

63005 - Detection and evaluation of antimicrobial compounds in foods

Syllabus Information

Academic Year: 2019/20

Subject: 63005 - Detection and evaluation of antimicrobial compounds in foods

Faculty / School: 105 - Facultad de Veterinaria

Degree: 566 - Master's in Food Quality, Safety and Technology

ECTS: 3.0

Year: 1

Semester: First semester

Subject Type: Optional

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. The theoretical part presents the fundamentals for the detection and evaluation of the antimicrobial activity of the main naturally occurring compounds and their application in food. In the practice sessions, students test in the laboratory the study of the activity against different pathogens, both "in vitro" and in a food matrix. To do this, they have a detailed experimental protocol and the direct supervision of teachers.

The student participation will be encouraged with the presentation of the work done (results and conclusions) in the practice sessions.

4.2.Learning tasks

The course includes the following learning tasks:

- Lectures. Presentation of the foundations for the detection and evaluation of the antimicrobial activity of the main naturally occurring compounds and their application in food.
- Practice sessions. Students test, in the laboratory, the course contents against different pathogens, both "in vitro" and in a food matrix. To do this, they have a detailed protocol and the direct supervision of teachers.
- Assignment. Students draw up individually or in groups work on a topic related to the course, by the selection and interpretation of several current scientific literature. It is carried out under the supervision of a teacher.

- Seminars. Students present the results and conclusions of the practice sessions; as well as the presentation of the assignment. In these sessions, student participation is promoted, urging them to make a critical interpretation by using the teacher's examples.
- Tutorials. Individual or in groups, the teacher can monitor students' work, and solving questions, among other things.

4.3.Syllabus

The course will address the following topics:

Lectures (4 hours)

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

Topic 2. General characteristics, mechanism of action and applications of natural compounds in food.

- Antimicrobials of microbial origin: lactic acid bacteria, bacteriocins.
- Antimicrobials of vegetable origin: aromatic condiments, essential oils, active ingredients.
- Antimicrobials of animal origin: lysozyme, lactoferrin, lactoperoxidase.

Practice sessions in the laboratory (18 hours)

- Preparation of culture media and the necessary materials to carry out practice sessions.
- Extraction of essential oils from plant products by hydrodistillation.
- Evaluation of the antimicrobial activity "in vitro" of various essential oils from aromatic plants against pathogenic microorganisms of interest in food safety. Selecting the most effective antimicrobial for each pathogen and subsequent application to a food matrix.

Assignment

- A variety of topics will be proposed either by the teacher or by the students, related to the course. The assignment is made of a compilation and interpretation of several current scientific research on the selected topic. This work will be supervised by teachers, it will be made independently and will be submitted on the set date.

Seminars (8 hours in sessions of 2 or 3 hours)

- Each student group will present the approach and results of the work done in the laboratory; a sharing, discussion and conclusions will be held.
- Each student or student group presents the assignment and answers the possible questions raised by both teachers or students.

4.4.Course planning and calendar

The calendar of lectures and practice sessions is published throughout the month of September on the website of the Faculty of Veterinary <http://veterinaria.unizar.es/>

4.5.Bibliography and recommended resources

The literature of the academic year is kept updated and it can be consulted on the Library website (search biblioteca.unizar.es recommended bibliography).

- Antimicrobials in food / edited by P. Michael Davidson, John N. Sofos, A. L. Branen . - 3rd ed. Boca Raton, Florida [etc.]: Taylor & Francis, 2005
- Encyclopedia of food microbiology / editor-in-chief Richard K. Robinson; editors Carl A. Batt, Pradip D. Patel San Diego [etc.]: Academic Press, cop. 2000
- Natural antimicrobials for the minimal processing of foods / edited by Sibel Roller. Boca Ratón : CRC ; Cambridge : Woodhead Publishing Limited, cop. 2003