



Universitat de Lleida

DEGREE CURRICULUM  
**HYGIENE IN FOOD  
PROCESSING**

Coordination: SALA MARTI, NURIA

Academic year 2020-21

## 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>	Degree	Course	Character	Modality
	Bachelor's Degree in Human Nutrition and Dietetics	2	COMPULSORY	Attendance-based
	Double bachelor's degree: Degree Physiotherapy and Degree in Human Nutrition and Dietetics	3	COMPULSORY	Attendance-based
<b>Course number of credits (ECTS)</b>	6			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	PRALAB	PRAULA	TEORIA
	<b>Number of credits</b>	2	1	3
	<b>Number of groups</b>	6	3	2
<b>Coordination</b>	SALA MARTI, NURIA			
<b>Department</b>	FOOD TECHNOLOGY			
<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 Spanish English			
<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	
SALA MARTI, NURIA	nuria.sala@udl.cat	8,5	
TORRES GRIFO, MERCE	merce.torres@udl.cat	2,5	

## 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 groups: hazards in foods and foodborne diseases (Block I), and hygiene facilities, processes and handlers (Block 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 role of handler observing hygienic measures and apply it 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

1. Good practices of hygiene, food safety and risk control systems: elaboration, application, evaluation and maintenance, applying current legislation

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

## Subject contents

### LECTURES

#### **Block 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.

#### **Bloc 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

<p><b>Seminars and works</b></p>	<p><b>All objectives and competences</b></p>	<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>
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## Evaluation

Exam 1 (Block I): 25% (a minimum score is required to AVERAGE 4)

Written work (Block II): 20% (a minimum score is required to AVERAGE 4)

Theory questions (Bloc II): 15% (answers to the proposed questions and cases will be evaluated)

Practices: 20% (compulsory for passing the subject): presence and do a report

Seminars: 20% (do some works: write and oral explaining)

Questions, seminars and practices count when a minimum of 4 have been taken in exam and the work of block II.

If compliance with the requirements for AVERAGE, surpasses the evaluation with grade  $\geq 5$ .

## 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.