

Academic Year/course: 2022/23

30836 - Enrichment in the Milk and Egg Product Sector

Syllabus Information

Academic Year: 2022/23

Subject: 30836 - Enrichment in the Milk and Egg Product Sector

Faculty / School: 105 - Facultad de Veterinaria

Degree: 568 - Degree in Food Science and Technology

ECTS: 5.0

Year: 4

Semester: Second semester

Subject Type: Optional

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process designed for this subject consists of 20 hours of lectures, 9 hours of case studies, 14 hours of laboratory practicals, 3 hours of seminars and 4 hours of visits to industries.

Lectures will be participative and supported by means based on TICs. The students will have in the ADD all the resources necessary to prepare and follow the lecture that will be completed with additional information. The students should revise previously the contents that have been explained in the compulsory subject Technology of Dairy products and egg products given in the first semester, to keep in mind all the basic aspects related with the composition and processing of dairy and egg products. The lectures of Block I will be given in 1-3 hour sessions, in which the students will be taught in all aspects related to technological advances and procedures of quality control for dairy and egg products. The classrooms have Internet access, therefore, complementary material such as videos and web pages will be used.

Some topics of the course will be given as case studies. At the beginning of each session the lecturer will propose some issues related with food safety of dairy products and egg products that the students will have to resolve. The students will have some documents available, necessary to sort the case study out and they also will have the advice of the lecturer to search on the bibliography. At the end of each session, the students will discuss the most relevant conclusions obtained after studying the documents.

The laboratory classes will be carried out at the Pilot Plant of Food Technology, located in the Veterinary Faculty and in the laboratories of the same plant. The students will have the laboratory protocol of the practice available in the ADD, previously to the practical class and will be commented at the beginning to revise the basis of the method and check that all the material is ready.

The topics for the practical works will be supervised by the lecturers that will propose some scientific publications on diverse dairy and egg products consisting of an innovation on the traditional processes. The students will select one of the publications to make the work in groups of two or three, following a guide. The work will be supervised by one of the lecturers, will be done in PowerPoint format and will be presented in front of all the students. After the presentation the students and lectures will be able to ask some questions on the work.

The visits to industries will allow the students to know the real industrial processes of dairy and egg products. They will be encouraged to participate actively to get more profit of the visit, making questions to the technical personnel, on the basis of the knowledge acquired in the course. The visits to industries will be programmed to be done after the classes and other activities related with the production of the industry.

Students must follow the regulations described in:

- Prevention: A guide for students at the University of Zaragoza:
https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/guia_preventiva_para_estudiantes.pdf
- Manual de seguridad en los laboratorios de la Universidad de Zaragoza y normas marcadas por la Unidad de Prevención de Riesgos Laborales:

https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/manual_de_seguridad_en_los_laboratorios_de_la
<https://uprl.unizar.es/inicio/manual-de-procedimientos>

In addition, students will follow as well any instructions related to biosecurity given by the professor

4.2. Learning tasks

The learning activities of this subject are different in each of the blocks. To achieve the objectives of Block I, activities of lecture type will be used, with them the students will acquire the knowledge to be able to carry out the other learning activities of the subject. These lectures will provide knowledge that will complete the contents of the compulsory subject Technology of dairy and egg products, in those aspects related to the advanced, technological analytical methods of quality control.

The theory of Block I will be completed with the learning activities included in the laboratory practicals in which the elaboration of diverse dairy products will be carried out. The theory of Block I will be completed with the learning activities included in the laboratory practicals in which several dairy products will be elaborated. Thus, the students will be able to know the technological parameters of the different processes, evaluating the result by analyzing the final products.

The practical work pretends to integrate the knowledge acquired in the subject by interpreting the results of a scientific publication in which a new daily of egg product has been developed and is subjected to analysis of composition, texture, sensorial characteristics, etc, to evaluate their quality and compare their characteristics with those of a conventional similar product. The students must present the results of the study as if they would have developed the product and they presented it in front of the managing board of the company to convince them of the benefits to commercialize the product.

In Block II, learning activities which are activities for the evaluation as well, are carried out. They consist, in the resolution of several practical cases raised on:

- Microbiological criteria and maximum levels of chemical contaminants set in milk and dairy products in third countries. This will allow to the students to know the hygienic requirements that must be met by these products to be exported, in relation to those established in the European Union.
- Risk evaluation of chemical and microbiological hazards of current interest in milk and dairy products, egg and egg products as they are analyzed in different documents and scientific papers. To carry out these case studies, students will need to put in place knowledge and skills previously acquired with the compulsory subjects of the Grade on Food Science and Technology.

Activities of lecture type will be used in Block III to achieve environmental knowledge: pollution treatment and waste management.

In Block IV, a learning activity is carried out, which consists of an individual practical exercise comprising some questions and the critical review of different texts related to the same topics developed within the lecture session.

4.3. Syllabus

The course will address the following topics:

LECTURES

BLOCK I: Technological advances, food security, regulations and quality control of dairy and egg products (14 h)

- Lesson 1: Technological advances and quality of liquid, concentrated and powdered milks (3 h). Technological advances in liquid, concentrated and powdered milks. Quality regulations. Quality standards. Quality control and analytical methods for liquid, concentrated and powdered milks.
- Lesson 2: Technological advances and quality of fermented milks (2 h). Technological advances in fermented milks. Quality regulations. Quality standards. Quality control and analytical methods for fermented milks.
- Lesson 3: Technological advances and quality of cream, butter and ice-creams (3 h). Technological advances in cream, butter and ice-creams. Quality regulations. Quality standards. Quality control and analytical methods for cream, butter and ice-creams.
- Lesson 4: Technological advances and quality of fresh, mature and processed cheeses (4 h). Technological advances in fresh, mature and processed cheeses. Quality regulations. Quality standards. Quality control and analytical methods of fresh, mature and processed cheeses.
- Lesson 5: Technological advances and quality of eggs, egg products and milk and egg desserts (2 h). Technological advances in the elaboration of ovoproducts. Quality regulations. Quality standards. Quality control and analytical methods of eggs, ovoproducts and milk and egg desserts

BLOCK II. Food safety and legal regulations for dairy and egg products (9 h)

- Lesson 6. Hygiene requirements for the export of egg and dairy products (2 h).

Interpretation of microbiological criteria and maximum levels of chemical contaminants set by the current legal normative. Evaluation and comparison with the requirements established by other countries for the export of dairy and egg products. Case study: exports to third countries.

- Lesson 7. Emerging risks in the dairy and egg product sectors (5 h).

Resolution of case studies related to presently great interest problems for the dairy industry and the industry of egg products. Case study 1: Biogenic amines. Case study 2: Contaminants and residues.

- Lesson 8. Strategies to sustainably balance and optimize the health of people, animals and ecosystems applied to the dairy and egg products sector. (2 h)

Application of programs, policies, laws and research in which multiple sectors communicate and collaborate to achieve better public health results, integrating animal and environmental health, focusing its study on the dairy and egg products sectors. Case study: One Health.

BLOCK III: Environmental aspects of the dairy and egg products (2,5 h)

- Lesson 9: Types of pollutants and waste management in the dairy and egg products. Origin and types of pollutants. Polluting processes. Characterization of contamination. Pollution treatment. Waste management. Best techniques available. Practical cases.

BLOCK IV: Dairy and egg products sector: structure, marketing chain, consumption and cultural aspects (3,5 h).

- Lesson 10: Structural market aspects and the marketing chain of dairy products at national and international level (2,5 h). Production, consumption and foreign trade. Marketing chain and prices. Domestic and foreign distribution channels of dairy products
- Lesson 11: Market and egg products marketing at national level (1 h). Production at national level. Consumption and demand of egg products. Foreign trade. Marketing chain.

LABORATORY PRACTICALS

- **Laboratory practical 1.** Elaboration of set and stirred yoghurt. Quality control of raw material and final product. 4 h (two sessions of 2 h).
- **Laboratory practical 2.** Quality control of butter stored in different conditions by texture measurement and sensory analysis. 2 h.
- **Laboratory practical 3.** Elaboration of fresh cheese from cow and goat milk. Quality control of raw material and final product. 5 h (in two sessions of 2 h).
- **Laboratory practical 4.** Sensory analysis of several varieties of cow, ewe and goat cheeses. 1 h.
- **Laboratory practical 5.** Elaboration of ice-cream. Quality control by texture and sensory analysis. 2 h.

SEMINARS

The students will present the practical work in the classroom in front of the other students and lecturers using PowerPoint presentation. 3 h.

VISITS TO INDUSTRIES

- Visit to the Cheese Industry Villacorona (El Burgo de Ebro, Zaragoza). 2 h.
- Visit to the Dairy Industry Saiona (Olvega, Soria). 2 h.

The visits will be made if the health situation allows it and in the event that they cannot be carried out, they will be replaced by some activities related to these industries, as the viewing of related videos.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Faculty of Veterinary website <http://veterinaria.unizar.es/>. Visits during office hours will be agreed previously with the teachers.

4.5. Bibliography and recommended resources

The bibliography and recommended sources are updated and can be consulted in the web of the library (search recommended bibliography in biblioteca.unizar.es).