



Universitat de Lleida

# DEGREE CURRICULUM **HYGIENE IN FOOD PROCESSING**

Coordination: ALEGRE VILAS, ISABEL

Academic year 2023-24

## Subject's general information

<b>Subject name</b>	HYGIENE IN FOOD PROCESSING			
<b>Code</b>	100611			
<b>Semester</b>	2nd Q(SEMESTER) CONTINUED EVALUATION			
<b>Typology</b>	<b>Degree</b>	<b>Course</b>	<b>Character</b>	<b>Modality</b>
	Bachelor's Degree in Human Nutrition and Dietetics	2	COMPULSORY	Attendance-based
	Double bachelor's degree: Degree in Human Nutrition and Dietetics and Degree in Physiotherapy	3	COMPULSORY	Attendance-based
<b>Course number of credits (ECTS)</b>	6			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	<b>PRALAB</b>	<b>PRAULA</b>	<b>TEORIA</b>
	<b>Number of credits</b>	2	1	3
	<b>Number of groups</b>	3	2	1
<b>Coordination</b>	ALEGRE VILAS, ISABEL			
<b>Department</b>	FOOD TECHNOLOGY, ENGINEERING AND SCIENCE			
<b>Teaching load distribution between lectures and independent student work</b>	Contact hours: 60 - Lectures: 30 - Lab: 20 - Seminar: 10  Non-contact hours: 90			
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.			
<b>Language</b>	Catalan (100 %)			
<b>Distribution of credits</b>	Lectures: 3 Laboratory: 2 Seminar: 1			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
ALEGRE VILAS, ISABEL	isabel.alegre@udl.cat	10	
COLAS MEDA, MARIA DEL PILAR	pilar.colas@udl.cat	0	
TORRES GRIFO, MERCE	merce.torres@udl.cat	1	

## Subject's extra information

Hygiene in food processing is a core subject in the Degree in Human Nutrition and Dietetics taught in the second year during the second quarter. This subject matter has been subdivided in two major parts: hazards in foods and foodborne diseases (Part I), and hygiene facilities, processes and handlers (Part II).

## Learning objectives

1. The concept of food hygiene
2. Recognize the main bacterial agents, viral and fungal-related foodborne illness, determine what control measures have been implemented to avoid them, and plan how to analyze them.
3. Assess the toxicology of chemicals that can be natural food components or may be added accidentally or intentionally to food in the process of industrial development.
4. Classify the cleaning and disinfection methods, and the handler's role observing hygienic measures and applying them in food establishments.
5. Specify the hygienic requirements of premises, equipment, and tools work, and how to solve their control.
6. Integrate good hygiene practices.

Objective	Activities	Classroom	Student learning
1-6	Lectures	30	45
1-2, 4-5	Practices	20	25
1-6	Seminars	10	20
	<b>Total</b>	60	90

\***Student learning** = Contact hours + hours student work

## Competences

### Specific competencies

CE15 Develop, apply, evaluate and maintain adequate hygiene practices, food safety and risk control systems, applying current legislation.

CE16 Participate in the design, organization and management of the different food services.

## **General Competencies.**

CG2. Develop the profession with respect to other health professionals, acquiring skills to work in a team.

CG3. Recognize one's own limitations and the need to maintain and update one's professional competence, with special recognize one's own limitations and the need to maintain and update professional competence, giving special importance to learning, in an autonomous and continuous way, new knowledge, products and techniques in nutrition and food, as well as motivation for quality.

CG4. Communicate effectively, both orally and in writing, with people, health professionals or industry and the media, knowing how to use information and communication technologies, especially those related to nutrition and lifestyle habits.

CG5. Know, critically evaluate and know how to use and apply the sources of information related to nutrition, food, lifestyles and health aspects.

GC6. Know the limits of the profession and its competences, identifying when interdisciplinary treatment or referral to another professional is necessary.

## **Basic competences**

CB1 Students have to demonstrate to possess and understand knowledge in an area of study that starts from the basis of general secondary education, and is usually at a level that, although it is supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study.

CB2 The students have to know how to apply their knowledge to their work or vocation in a professional manner and possess the competencies and the skills that are usually demonstrated through the development and defense of arguments and problem solving within their field of study.

CB3 That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical issues.

CB4 The students have to be able to transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.

CB5 The students have to developed those learning skills necessary to undertake further studies with a high degree of proficiency undertaking further studies with a high degree of autonomy.

## **Transversal Competences of the UdL**

CT1 To have a correct oral and written expression

## Subject contents

### LECTURES

#### **Part I.- HAZARDS IN FOODS AND FOODBORNE DISEASES**

1. INTRODUCTION. Definition of food hygiene and historical development. Current situation. Hygiene of food in the European Union. The alimentary Code.
2. FOOD DISEASES. POISONING. Food illnesses. Food bacterial disease etiology. Definition of food toxi-infection (TIA). Importance of TIA in the world. Etiology and contributing factors of TIA in Catalonia.
3. GRAM-NEGATIVE BACTERIA INVOLVED IN FOODBORNE DISEASES: *Salmonella*; *Shigella*; *Escherichia coli* pathogen; *Yersinia enterocolitica*; *Vibrio* sp; *Campylobacter*. Characteristics. Reservoir and source of infection. Survival in food. Pathogenesis. Infecting dose. Incubation period and transferability. Clinical and microbiological diagnosis. Treatment. Control.
4. GRAM-POSITIVE BACTERIA INVOLVED IN FOODBORNE DISEASES: *Staphylococcus aureus*; *Clostridium botulinum* and *Clostridium perfringens*; *Bacillus cereus*; *Listeria monocytogenes*. Characteristics. Reservoir and source of infection. Survival in food. Pathogenesis. Infecting dose. Incubation period and transferability. Clinical and microbiological diagnosis. Treatment. Control.
5. VIRUS. Virus diseases associated with food: hepatovirus and enterovirus group SRSV, rotavirus and astrovirus. Reservoir and source of infection. Survival in food. Pathogenesis. Infecting dose. Incubation period and transferability. Clinical and microbiological diagnosis. Treatment. Control. Problem of the detection and quantification in food.
6. MOLDS AND MYCOTOXINS. Introduction. The secondary metabolism in fungi: mycotoxins. The genus *Aspergillus*. Main mycotoxins. The genus *Penicillium*. Main mycotoxins. The genus *Fusarium*. Main mycotoxins. Control mechanisms.
7. CHEMICAL AND PHYSICAL HAZARDS IN FOOD. Natural chemical components of food. Xenobiotic compounds. Toxic food processing. Physical hazards.

#### **Part II. HYGIENE FACILITIES, PROCESSES AND HANDLERS**

8. PLANNING, ORGANIZATION AND SUPERVISION OF THE PREMISES AND INSTALLATIONS. Basic needs. Construction and design. Floors, walls, ceilings, drains, pipes, doors and windows. Ventilation. Illumination. Manipulations of nutritional substances. Disposal and integration of different areas.
9. HYGIENIC ASPECTS OF FOOD PROCESSING EQUIPMENT. The requirements of equipment. Sanitary design principles. Building materials equipment. Details of the design of some equipment.
10. PERSONAL HYGIENE. Food handler. Specifications on personal hygiene. Staff training. Work safety.
11. PEST CONTROL. Main pests in food premises. Pest control: techniques of exclusion or preventive measures; Removal techniques. Plan pest control: surveillance plan; controls.
12. WATER SUPPLIES. Water uses. Potable water. Non-potable water. Water control plan.
13. CLEANING. Introduction. Factors to consider in the cleaning process. Characteristics of the dirt. Surfaces to be cleaned. Detergents. Cleaning type. Cleaning efficiency. Importance in waste disposal: biofilms.
14. DISINFECTION. Introduction. Types of disinfection. Disinfectants: main properties; choosing them; factors influencing their effectiveness; type. Use of the disinfectants. Action about microorganisms.

15. CLEANING AND DISINFECTION PROGRAM. Introduction. Inspection of facilities. Equipment. Type, application, frequency and dosage of the products used. C + D routine for each area of work, zone or equipment and to each operator. Mistakes in the program. Monitoring of cleaning and disinfection.

16. HYGIENIC ASPECTS OF FOOD ESTABLISHMENTS. Retail stores. Supermarkets. Bars. Restaurants. Kitchens. Catering. Other.

## **PRACTICES:**

- 1.- Enumeration of *Bacillus cereus* in food
- 2.- Enumeration of *Clostridium perfringens* in food
- 3.- Detection of *Salmonella* in food
- 4.-Detection of *Listeria monocytogenes* in food
- 5.- Hygiene of handlers
- 6.- Transmission of the contamination
- 7.- Control of surfaces contamination
- 8.- Environmental control

## Methodology

Activity	Objective	Description
Lectures	All objectives and competences	Items 1 to 15
Tutorial		
Lab practices	All competences and objectives 1,2,4,5	Practices 1 to 8. Pathogens in food. Analysis of contamination of surfaces and handlers
Seminars and works	All objectives and competences	<p>Items with case studies</p> <p><b>1 Work</b> in groups of four students, who prepare and present orally: aspects of hygiene and handlers from a alimentary establishment (Item 16)</p>

## Evaluation

The evaluation of the subject is divided into 3 blocks:

### Block 1. Theory (50%)

This block will consist of two evaluation activities:

- Exam 1 (Foodborne hazards and foodborne diseases): 35%
- Exam 2 (Hygiene in facilities, processes, and handlers): 15%

To pass the subject, a grade equal to or greater than 5.0 is required in this block.

### Block 2. Seminars (20%)

The evaluation of this block will be carried out through the realization and/or presentation of different practical classroom activities and works. Failure to carry out the activities and/or presentations in the established class schedule will mean obtaining a grade of zero in that activity. Failure to attend scheduled classes without accredited justification will result in a penalty of 0.1 points/hour on the overall grade of the subject.

### Block 3. Practical sessions (30%)

The evaluation of laboratory practices will consist of:

- Activities to be presented during the practical session (10%).
- Exam (20%).

Failure to attend the practices at the scheduled time without accredited justification will suppose a penalty of 0.1 points/hour on the overall grade of the subject.

### Passing the subject:

To pass the subject it is essential to obtain a score equal to or greater than 5 in block 1 (theory) and obtain a score equal to or greater than 5 in the overall grade.

If block 1 is not passed, but the overall grade of the subject is equal to or greater than 5.0, fail (4.9) will be recorded in the record.

### Alternative evaluation:

The alternative evaluation of the subject will consist of:

- Theory exam (70%): the examination of the theory of the subject will be carried out on the date foreseen for the exam of recovery of the continuous evaluation. If this test is not passed, there will be the option of a recovery exam. To pass the subject, a grade equal to or greater than 5.0 is required in this exam.
- Laboratory practices (30%): the evaluation will consist of the delivery of activities during the realization of the practices (10%) and a written exam (20%). Failure to attend the practices at the scheduled time without accredited justification will suppose a penalty of 0.1 points/hour on the overall grade of the subject.

If the theory exam is not passed, but the overall grade of the subject is equal to or greater than 5, a fail (4.9) will be recorded in the record.

### Copying and plagiarism:

In case of detecting copy and/or plagiarism during the performance of the evaluation activities, the activity will be withdrawn, and it will be suspended. It may also involve the opening of disciplinary proceedings.

## Bibliography

### ***Textbooks***

- CAMEÁN, AM i REPETTO, M. (2007). Toxicología alimentaria. Díaz de Santos, Madrid. -ebook
- FORSYTHE, S.S. i HAYES, P.R. (2002). Higiene de los alimentos, microbiología y HACCP. 2ª edición. Acribia, Zaragoza.
- ICMSF (1998). Microorganismos de los Alimentos. Vol. 5: Características de los patógenos microbianos. Acribia, Zaragoza.
- MONTES, E., LLORET, I. i LÓPEZ, M.A. (2018). Diseño y gestión de cocinas. Manual de higiene alimentaria aplicada al sector de la restauración. 3a edició. Díaz de Santos, Madrid.
- PASCUAL, M.R. (2005). Enfermedades de origen alimentario. Díaz de Santos, Madrid.

### ***Additional bibliography***

- AGÈNCIA CATALANA DE SEGURETAT ALIMENTÀRIA (ACSA) <http://acsa.gencat.cat>
- AAGENCIA ESPAÑOLA DE SEGURIDAD ALIMENTARIA Y NUTRICION  
[https://www.aesan.gob.es/AECOSAN/web/subhomes/seguridad\\_alimentaria/aecosan\\_seguridad\\_alimentaria.htm](https://www.aesan.gob.es/AECOSAN/web/subhomes/seguridad_alimentaria/aecosan_seguridad_alimentaria.htm)
- HUI, Y.H., PIERSON, M.D., GORHAM, J.R. (2018), Foodborne disease handbook. 2a edició. Vol 1: Bacterial Pathogens. CRC Press, Boca Raton
- LEVEAU, J. i BOUIX, M. (2002). Manual técnico de higiene, limpieza y desinfección. AMV Ediciones/Mundi-Prensa, Madrid.
- MCLAUCHLIN, J. i LITTLE, C. (2007). Hobbs' food poisoning and food hygiene. 7a edició. Hodder Arnold, London.
- MOLL, Manfred i MOLL, Nicole. (2006). Compendio de riesgos alimentarios. Editorial Acribia, Zaragoza.
- SPRENGER, R.A. (2017). Hygiene for management. A text for food safety courses. 19a ed. Highfield.CO.UK Limited, Doncaster, UK.