

Food Technology

Code: 102610
ECTS Credits: 6

Degree	Type	Year	Semester
2502445 Veterinary Medicine	OB	2	A

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Montserrat Mor-Mur Francesch
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Jaume Prat Castellà
Bibiana Juan Godoy
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Prerequisites

There are no prerequisites for taking this course. However, in order to ensure the proper achievement of the learning aims, it is recommended that students have basic knowledge about physics, chemistry, microbiology, and food science.

It is common to use sources of information in English and it is recommended that students have a good knowledge of this language.

Objectives and Contextualisation

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The subject (materia) Food Science and Technology, which is taught in the 2nd year of the degree, provides a part of the specific competences that veterinarians have to acquire during their training, since, according to Order ECI /333/2008; which establishes the requirements for the verification of official university degrees that qualify for the exercise of the Veterinary profession. The first competence that graduates in Veterinary Medicine must have acquired, is the control of the hygiene, the inspection and the technology of the production and elaboration of foods for human consumption, from the primary production to the consumer.

The contents of "Food Technology" is made up of two courses. In the first semester, Food Science is studied, in which the student must acquire the knowledge, theoretical and practical, about the characteristics,

composition and alteration of foodstuffs for human consumption. In the second semester, Food Technology is studied, which acquires the foundations and principles of the technologies used to obtain healthy and safe foods.

Training objectives

At the end of the subject of Food Technology, students will be able to:

- Describe basic operations applied to food industries.
- Establish flow diagrams typical of the food industry.
- Describe the main process of transformation and / or conservation of foods, the consequences they have on the
- Identify the main characteristics of food industries derived from raw materials of animal origin.

Competences

- Apply food technology to the preparation of food for human consumption.
- Demonstrate knowledge of the rights and duties of the veterinarian, with a special focus on ethical principles
- Seek and manage information related with professional activity
- Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

Learning Outcomes

1. Analyse the processes used in the food industry for the conservation, transformation, storage and transport of foods.
2. Apply knowledge of basic sciences to food technology.
3. Identify and interpret the basic operations used in food industries to be able to program food conservation and/or transformation processes.
4. Seek and manage information related with professional activity
5. Specify quality criteria while taking into account the real functions of the food industry.
6. Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

Content

The subject consists of 2 units, whose contents are distributed in face-to-face activities of theory, practicals (laboratory and pilot plant), seminars and discussion of cases.

UNIT I. Basics of food industries

Theoretical classes

Topic 1. Processes and basic operations in food technology. Flow diagrams. Discontinuous and continuous processes. Description of the main processes and equipment used in the food industry.

Topic 2. Introduction to chilled foods. Industrial refrigeration and systems for chilling and freezing in the food industry. Characteristics and selection of cooling agents. Regulation and control elements. Effects of low temperatures on raw materials and processed foods. Speed of reactions and food conservation. Ice crystalization and changes in the food structure.

Topic 3. High temperatures in food preservation. Blanching. Pasteurization and sterilization of packaged products. Continuous treatments. Equipment and processes used in industry. Action on microorganisms: DTT curves, coefficients D and Z. F0 calculation.

Topic 4. Other applications of high temperature treatments: baking, frying, toasting, baking. Dielectric heating.

Seminars

- Food industries: production systems (2h)
- Psychometrics (2h)
- Heat treatments: DTT curves (2h)

Pilot plant practices

- Pasteurization (2h)
- Chilling and freezing systems (2h)

UNIT II. Fundamentals of the industries from raw materials of animal origin

Theoretical classes

Topic 5. Technology of milk and derivatives. Composition and structure of milk. Microbiology of milk. Conservation treatments. Concentrated milk and powdered milk. Cream and butter. Coagulation. Other products.

Topic 6. Technology of meat and derivatives. Transformation of muscle in meat: normal and abnormal post-mortem metabolism in channels. Variability of meat. Cooling and freezing. Microbiology and meat conservation. Main families of emerging and processed derivatives.

Topic 7. Technology of fishery products. Composition and characteristics. Changes postmortem. Cooling and freezing. Fish processing.

Seminars

- Eggs and eggproducts (2h)
- Videos: Fish industry processing (2h)
- Videos: Meat industry processing (2h)
- Description of meat products (2h)

Pilot plant practices

- Cheese making (3h)

Laboratory practices

- Milk coagulation. Obtaining milk products (2h)
- Packaging: Quality control (2h)

Methodology

The methodology used in this course during the learning process combines the following activities:

- Classroom magisterial classes where the student acquires the basic concepts of the subject.

- Laboratory practices: complete and reinforce the knowledge acquired in the master classes. They allow the acquisition of work skills in the laboratory and the experimental understanding of concepts. At the start of the course the student will have a script available with all the practices that will be done in the laboratory. The student must make a comprehensive reading of the script of each practice. Each practice will include: objective / s, foundation, methodology and a section for the results that are obtained, as well as the file to prepare the report of each session.

- Pilot Plant practice: complete and reinforce the knowledge acquired in the master classes and allow the acquisition of pilot work skills. The student must make a comprehensive reading of the script of each practice.

- Seminars: they complete and reinforce the knowledge acquired in the master classes and allow the acquisition of skills in process modeling and interpretation of conceptual tables.

The practical sessions are of compulsory attendance and the lack of assistance must be justified

Self-learning: in group or individual, preparation and presentation of the proposed cases. This work involves the search and selection of information in various sources of information and the answer to the questions raised

The teaching material used in the subject will be available in Moodle. Self-assessment material will also be left for the different blocks of the subject, which the student can use to reinforce their knowledge. It will be used as a mechanism for the exchange of information and documents between professors and students.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practicals at the Pilot Plant	7	0.28	1, 5, 3, 6
Practicals at the lab	4	0.16	3, 6
Seminars	14	0.56	4, 3, 6
Theory class	27	1.08	1, 2, 5, 3
Type: Autonomous			
Case resolution, problems,	38	1.52	1, 2, 4, 5, 3, 6
Self study	58	2.32	2, 4, 3

Assessment

Continuous evaluation

The subject will be approved with a minimum global score of 5/10. The evaluation will be individual and will be carried out continuously during the different training activities that are taught. The subject is organized in two Units (I and II) that have an identical weight in the final grade. The minimum grade of each Unit to do average is 5/10.

In each Unit, the note will be the sum of the notes of each type of activity in the following way,

1.- 70% with the exam, which includes all the information given (lectures, seminars and practices). The exam has 2 parts: a) multiple choice questions (50% of the grade) and b) short answer questions (50% of the grade). The short answer questions will not be corrected if 4/10 is not reached in the multiple choice questions.

2.- Self-learning activities: corresponds to 20% in Unit I and 10% in Unit II, with a minimum of the block, to average 5/10, to be added to the test score

3.- Internship activities account for 10% (Unit I) or 20% (Unit II), if the criteria for each activity are met. In the practices * you must do a pre-test and assistance. For the seminars, a subsequent test should be done. Minimum to do average: 5/10.

* To be able to access the practical classes the student must perform a pre-test. The mark of these tests is the one that configures the 10 or 18% of the final grade of each Unit, whenever the student attends to him with advantage of the practice.

Recovery

Students who have not passed one or both Units during the course will be eligible for recovery, which will consist of a specific oral examination for each unit to be recovered. In the recovery exam it will include all the subject taught, questions will be asked about all the contents that have been worked on in each Unit (face-to-face and self-learning activities).

It will be necessary to obtain a minimum of 5 in the exam of recovery corresponding to each Unit to be able to make media with the other Unit to pass the subject. The notes obtained in the practices or self-learning part during the continuous evaluation will not be taken into account. For the final grade the weight of each Unit is maintained (50% U I and 50% U II) as well as the continuous evaluation.

Students who wish may present themselves to upload the note.

It is considered that the student who performs less than 60% of the evaluation activities waives the continuous evaluation.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exams	70%	2	0.08	1, 2, 5, 3
Practicals aims achievement	15	0	0	1, 6
Self learning	15%	0	0	1, 2, 4, 5, 3, 6

Bibliography

Books from the Vet's Library

- Brennan J.G., J.R. Butters, N.D. Cowell i A.E.V. Lilley (1990) Food engineering operations. Ed. Elsevier Applied Science, Barking. Las operaciones en la ingeniería de alimentos. Ed. Acribia, 1998.
- Cheftel J.C. y H. Cheftel (1980) Introducción a la bioquímica y tecnología de los alimentos. Vol. 1. Ed. Acribia, Saragossa.
- Cheftel J.C., H. Cheftel i P. Besançon (1982) Introducción a la bioquímica y tecnología de los alimentos. Vol. 2. Ed. Acribia, Saragossa.
- Fellows P. (2007) Food processing technology. Woodhead Publising, Cambridge.- Tecnología del procesado de alimentos. Ed. Acribia (1993).
- Lawrie R. (1998) Meat Science. Ed. Woodhead Publishing, Cambridge. (Existeix la traducció castellana -Ed. Acribia, 1977- d'una edició anterior).

- Mafart P. (1993) Ingeniería industrial alimentaria. Vol. 1: Procesos físicos de conservación. Ed. Acribia, Saragossa.
- Mafart P. i Béliard E. (1994) Ingeniería industrial alimentaria. Vol. 2: Técnicas de separación. Ed. Acribia, Saragossa.
- Ordoñez J. A. (ed.) (1999) Tecnología de los alimentos. Vol I. Componentes de los alimentos y procesos. Ed. Síntesis, Madrid.
- Ordoñez J. A. (ed.) (1999) Tecnología de los alimentos. Vol II. Alimentos de origen animal. Ed. Síntesis, Madrid.
- Regenstein J.M. y C.E. Regenstein (1991) Introduction to fish technology. Ed. Van Nostrand Reinhold, Nova York, Nova York.
- Richardson, T. i J.W. Finley (eds.) (1985) Chemical changes in food during processing. Ed. AVI Publishing Company, Westport, Connecticut.
- Stadelman W.J. i O.J. Cotterill (1986) Eggscience and technology. Ed. AVI Publishing Company, Westport, Connecticut.
- Thapon J.-L. i C.-M. Bourgeois (1995) L'oeuf et les ovoproduits. Ed, Tech & Doc, París.
- Walstra, P., Geurts, T.J., Noomen, A., Jellema, A (2001). Ciencia de la leche y tecnología de los productos lácteos. Editorial Acribia S.A. Zaragoza.

online books. For each topic, the teacher will indicate the most interesting.

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