# 30813 - Food Microbiology

**Información del Plan Docente**

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| **Academic Year** | 2018/19 |
| **Subject** | 30813 - Food Microbiology |
| **Faculty / School** | 105 - Facultad de Veterinaria |
| **Degree** | 568 - Degree in Food Science and Technology |
| **ECTS** | 6.0 |
| **Year** | 2 |
| **Semester** | First 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 the achievement of the learning objectives. The learning process that is designed for this subject is based on the following:

A teaching program of 40 lectures and 20 hours of laboratory practices.

Regarding lectures, students will have in advance the documents of each theoretical block in terms of students become familiar with the exposed issues.

As in the theoretical teaching, students will have in advance the protocols of practices; each of the established practice sessions will be staggered in four phases: explanation of the practices performed during the session, preparation of materials and equipment, conducting the analytical with selected matrices and obtaining and verifying the results. In the same way, the fact of establishing subgroups allow us to compare the results.

## 4.2.Learning tasks

The course includes the following learning tasks:

- Lectures. Attendance to lectures where the documentation is given to the student in advance.
- Practice sessions. Performing of laboratory practices where protocol is also given in advance. The discussion and interpretation of the results obtained in function of the different analyzed foods and that is carried out at the end of each practice session is key to the student learning.
- Autonomous work and study.
- Assessment tasks. Preparation and presentation of a written work on the microbiological profile of a food assigned and supervised by the teachers.

## 4.3.Syllabus

The course will address the following topics:

- **BLOCK 1: MICROBIAL ECOLOGY OF FOOD.** The foods that humans consume are from animal, vegetable and fungal origen. Therefore, it will be necessary to know both microorganisms present in raw material and its ambient and everyone that can contaminate them along the entire chain food (transformation and/or commercialization). Some of the defense mechanisms (intrinsic parameters) that plants and animals have developed against proliferation of microorganisms, remain active even in fresh food. Also, it must be add the environmental characteristics where aliments are stored (extrinsic parameters) and affect both food and microorganisms cointained in them. The joint action of these mechanisms will be that avoid the food microbial alteration and foodborne pathogenic proliferation.
- **Theoretical teaching**
  - Action, origen and taxonomy of microorganisms present in food.
  - Intrinsic factors that influencing the microbial growth.
  - Extrinsic factors that influencing the microbial growth.
  - Implicit factors that influencing the microbial growth.
  - Treatment and processed factors that influencing the microbial growth.
- **Practical teaching**
  - Influence of intrinsic and extrinsic factors on food microbiota.
  - Influence of decontaminating physical agents (UV-C) on pathogenic microorganisms survival.
- **Teaching and learning activities (2.3 ECTS)**
  - Lectures: 15 hours
  - Laboratory practices: 8 hours
  - Independent work of student : 33 hours
- **BLOCK 2: MICROBIOLOGY OF FOOD FERMETATIONS**
  - Fermentations of raw food materials are examined as methods of production and conservation of new aliments. Thus, it will be studied the role played for each participant microorganism.
- **Theoretical teaching**
  - Microorganisms with technological interest: quantification, identification and metabolic activity.
  - Fermented food of animal origen: dairy and meat products.
  - Fermented food of vegetable origen: bakery product, alcoholic beverages (beer, wine, cider and distillates), vinegars and pickles.
- **Practical teaching**
  - Quantification and viability of yeasts in ferments used in the bakery industry.
  - Research and quantification of microbiota in fermented food of animal and vegetal origen.
- **Teaching and learning activities (1.6 ECTS)**
  - Lectures: 11 hours

    - Laboratory practices: 5 hours
    - Independent work of student : 23 hours
- **BLOCK 3: BIODETERIORATION AND FOODBORNE PATHOGENIC MICROORGANISMS**
    - Knowing the pathogenic and spoilage microbiota that can be potentially presented in different groups of food, as well as the ecologic parameters which influence on this microflora and permit its control, avoiding thus its undesirable action.
- **Theoretical teaching**
    - Food microbiology of animal origen: meat and meat products, fish products, milk and dairy products, eggs and egg products.
    - Microbiology of fruit and vegetable.
    - Food microbiology of IV and V range products.
    - Microbiology of canned food.
    - Microbiology of water and drinks.
    - Predictive microbiology: definition, objectives and applications.
- **Practical teaching**
    - Assays to verify the degree of microbial contamination of surfaces and environment.
    - Detection of pathogenic and spoilage food microorganisms.
- **Teaching and learning activities (2.1 ECTS)**
    - Lectures: 14 hours
    - Laboratory practices: 7 hours
    - Independent work of student : 30 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.