

30817 - Micro-biological analysis of food

Syllabus Information

Academic year: 2023/24

Subject: 30817 - Micro-biological analysis of food

Faculty / School: 105 - Facultad de Veterinaria

Degree: 568 - Degree in Food Science and Technology

ECTS: 6.0

Year: 2

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

The general objective of this subject is that the student is able to quantify, detect and identify microorganisms associated with food, using conventional analytical techniques (ISO reference methods) or other alternative techniques, in order to establish the microbiological quality of food.

These goals are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>), such that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement:

- Goal 3: Health and wellness.
- Goal 12: Responsible Production and Consumption

2. Learning results

- Is capable of handling with dexterity the sampling plans, as well as selecting, preparing and obtaining the sample units
- Knows how to safely handle sample units for microbiological analysis.
- Masters the methodology and techniques of food microbiological analysis in its main aspects (food, environment and handlers).
- Knows how to apply ISO standards, those recommended by international organizations or those established by the agri-food industry
- Is able to apply analytical methodologies and protocols developed in scientific papers or monographs in other languages, preferably in English, and interpret the results.
- Is able to elaborate a project / report, in a team, detailing the microbiological analysis, together with the chemical, physical and sensory analysis on a given raw material or processed product according to legal, technological and commercial criteria.

3. Syllabus

BLOCK 1. Sampling plans and regulations: Topic 1 (Two- and three-class sampling plans, phases of food microbiological analysis, Legal regulations and microbiological criteria)

BLOCK 2. Methodology and techniques in the microbiological analysis of food: Topic 2 (Traditional analytical techniques: microscopic or direct, plate (solid culture media), tube (liquid culture media). Topic 3 (Other microbial quantification and identification procedures)

BLOCK 3. Microbiological analysis: practical work on material preparation, sampling and dilutions, counts in solid media of microbial groups (bacterial and fungal), qualitative investigation of foodborne pathogens.

4. Academic activities

- **Master classes.** Theoretical sessions in which the contents of the subject are explained.

- **Laboratory practices.** The quantification and detection of microbial groups and species of interest will be carried out in a food item assigned by the teacher.

- **Problem solving and case studies.** Sessions aimed at research and interpretation of ISO methods, application of the legal regulations, interpretation of results and resolution of practical cases.

- **Teaching assignments.** Preparation of tutored work (integration project) on the microbiological analysis of a food assigned by the teachers.

5. Assessment system

The subject will be assessed in the global assessment modality by means of the following activities:

Test 1. Final written evaluation test of the theoretical sessions (50% of the grade). It will consist of 20 questions of short answer and closed multiple-choice tests (multiple choice). In the closed multiple-choice tests, incorrect answers will subtract half of the value of the same.

Test 2. Final evaluation written test of resolution of a practical case of microbiological nature that can arise in the food industry (30% of the grade). The methodological order, the accuracy of the procedures used and the ability to graphically present the work protocol will be valued.

Test 3. Evaluation of the written report and project presented and defended orally (20% of the grade) on the microbiological analysis of a food; this analysis will be carried out during the week of practical teaching and by subgroups of 3/4 students. The microbial parameters investigated, the techniques used, the interpretation of the results and the conclusions will be considered. Clarity, scientific rigor, synthesis capacity and relevance of the contents will be valued. The grade will be maintained for two academic years.

A minimum of 5 out of 10 will be required in all tests.

Students who have not submitted the written report, who have not presented and defended orally the project in group mode, or who waive the grade obtained, will have to submit individually a written report based on the microbiological results obtained in the practical sessions. It will be evaluated following the same criteria described for Test 3. They will contact the teachers to determine the topic of the work to be developed.

In the case of students who have not done the practices of the subject or who have missed any of the sessions without a justified cause, they must pass a laboratory exam in which they must demonstrate that they have achieved the skills and abilities by means of the correct performance of one of the laboratory practices proposed in the subject.