

27134 - Food Biotechnology

Syllabus Information

Academic year: 2024/25

Subject: 27134 - Food Biotechnology

Faculty / School: 100 - Facultad de Ciencias

Degree: 446 - Degree in Biotechnology

ECTS: 6.0

Year: 4

Semester: Second semester

Subject type: Optional

Module:

1. General information

The food sector is of great economic importance and is a field in which biotechnology has always played an important role. The objective of this subject is that students learn about the applications of Biotechnology in the food sector and related industries. To this end, after studying basic aspects of food and its processing, it focuses on those topics of greatest interest for a future graduate in Biotechnology: current and future role of microorganisms and enzymes in food manufacturing and advances in obtaining genetically modified foods with properties of interest. Practical activities aim to bring the student closer to the industrial reality.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of the United Nations (UN) Agenda (<https://www.un.org/sustainabledevelopment/es/>), specifically, the learning activities planned in this subject will contribute to the achievement of Goals 2, 3, 5, 9 and 12

2. Learning results

Upon completion of the subject, the student will be able to:

- 1- Describe the applications and the current state of Biotechnology in the food field and be able to evaluate the advantages and limitations of new products obtained by biotechnological methods.
- 2- Identify the parameters that define food quality and the role of the different spoilage agents present in food.
- 3-Know the fundamentals of microbial and enzymatic control in food and industrial facilities.
- 4- Know the characteristics of the raw materials and the basics of the most important fermented food manufacturing processes.
- 5- Describe the role of enzymes in food and the most important enzymatic transformations in the food industry.
- 6- Be able to properly choose a starter culture or enzyme for the production of a feed.
- 7- Deduce breeding targets for microbial strains and enzymes of interest in the food industry.
- 8- Analyse the characteristics of the most important genetically modified foods, and explain the most relevant scientific advances in this field
- 9- Be able to consult the relevant sources of information in the field of Food Biotechnology, interpret the information and contextualize it.

3. Syllabus

Block I. Introduction: the food industry, food quality parameters and control of microbial and enzymatic activity

Block II. Fermentations in the food industry: starter cultures (types, applications, advances and legal aspects).

Lactic and alcoholic fermentation: applications and advances. Other foods obtained by fermentation.

Block III. Enzymes of interest: use of enzymes in food processing and biotechnological modification of enzymes of food interest.

Block IV. Genetically modified organisms for obtaining food with improved properties.

Block V. Other applications: quality control in the food industry, waste utilization.

4. Academic activities

- Participative master classes: 42 hours.
- Special laboratory practices: 8 hours. Introductory session on sensory analysis and session on food processing and quality control, at the Food Science and Technology Pilot Plant.
- Seminars: 2 hours. Seminar given by professionals from the agri-food sector.
- Visits to companies: 8 hours. Visits to companies in the agri-food sector.

5. Assessment system

1. Continuous assessment: based on 3 written evaluation tests throughout the term:

- Block I (1st test, 25%)
- Block II (2nd test, 30%)
- Blocks III, IV and V (3rd test, 15%).

Written exams of theoretical-practical questions of brief development. A passing grade of 5/10 is required for each of them. The degree of knowledge, the adequacy of the answer, the ability to analyse and relate concepts, the correct use of technical terms and the correct use of language will be assessed.

2. Overall assessment

Similar to the continuous assessment, although activity A consists of a single written test corresponding to the whole of the program taught. The student who has not passed any of the written tests throughout the continuous assessment, should take the global test.

6. Sustainable Development Goals

- 2 - Zero Hunger
- 9 - Industry, Innovation and Infrastructure
- 12 - Responsible Production and Consumption