Universidad Zaragoza

Academic Year/course: 2023/24

68763 - Immunochemical techniques applied to food quality control

Syllabus Information

Academic year: 2023/24
Subject: 68763 - Immunochemical techniques applied to food quality control
Faculty / School: 105 - Facultad de Veterinaria
Degree: 631 - Master's Degree in Food Quality, Safety and Technology
ECTS: 3.0
Year: 1
Semester: Second semester
Subject type: Optional
Module:

1. General information

The objective of this subject is to provide the student with the fundamentals of the main immunochemical techniques, the general protocols to develop the techniques studied and to know their applications in food quality control. In the practical sessions, students will apply different types of immunochemical techniques in food analysis.

These approaches and objectives are aligned with some Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/en/), and certain specific goals, so that the acquisition of the learning results of the subject will contribute to some extent to the achievement of goals 4 (Quality education), 9 (Industry, innovation and infrastructure) and 12 (Responsible production and consumption).

2. Learning results

- To describe the main immunochemical techniques used in food quality control.
- To relate the fundamentals of the different types of immunochemical techniques with their practical applications.
- To plan a procedure to carry out the development of an immunochemical technique and apply it in the laboratory.
- To understand and interpret an immunochemical method described in a research article in order to be able to apply it in food quality control.

3. Syllabus

THEORETICAL CLASSES

Topic I. Introduction. Obtaining polyclonal and monoclonal antibodies. Antibody purification techniques.

Conjugation of antibodies with marker molecules. Characterization of conjugates.

Topic II. Types of immunochemical techniques. Precipitation techniques. Agglutination techniques. Techniques of enzyme immunoassay: immunodotting, ELISA techniques, Western-blotting. Immunochromatography technique. Immunosensors.

Topic III. Applications of immunochemical techniques in food quality control. Determination of chemical and biological contaminants. Detection of allergens and transgenic foods. Detection of frauds by species substitution.

4. Academic activities

- Participative master class: 12 hours

The contents of the subject will be presented, with a practical orientation to food quality control.

- Laboratory practices: 14 hours

Precipitation, immunodotting, western-blotting, ELISA and immunochromatography applied to food quality control will be practiced.

- Seminar: 1.5 hours

Group oral presentation of the results and conclusions of the practical sessions.

- External visit to a biotechnology company: 1.5 hours

- Evaluation tests: 1.5 hours

5. Assessment system

Continuous assessment

The subject will be evaluated in the continuous assessment mode by means of the following activities:

Written test on theoretical teaching (50% of the grade, minimum 5 out of 10)

It will consist of 5 open-ended questions. The adequacy of the answer to the question, the capacity of summarising, as well as clarity and coherence in the reasoning will be assessed

Assessment of practical teaching (50% of the grade, minimum 5 out of 10)

There will be several laboratory practices distributed throughout the term. The following aspects will be assessed:

- Laboratory skills and abilities
- Deepening in practice
- Student autonomy and participation
- Group oral presentation of the results and conclusions of the practical activities.

Overall test

If the student has not successfully passed any of these assessments during the semester, they will have the opportunity to pass the

subject by means of a global test, which will consist of the same activities as those in the continuous assessments, in the two official calls.