Universitat Autònoma de Barcelona

2021/2022

Food Sciences

Code: 102611
ECTS Credits: 3

Degree	Type	Year	Semester
2502445 Veterinary Medicine	OB	2	1

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

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

Teachers

Victoria Ferragut Pérez
Montserrat Mor-Mur Francesch
Josep Yuste Puigvert

Prerequisites

There are no official prerequisites, but it is recommended that the students have passed the subjects of Microbiology and Biochemistry of the first year of the Degree. Students must be able to read and understand academic texts in Catalan and Spanish.

Objectives and Contextualisation

Our health depends on what we eat daily and how we do it. Also, our economy depends on that, since the agri-food sector is one of the most active in our country. In Catalonia, there are many industries that are dedicated to the production or the processing of raw materials to convert them into food. Industries must ensure that food is safe and healthy, and that it remains appetizing for as long as possible. The administration, for its part, must carry out official controls to ensure that food legislation is accomplished. According to Order ECI/333/2008 of 13 February, which establishes the requirements for the verification of the official university degree that qualifies for the exercise of the Veterinary profession, the first competence that Veterinary graduates must have acquired is the control of the hygiene, the inspection and the technology of the production and elaboration of foods of human consumption from the primary production until the consumer. Food Science and Technology related subjects which are taught in the 2nd year of the Veterinary Degree, contribute to a part of the specific competences necessary for the exercise of the profession. In the first semester, in the subject Food Science, the students must acquire the theoretical and practical fundamentals about the characteristics, composition and alteration of foods of human consumption. In the second semester, Food Technology is studied, in which the foundations and principles of the technologies used for obtaining healthy and safe foods are acquired.

After completing the course, the students are expected to:

- Recognize the components and ingredients of foods, and their functions and properties

- Recognize the additives and their main functions

- Analyze components and their properties in specific foods

- Identify specific food quality indicators

- Relate components, properties and quality indicators

- Identify the mechanisms of food deterioration

- Evaluate the possibility and probability of deterioration of a food due to a specific cause

Competences

- Analyse, synthesise and resolve problems and make decisions.
- 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, synthesise and resolve problems and make decisions.
2. Identify foodstuffs and relate their functions, characteristics, interactions and evolution.
3. Seek and manage information related with professional activity
4. Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

Content

The following contents are distributed in theory, practice, seminars and self-learning activities*:

Theory: 11 h. Non-presential format

Lecture 1. Food water. Structure and properties State of water in food. Water activity. Sorption isotherms.

Lecture 2. Biotic modifications. RASFF Portal. Bacteria. Virus. Parasites Enzymes and toxins produced by microbial metabolism. Factors that affect the growth and survival of microorganisms in food. The theory of obstacles.

Lecture 3. Components and ingredients of food: functions and properties. Food: definition. Nutritious and non-nutritive components Additives and technological adjuvants. Functional properties Functional additives.

Lecture 4. Abiotic modifications: chemical and enzymatic reactions. Non-enzymatic browning reactions. Oxidative reactions Antioxidants Reactions of the pigments. Degradation of protein and non-protein nitrogenous components. Lipolysis Enzymatic oxidation of lipids. Enzymatic degradation of carbohydrates. Enzymatic browning reactions.

Seminars: 4 h

Fermented foods. Non-presential format

Presentation of self-learning work. Presential format

Practices: 11 h

Laboratory:

Food rheology. Non-presential format

Enzymatic browning and blanching. Presential and non-presential format

Glazing and oxidation of fishery products. Presential and non-presential format

Stability of food. Presential format

Pilot plant practices:

General knowledge of the pilot plant. Presential format

Preparation of a liquefied food. Non-presential format

*Unless the requirements enforced by the health authorities demand a prioritization or reduction of these contents.

Methodology

The methodology used in this subject combines the following presential and non-presential activities*:

- Theory lectures in non-presential format to present the basic concepts of the subject.
- Individual self-learning exercise. The students must solve a brief self-learning exercise that will be announced and delivered via Moodle.
- Seminar in non-presential format that will be announced and delivered via Moodle.
- Laboratory practices: to complete and reinforce the knowledge acquired in the lectures. Practices in presential format will allow the acquisition of work skills in the laboratory and the experimental understanding of concepts. Students will have guide notes for each practice. Students must complete a prior reading of the notes before each presential practice. During the practice, students must collect the results and prepare a report that will allow them to answer the corresponding evaluation test. Before the first session, students must have passed the Basic Laboratory Safety test, following the instructions found in the Moodle classroom of the subject.
- Pilot plant practices: to complete and reinforce the knowledge acquired in the lectures. They allow the acquisition of work skills in the pilot plant. Students must complete a prior reading of the notes before each practice. Before the first session, students must have passed the Safety Test in the Food Technology Plant.

  The results of the practice evaluation test will only be taken into account for the evaluation of the subject if the student has attended to the practice or accomplished the required activities.

- Autonomous work of the student:

  - in groups of 5 people, to prepare and present a case proposed by the teachers. This work involves the search and selection of information in various sources and the answer to the questions raised in the case, and its presentation and discussion in front of the teachers and other class groups.

  -individual, to solve the short self-learning exercise, the tasks related to non-presential activities and to study for the exam.

- Seminar to present the self-learning work in groups of 5 students.
- Programmed tutoring: scheduled informative session via Teams to clarify concepts and solve doubts that may arise during the course.

The teaching material used in the subject will be available at Campus Virtual.

*The proposed teaching methodology may experience some modifications depending on the restrictions to face-to-face activities enforced by health authorities.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory practices	8	0.32	1, 2, 4
Lectures	11	0.44	2
Pilot plant practices	3	0.12	1, 2, 4
Seminars	4	0.16	1, 3, 2, 4
Type: Supervised			
Programmed tutorial	1	0.04	1, 2
Type: Autonomous			
Autonomous study and bibliography consultation	28.25	1.13	1, 3, 2
Resolution of cases, preparation, preparation and presentation of works, exercises of self-evaluation	18	0.72	1, 3, 2, 4

Assessment

The maximum score that can be obtained is 10. The subject will be approved with a minimum overall score of 5. The evaluation will be carried out continuously during the different tasks and activities that have been scheduled.

Evaluation activities are:

- Test exam: 50% of weight in the overall score. At the end of all the training activities and on the date specified in the course schedule, the students will carry out a written test with multiple choice answers about the all the contents in the subject. Maximum score: 10 points. The minimum score needed in order to average together with the scores of the rest of evaluation activities is 5 points. In case of not passing the written exam, it can be retaken on the date in the course schedule.

- Self-learning activities, seminars and practices: 50% of weight in the overall score.

*Student's assessment may experience some modifications depending on the restrictions to face-to-face activities enforced by health authorities.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Continuous evaluation activities	50	0.75	0.03	1, 3, 2, 4
Test exam	50	1	0.04	1, 2

Bibliography

- Consult course bibliography:

  https://catalegclassic.uab.cat/search*cat/r?SEARCH=ciència_dels_aliments

- Other online books accessible from the UAB library's website:

  http://www.knovel.com/web/portal/browse/subject/60/filter/0/

  From this web, we list some that can be useful:

  Chemical Deterioration and Physical Instability of Food and Beverages

  Chilled Foods

  Encyclopedia of Food Microbiology

  Essentials of Food Sanitation

  Food Additives Data Book

  Food Spoilage Microorganisms

  Oxidation in Foods and Beverages and Antioxidant Applications, Volume 1 - Understanding Mechanisms

  Of Oxidation and Antioxidant Activity

  Oxidation in Foods and Beverages and Antioxidant Applications, Volume 2 - Management in Different Industry Sectors

  Principles of Food Chemistry

  Stability and Shelf-Life of Food

Software

Not necessary any special software.