Freshwater Species II
  - 3.8.1. African Cichlids Farming
  - 3.8.2. Discus Fish Farming
  - 3.8.3. Koi Farming
  - 3.8.4. Farming of Other Freshwater Species

- 3.9. Models of Ornamental Aquaculture. Saltwater Species
  - 3.9.1. Clownfish Farming
  - 3.9.2. Paracanthurus Hepatus Farming
  - 3.9.3. Pterapogon Kauderni Farming
  - 3.9.4. Macro and Microalgae Cultivation
- 3.10. Other Aquaculture Farming Models
  - 3.10.1. Microalgae Cultivation
  - 3.10.2. Macroalgae Cultivation
  - 3.10.3. Live Food Farming



*Achieve professional success with this high-level training provided by prestigious professionals with extensive experience in the sector"*

# 05 Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.





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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you can experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, in an attempt to recreate the actual conditions in a veterinarian's professional practice.



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*Did you know that this method was developed in 1912 for Harvard law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method.*

**The effectiveness of the method is justified by four fundamental achievements:**

1. Veterinarians who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity through exercises to evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. The feeling that the effort invested is effective becomes a very important motivation for veterinarians, which translates into a greater interest in learning and an increase in the time dedicated to working on the course.



## Relearning Methodology

At TECH we enhance the Harvard case method with the best 100% online teaching methodology available: Relearning.

This University is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the simple study and analysis of cases.

*Veterinarians will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 65,000 Veterinarians have been trained with unprecedented success, in all clinical specialties regardless of the surgical load. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

*Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high-quality pieces in each and every one of the materials that are made available to the student.



### Latest Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current and procedures of veterinary techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.



### Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

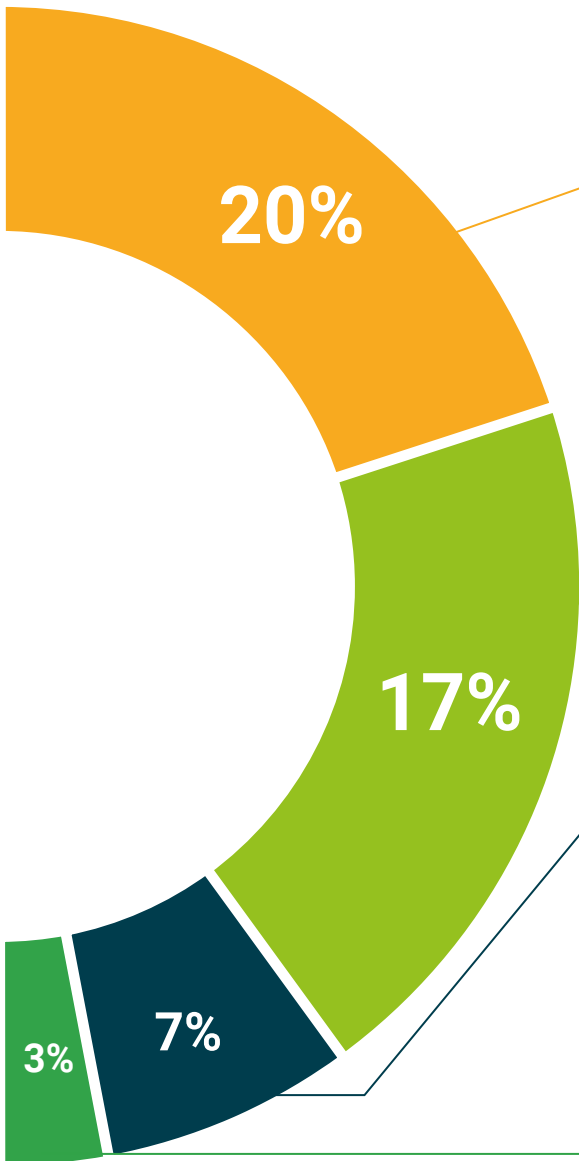
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



#### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



#### Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.



# 06 Certificate

The Postgraduate Diploma in Aquaculture Nutrition guarantees students, in addition to the most rigorous and up to date education, access to a Postgraduate Diploma issued by TECH Global University.



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*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork”*

This program will allow you to obtain your **Postgraduate Diploma in Aquaculture Nutrition** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Diploma in Aquaculture Nutrition**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.



future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation **tech** global university

knowledge present quality

online training **Postgraduate Diploma  
Aquaculture Nutrition**

development language

virtual classroom

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