Universidad Zaragoza

Year : 2019/20

63014 - Immunochemical techniques applied to food quality control

Syllabus Information

Academic Year: 2019/20
Subject: 63014 - Immunochemical techniques applied to food quality control
Faculty / School: 105 - Facultad de Veterinaria
Degree: 566 - Master's in Food Quality, Safety and Technology
ECTS: 3.0
Year: 1
Semester: Second 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 learning process designed for this course consists of 12 hours of lectures and 15 hours of laboratory practice sessions.

- Lectures will be taught in sessions of 1-2 hours and the participation of students will be encouraged. Topic I includes the obtention of antibodies (polyclonal and monoclonal), and the techniques for the purification and conjugation of them. This knowledge is essential because antibodies are the main components of any immunochemical technique. Topic II deals with the different types of immunochemical techniques and the different formats indicating the advantages and disadvantages of them. In topic III, the application of immunochemical techniques in food quality control is reviewed. In some of the sessions, the lecturer will show videos and webpages. Classroom materials, including lectures' presentations and some supplementary material, will be available in advance via the virtual platform ADD (Moodle).

- Practice sessions will take place in the laboratory, in sessions of 3-4 hours. Each class group will be divided into smaller groups so that everyone can carry out the experimental work simultaneously. Students will have the protocols previously on the ADD to prepare practices. At the beginning of each session, the teacher will explain the needed theoretical contents and instructions to follow during the experiments.

4.2.Learning tasks

The course includes the following learning tasks:

- Lectures will provide students with the theoretical knowledge of the fundamentals and types of immunochemical techniques that are necessary to carry out the other learning tasks.
- In the practice sessions, which will be given after the corresponding lectures, students will be able to apply the different techniques in the food quality control.
- Students have to prepare a brief individual written report including results and their discussion, as well as an oral presentation in group in which their participation will be promoted to make a critical interpretation of the obtained results.

4.3.Syllabus

The course will address the following topics:

Lectures

Topic I. Introduction. Obtaining polyclonal and monoclonal antibodies. Antibody purification methods. Antibody conjugation techniques and characterization of conjugates.

Topic II. Types of immunochemical techniques. Precipitation techniques. Aglutination techniques. Enzymatic immunoassay: immunodotting and ELISA techniques. Western-blotting. Lateral flow. Immunosensors.

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

Practice sessions

Laboratory session 1. Precipitation techniques: double immunodiffusion, radial immunodiffusion. Immunoelectrophoresis.

Laboratory session 2. Immunodotting and immunotransfer techniques. Titration curve of antisera.

Laboratory session 3. Indirect competitive ELISA technique. Sandwich ELISA technique. Lateral flow.

4.4.Course planning and calendar

Further information concerning the timetable, classroom, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Faculty of Veterinary website http://veterinaria.unizar.es/.

Visits during office hours will be agreed previously with the teachers.

4.5.Bibliography and recommended resources

Bibliography of the academic year is updated and looked up by the Library webpage. Recommended bibliography at: https://biblioteca.unizar.es/