

# 30817 - Micro-biological analysis of food

## Syllabus Information

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**Academic Year:** 2019/20

**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 the achievement of the learning objectives. A teaching program of 20 lectures, 20 hours of laboratory practices, 20 hours of practical cases and the development and presentation of a group assessment with the courses of "Chemical analysis of food" and "physical and sensory analysis of food"; this assessment will be drawn up collectively by the subgroups formed.

The laboratory practice sessions will be conducted daily in four hours (16 to 20 h) for one week. Seminars of practical cases will be held in five sessions of four hours, once completed the theoretical teaching (Block 1).

In the practical teaching, students themselves produce in advance of the protocol of practices; adapted to the analysis of a determined food and know well in advance as well as the 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 obtained.

### 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 for one weeks; for practical activities the students are themselves who according to the analyzed food design the protocol and the corresponding schedule, with the advice of teachers. 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 of a report with microbiological analyzes carried out and results obtained during practice teaching.
- Seminars. Attendance at seminars where practical cases of the food industry will be presented to the students and resolved.

### 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/gradocla/>). 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.

Allaert Vandevenne, Corrie. Métodos de análisis microbiológicos de alimentos / Corrie Allaert Vandevenne, Marta Escolá Ribes . [Madrid] : Díaz de Santos, D.L. 2002

Análisis microbiológico de alimentos y aguas : directrices para el aseguramiento de la calidad / editores : N. F. Lightfoot, E. A. Maier . Zaragoza : Acribia, 2002

Análisis microbiológico de carne roja, aves y huevos / editor, G.C. Mead ; traducción a cargo de Blas Borde Lekona Zaragoza : Acribia, imp. 2009

Compendium of methods for the microbiological examination of foods / edited by Frances Pouch Downes, Keith Ito . 4th ed. Washington, D.C. : American Public Health Association, cop. 2001

Jarvis, Basil. Statistical aspects of the microbiological examination of foods / Basil Jarvis . 2nd ed. Amsterdam : Elsevier Science & Technology, 2008 [Para acceder al texto completo mirar URL]

Manual práctico de microbiología / [editores], Carlos Gamazo, Ignacio López-Goñi, Ramón Díaz ; [autores, Begoña Alonso-Urmeneta] . 3ª ed. Barcelona : Masson, 2005

Microbiologie alimentaire : techniques de laboratoire / coordonné par Jean-Paul Larpent . Paris [etc.] : Technique & Documentation, 1997

Microorganismos de los alimentos. 7, Análisis microbiológico en la gestión de la seguridad alimentaria / ICMSF (International Commission on Microbiological Specifications for Foods) ; [traducción realizada por José Antonio Ordóñez Pereda, Miguel Angel Asensio Pérez, Gonzalo D. García de Fernando Minguillón] . Zaragoza : Acribia, D.L. 2004

Microorganismos de los alimentos. V. 1, Su significado y métodos de enumeración / Patrocinado por The International Commission on Microbiological Specifications for Foods of the International Association of Microbiological Societies ; [traducido por B. Moreno ... ( et al.)] . 2a ed., [reimpr.] Zaragoza : Acribia, D.L. 2000

Microorganismos de los alimentos. V. 1, Técnicas de análisis microbiológico / patrocinado por The International Commission on Microbiological Specifications for Foods of the International Association of Microbiological Societies . 2ª ed. Zaragoza : Acribia, D.L. 1983

Microorganismos de los alimentos. V. 2, Métodos de muestreo para análisis microbiológicos : principios y aplicaciones específicas / Patrocinado por the International Commission on Microbial Specifications for Foods of the International Association of Microbiological Societies ; traducido por Juan Antonio Ordóñez Pereda . 2ª ed. Zaragoza : Acribia, D.L. 1999

LISTADO DE URLs:

Statistical aspects of the microbiological examination of foods / Basil Jarvis - [http://www.sciencedirect.com/science/book/9780444530394]