

# Postgraduate Certificate

## Microbial Foodborne Diseases





## Postgraduate Certificate Microbial Foodborne Diseases

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Accreditation: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/nutrition/postgraduate-certificate/microbial-foodborne-diseases](http://www.techtute.com/us/nutrition/postgraduate-certificate/microbial-foodborne-diseases)

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# 01

# Introduction

Incorrect treatment of food and the lack of hygienic conditions during handling trigger serious diseases caused by microbes that develop as a result of these two factors. For this reason, it is essential to have professionals specialized in the aspects that increase the biological risk factors, since their knowledge allows the development of safety plans and strategies so that the process that the products must follow is of high quality. With this in mind, TECH developed an academic program that will provide its participants with a complete curriculum on the concepts that encompass this field of study and that will be conducted 100% online, which will allow students to have greater control over their time.





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*This Postgraduate Certificate will allow you to contribute to the construction of plans for the prevention and control of Foodborne Microbial Diseases”*

Food microbiology deals with the study of microorganisms that cause health problems to the body, so its field of study continues to be of great relevance to ensure the protection of public welfare. In addition, since these diseases are caused by the consumption of food in poor condition or with an incorrect handling process, the implementation of alternatives based on the knowledge offered by research in this area should be carried out by specialists.

With the above in mind, this Postgraduate Certificate program is focused on students not only to gain profound knowledge related to the specificity of this field, but also to increase their professional skills, which will strengthen their strategic vision. In this way, students will acquire a complete perspective of the current demands and challenges of this sector.

In addition, the study plan offers a wide range of knowledge related to Foodborne Microbial Diseases, including the main techniques used in microbiology, sterilization and asepsis, the different culture media and the preparation of samples for microscopic observation. The microbial alterations that occur in food, the factors that influence the alteration of microorganisms and the methods of preservation and control will also be analyzed.

All of this is based on the innovative Relearning methodology, which allows this program to be taught 100% online, a benefit that will allow students to study from anywhere, have greater time flexibility and have access to multimedia resources 24 hours a day. In addition, they will enhance their skills and strengthen their problem-solving skills, since they will analyze practical cases that will place them in the simulation of a real environment.

This **Postgraduate Certificate in Foodborne Microbial Diseases** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Foodborne Microbial Diseases
- ◆ The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable for professional practice
- ◆ Practical exercises where self-assessment can be used to improve learning.
- ◆ Its special emphasis on innovative methodologies
- ◆ 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



*If you want to stand out in your professional field, TECH will provide you with the best knowledge to be the best"*

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*Do you want to grow your career?  
This is the best opportunity to  
achieve it and become an expert  
in Foodborne Diseases”*

The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, 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 education programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

*From the comfort of your home and  
with the technological device of your  
choice, you will be able to expand your  
knowledge about Foodborne Diseases.*

*Salmonella is a disease that  
seriously affects elderly patients and  
with this program, you will be able to  
create strategies to help avoid this  
bacterium during food handling.*



# 02

# Objectives

The main objective of this Postgraduate Certificate is to provide students with the necessary tools to obtain specialized knowledge about the spread of Microbial Diseases that are transmitted by Food. In this way, students will be able to update their knowledge in this field and improve their skills to deal with microorganisms, using multimedia materials designed by excellent professionals in this area.







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*Get specialized knowledge about the microorganisms that develop in food and learn to differentiate which ones are harmful or beneficial to the human body"*



## General Objectives

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- ◆ Identify and understand Biology as an experimental science through the application of the scientific method
- ◆ Explain key principles and how to apply them to population growth and the sustainable exploitation of natural resources
- ◆ Know and apply the procedures for toxicity assessment
- ◆ Contribute to consumer protection within the framework of food safety

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*A Postgraduate Certificate program for professionals who want to enhance their professional profile and achieve excellence”*





## Specific Objectives

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- ◆ Know the main transformative, pathogenic and beneficial microorganisms in food
- ◆ Identify the most important elements of a microbiology laboratory
- ◆ Distinguish the physicochemical parameters that affect microbial growth in foods
- ◆ Evaluate the beneficial effects of microorganisms in foods
- ◆ Apply techniques for the detection of microorganisms in food

# 03

## Structure and Content

The best experts in Nutrition have structured the contents of the syllabus of this Postgraduate Certificate program. Therefore, students will be able to acquire specialized and updated knowledge on how Microbial Diseases that can be transmitted by Food, in addition to knowing the factors that increase this situation and the proper way to avoid it. This, through the study of multimedia resources and the analysis of practical cases, will allow students to improve their professional skills.





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*Gain a deeper understanding of the most commonly used techniques to mitigate the risk of food contamination with this incredible study plan”*

## Module 1. Microbiology and Food Hygiene

- 1.1. Introduction to Food Microbiology
  - 1.1.1. History of Food Microbiology
  - 1.1.2. Microbial Diversity: Archaea and Bacteria
  - 1.1.3. Phylogenetic Relationships Among Living Organisms
  - 1.1.4. Microbial Classification and Nomenclature
  - 1.1.5. Eukaryotic Microorganisms: Algae, Fungi and Protozoa
  - 1.1.6. Virus
- 1.2. Introduction to Food Microbiology
  - 1.2.1. Sterilization and Asepsis Methods
  - 1.2.2. Culture Mediums: Liquid and Solid, Synthetic or Defined, Complex, Differential and Selective
  - 1.2.3. Isolation of Pure Cultures
  - 1.2.4. Microbial Growth in Discontinuous and Continuous Cultures
  - 1.2.5. Influence of Environmental Factors on Growth
  - 1.2.6. Optical Microscopy
  - 1.2.7. Sample Preparation and Staining
  - 1.2.8. Fluorescence Microscope
  - 1.2.9. Transmission and Scanning Electron Microscopy
- 1.3. Microbial Metabolism
  - 1.3.1. Ways of Obtaining Energy
  - 1.3.2. Phototrophic, Chemolithotrophic and Chemorganotrophic microorganisms.
  - 1.3.3. Carbohydrate Catabolism
  - 1.3.4. Degradation of Glucose to Pyruvate (Glycolysis, Pentose Phosphate Pathway and Entner-Doudoroff Pathway)
  - 1.3.5. Lipid and Protein Catabolism
  - 1.3.6. Fermentation
  - 1.3.7. Types of Fermentation
  - 1.3.8. Respiratory Metabolism: Aerobic Respiration and Anaerobic Respiration



- 1.4. Microbial Food Alterations
  - 1.4.1. Microbial Ecology of Foods
  - 1.4.2. Sources of Contamination of Vegetable Foods
  - 1.4.3. Fecal Contamination and Cross Contamination
  - 1.4.4. Factors Influencing Microbial Alteration
  - 1.4.5. Microbial Metabolism in Food
  - 1.4.6. Alteration Control and Preservation Methods
- 1.5. Foodborne Diseases of Microbial Origin
  - 1.5.1. Foodborne Infections: Transmission and Epidemiology
  - 1.5.2. Salmonellosis
  - 1.5.3. Typhoid and Paratyphoid Fever
  - 1.5.4. Campylobacter Enteritis
  - 1.5.5. Bacillary Dysentery
  - 1.5.6. Diarrhea Caused by Virulent E. Coli Strains
  - 1.5.7. Yersiniosis
  - 1.5.8. Vibrio Infections
- 1.6. Diseases Caused by Foodborne Protozoa and Helminths
  - 1.6.1. General Characteristics of Protozoa
  - 1.6.2. Amoebic Dysentery
  - 1.6.3. Giardiasis
  - 1.6.4. Toxoplasmosis
  - 1.6.5. Cryptosporidiosis
  - 1.6.6. Microsporidiosis
  - 1.6.7. Food-borne Helminths: Flatworms and Roundworms
- 1.7. Viruses, Prions and Other Foodborne Biohazards
  - 1.7.1. General Properties of Viruses
  - 1.7.2. Composition and Structure of the Virion: Capsid and Nucleic Acid
  - 1.7.3. Virus Growth and Cultivation
  - 1.7.4. Virus Life Cycle ( Lytic Cycle): Phases of Adsorption, Penetration, Gene Expression and Replication, and Release
  - 1.7.5. Alternatives to the Lytic Cycle: Lysogeny in Bacteriophages, Latent Infections, Persistent Infections and Tumor Transformation in Animal Viruses
  - 1.7.6. Viroids, Virusoids and Prions
  - 1.7.7. Incidence of Foodborne Viruses
  - 1.7.8. Characteristics of Foodborne Viruses
  - 1.7.9. Hepatitis A
  - 1.7.10. Rotavirus
  - 1.7.11. Scombroid Poisoning
- 1.8. Microbiological Analysis of Food
  - 1.8.1. Sampling and Sampling Techniques
  - 1.8.2. Reference Values
  - 1.8.3. Indicator Microorganisms
  - 1.8.4. Microbiological Counts
  - 1.8.5. Determination of Pathogenic Microorganisms
  - 1.8.6. Rapid Detection Techniques in Food Microbiology
  - 1.8.7. Molecular Techniques: Conventional PCR and Real-Time PCR
  - 1.8.8. Immunological Techniques
- 1.9. Beneficial Microorganisms in Food
  - 1.9.1. Food Fermentation: The Role of Microorganisms in the Production of Foodstuffs
  - 1.9.2. Microorganisms as Food Supplements
  - 1.9.3. Natural Preservatives
  - 1.9.4. Biological Systems of Food Conservation
  - 1.9.5. Probiotic Bacteria
- 1.10. Microbial Cell biological
  - 1.10.1. General Characteristics of Eukaryotic and Prokaryotic Cells
  - 1.10.2. The Prokaryotic Cell: Components Outside the Cell Wall: Glycocalyx and S-layer, Cell Wall, Plasma Membrane
  - 1.10.3. Flagella, Bacterial Mobility and Taxia
  - 1.10.4. Other Surface Structures, Fimbriae and Pilli

04

# Study Methodology

TECH is the world's first university to combine the case study methodology with Relearning, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.





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*TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”*

## The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

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*At TECH you will NOT have live classes  
(which you might not be able to attend)”*



### The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

“*TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want*”

## Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



## Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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



## A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



*The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”*

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

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess 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. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

## The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the quality of teaching, quality of materials, course structure and objectives is excellent. Not surprisingly, the institution became the best rated university by its students on the Trustpilot review platform, obtaining a 4.9 out of 5.

*Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.*

*You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.*



As such, the best educational materials, thoroughly prepared, will be available in this program:



### 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. This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



### Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



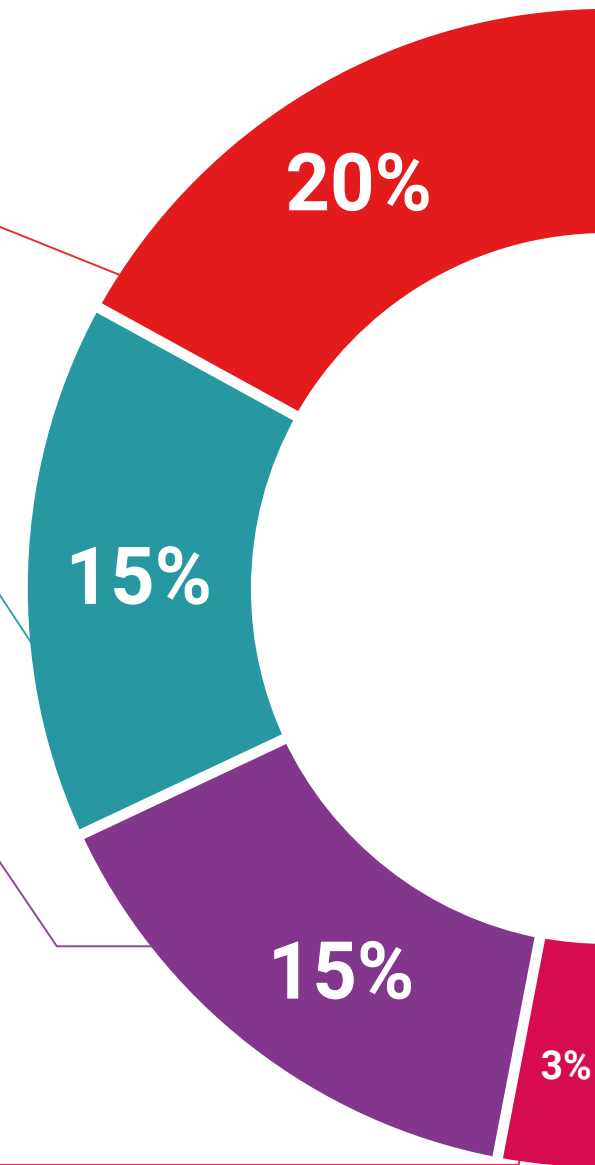
### Interactive Summaries

We present 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".

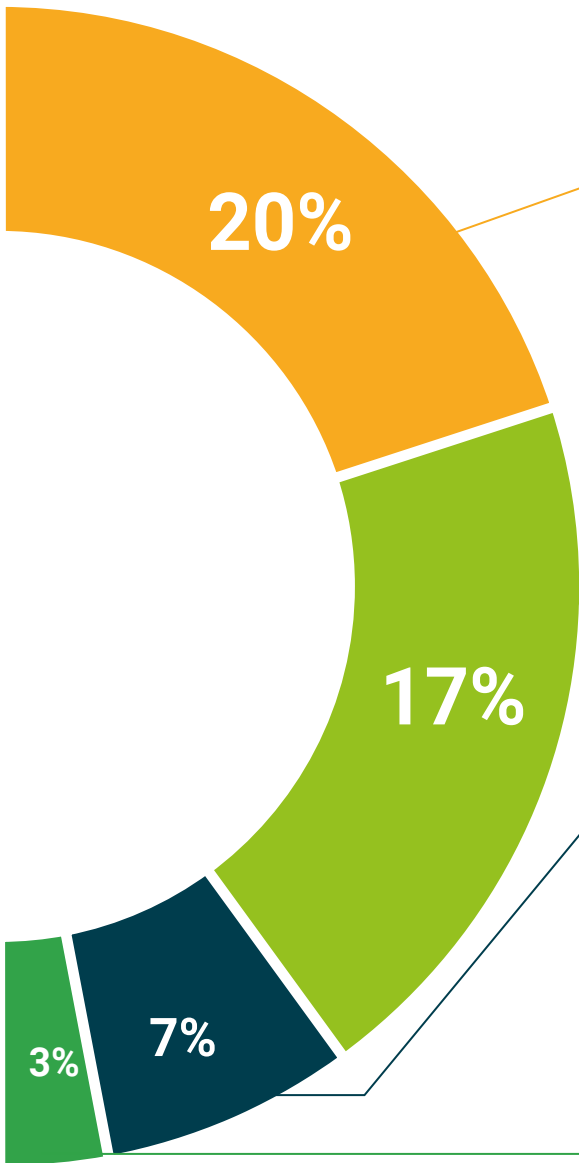


### Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.







**Case Studies**

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



**Testing & Retesting**

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



**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 for 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.



05

# Certificate

The Postgraduate Certificate in Microbial Foodborne Diseases guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate 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 private qualification will allow you to obtain a **Postgraduate Certificate in Foodborne Microbial Diseases** 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** private qualification 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 Certificate in Foodborne Microbial Diseases**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**





## Postgraduate Certificate Microbial Foodborne Diseases

- » Modality: online
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