

68756 - Detection and evaluation of antimicrobial compounds in foods

Syllabus Information

Academic year: 2023/24

Subject: 68756 - Detection and evaluation of antimicrobial compounds in foods

Faculty / School: 105 - Facultad de Veterinaria

Degree: 631 - Master's Degree in Food Quality, Safety and Technology

ECTS: 3.0

Year: 1

Semester: First semester

Subject type: Optional

Module:

1. General information

The subject is fundamentally practical. In the theoretical sessions, the main natural compounds are presented, focusing on food preservation and safety. Their characteristics, mechanisms of action, methods of detection and the assessment of their antimicrobial activity and application in food are also introduced. In the practical sessions, students work in groups to obtain essential oils from aromatic seasonings and evaluate their antimicrobial activity *in vitro* and in a food matrix.

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

Objective 3: Health and well-being.

Objective 12: Responsible production and consumption.

2. Learning results

- To understand the fundamentals of screening and antimicrobial activity of the main compounds of natural origin.
- To know and apply the different techniques for the assessment of antimicrobial activity *in vitro* and in food matrices.
- To interpret, present and discuss the results obtained after the application of the method for determining the antimicrobial activity of the compounds tested in the laboratory.
- To express in oral and written form a critical analysis of scientific works that reflect the current situation on a topic related to the subject.

3. Syllabus

Theoretical teaching:

Topic 1. Introduction. Importance of natural compounds as food additives in the food industry. Classification.

Topic 2. General characteristics, mechanism of action and food applications of natural compounds of microbial (lactic acid bacteria, bacteriocins), vegetable (aromatic seasonings, essential oils, active principles) and animal (lysozyme, lactoferrin, lactoperoxidase) origin.

Practical teaching:

- Extraction of essential oils from aromatic plants by hydrodistillation.
- Assessment of the *in vitro* antimicrobial activity of several essential oils against pathogenic microorganisms of interest in food safety. Selection of the most effective ones and subsequent application to a food matrix.

4. Academic activities

Master classes: 4 hours.

Theoretical sessions in which the contents of the subject are explained.

Problem solving and case studies: 8 hours.

Oral presentation and discussion of practice reports and teaching assignments.

Laboratory practices: 18 hours.

Teaching assignments: 13.5 hours.

Preparation of practice reports and tutored work on topics related to the subject.

Personal study: 30 hours.

Assessment tests: 1.5 hours.

5. Assessment system

Continuous assessment

Test 1(60% of the grade, minimum 5 out of 10). Creation and oral presentation of an individual or group work on a topic related to the subject. The assessment criteria are: knowledge acquired on the fundamentals explained, scientific rigor of the work, bibliographic review, information contribution, personal opinion, structure and clarity in the writing, presentation and defence of the work.

Test 2(40% of the grade, minimum 5 out of 10). Preparation and oral presentation of a group report on the methodology, results and conclusions obtained from the practical sessions. The assessment criteria are: degree of application, skills and availability in the laboratory sessions. Quality of the written presentation, structure and content of the practice report. Ability to present, interpret and discuss the results and conclusions obtained.

Global assessment:

Students who have not chosen the continuous assessment modality or who have not passed any of the tests may be assessed by means of a global test that will consist of the same evaluation activities as those for the continuous assessment: written and oral presentation and defence of a paper on a topic related to the subject and a report on a practical case presented by the teachers.

The grading percentages for each activity and the assessment criteria will be the same for the global test and for the continuous assessment.