Universidad Zaragoza

Year : 2020/21

30817 - Micro-biological analysis of food

Syllabus Information

Academic Year: 2020/21
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

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 content of this course includes the knowledge and application of reference methods and other rapid alternative methods of analysis of food,water,and environment.

In the practice sessions, students will developing the laboratory the different methodologies for quantification, detection and identification of pathogenic microorganisms in food; as well as different microbial groups in water and environment samples.Todo this,they will have the detailed experimental protocol stages the processand the direct supervision of theteachers.

During the course work presentation sessions, the student participation is encouraged, urging them to make a critical interpretation of them.

Students must follow the regulations described in:

- Prevention: A guide for students at the University of Zaragoza: http://uprl.unizar.es/publicaciones/estudiantes_ingles.pdf
- Manual de seguridad en los laboratorios de la Universidad de Zaragoza y normas marcadas por la Unidad de Prevención de Riesgos Laborales: http://uprl.unizar.es/seguridad/pdfs/seglaborUZ.pdf http://uprl.unizar.es/seguridad/pdfs/laboratorios.pdf

In addition, students will follow as well any instructions related to biosecurity given by the professor

4.2.Learning tasks

The course includes the following learning tasks:

- Lectures. In these sessions, the reference methods for microbiological analysis of food,water and surfaces are presented; as well as the fundament and application of rapid alternative methods of microbiological food analysis.
- Practice sessions. Students do the analysis of different matrices by reference ISO and alternative methods
- Group assignment**.** Students prepare in group an assignment on topics of interest under the supervision of the teachers.
- Seminars**.** Students will present and defend their group assignments,which will be followed by a discussion.
- Individual or group tutorials. The teacher will be able to supervise the students' assignments and to answer any questions arising during its development.

4.3.Syllabus

The course will address the following topics:

Topic 1: SAMPLING PLANS AND REGULATIONS. One of the fundamental objectives of food legislation is to ensure a high level of consumer protection. To contribute to the protection of public health and avoid differences in interpretation, it is necessary to establish sampling programs and harmonized safety criteria on the acceptability of food, in particular as regards the presence of pathogenic microorganisms. Microbiological criteria also give guidance on the acceptability of foodstuffs and their manufacturing, handling and distribution and should be part of HACCP, as well as other hygiene control measures.

- **Theoretical teaching**
  - Phases of food microbiological analytical for sampling plans of two and three classes.
  - Legal normative and microbiological criteria.
- **Teaching and learning activities (0.5 ECTS)**
  - Lectures: 6 hours
  - Independent work of student : 10 hours

Topic 2: METHODOLOGY AND TECHNIQUES FOR FOOD MICROBIOLOGICAL ANALYSIS. In this part, the usual methodology used in reference laboratories is exposed along with some methodological advances that are intended to be more accurate, thorough and faster. The food analysis aimed at quantitative and qualitative research of microorganisms present therein, helps to estimate, among other things, the usual microbiota (microbial typing), the period of commercial life (predictive microbiology), the hygienic quality or alteration of food. Also, the study of all that is involved and comes into contact with the food during its preparation, harvest and marketing: surfaces facilities, materials and equipment, environment, handlers, etc.

- **Theoretical teaching**
  - Obtaining the analytical sample.
  - Direct or microscopic analytical techniques.
    - Traditional analytical techniques plate count. Traditional analytical techniques counting tube (NMP).
  - Automation of traditional analytical techniques.
  - Other methods of microbiological research: physical, chemical, enzymatic, immunological and biological.
- **Teaching and learning activities (1.5 ECTS)**
  - Lectures: 14 hours
  - Independent work of student: 24 hours

Topic 3: MICROBIOLOGICAL ANALYTICAL. This Topic should serve at students to acquire skills in sampling that train them in the development of the methodology for counting spoilage microorganisms and allow them the detection of the most common foodborne pathogens. Also they have the opportunity to implement other non-traditional methodologies.

- **Practical teaching**
  - Given the practical nature of the course, with a large teaching load (40 hours), it has been considered appropriate to include a third Topic where it is specified and explained the practices envisaged and the delivery of the same
  - Practical teaching will be held for one week from Monday to Friday (4 hours daily).
  - Each subgroup (established in the previous week) should analyze one food. They will have to determine the legal normative for applied and microbiological sampling plans; Also, they must carry out the appropriate microbiological analysis to verify that they comply with this legal normative. By teachers will be advised in this task and may be included additional microbiological criteria.
  - This practical work will be integrated with other practical work that evaluate aspects of food quality or process and constitute part of the practical teachings of the courses: Chemical analysis of food and

Physical and sensory analysis of food. Students will undertake a job and will present to teachers both analytical performed, results obtained as the interpretation thereof and main conclusions.

- **Teaching and learning activities (2. 0 ECTS)**
  - Practical teaching: 20 hours
  - Independent work of student: 18 hours plus 22 hours used for the preparation and presentation of the microbiological study of the integration project

Topic 4: PROBLEM SOLVING AND CASES. Seminar aimed to problems and practical cases solving that may be generated in the food industry and in the field of microbiological analysis

- **Teaching and learning activities (2. 0 ECTS)**
  - Seminar: 20 hours
  - Independent work of student: 8 hours

4.4.Course planning and calendar

The dates and milestones of the course are described in detail along with the other courses in the second year in the degree of Food Science and Technology, on the website of the Faculty of Veterinary (link: http://veterinaria.unizar.es/gradocta/). This link will be updated at the beginning of each academic year.

4.5.Bibliography and recommended resources

The updated bibliography is incorporated through the Library Center and can be accessed by the web.