

26238 - Enrichment in the Milk and Egg Product Sector

Información del Plan Docente

Academic Year	2016/17
Academic center	105 - Facultad de Veterinaria
Degree	294 - Degree in Food Science and Technology
ECTS	6.0
Course	4
Period	Second semester
Subject Type	Optional
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The learning process designed for this subject consists of 24 hours of lectures, 11 hours of case studies, 17 hours of laboratory practicals, 3 hours of seminars and 5 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

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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.

5.2.Learning activities

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 advance, 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 dairy or 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.

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- 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.

5.3.Program

LECTURES

BLOCK I: Technological advances, food security, regulations and quality control of dairy and egg products (17 h)

Lesson 1: Technological advances and quality of liquid, concentrated and powdered milks (4 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 (3 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 (4 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 (11 h)

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Lesson 6. Hygiene requirements for the export of egg and dairy products.

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.

Lesson 7. Emerging risks in the dairy sector.

Resolution of case studies related to presently great interest problems for the dairy industry.

Lesson 8. Emerging risks in the sector of egg products

Resolution of case studies related to currently great interest problems for the egg products industry.

BLOCK III: Environmental aspects of the dairy and egg products (3 h)

Lesson 9: Types of pollutants and waste management in the dairy and egg products (3 h)

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 (4 hours).

Lesson 10: Structural market aspects and the marketing chain of dairy products at national and international level (3 hours).

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 hour).

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 hours.
- **Laboratory practical 2.** Quality control of butter stored in different conditions by texture measurement and sensory analysis. 3 hours.
- **Laboratory practical 3.** Elaboration of fresh cheese from cow and goat milk. Quality control of raw material and final product. 5 hours. Quality control of fresh cheeses by texture measurement and sensory analysis. 3 hours
- **Laboratory practical 4.** Elaboration of ice-cream. Quality control by texture measurement and sensory analysis. 2 hours.

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SEMINARS

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

VISITS TO INDUSTRIES

- **Visit to the Cheese Industry Villacorona** (El Burgo de Ebro, Zaragoza). 3 hours.
- **Visit to the Ice-cream Industry Lic** (Utebo, Zaragoza). 2 hours.

In the following table the workload is distributed in presential activities and in personal work of the student within the different activities programmed for this subject.

5.4.Planning and scheduling

5.5.Bibliography and recommended resources

a. Libros y artículos

Clark, S., Costello, Drake, M.A. y Bodyfelt, F. *Sensory Evaluation of Dairy Products*. Springer Science + Business Media LLC. Nueva York, NY (EEUU), 2009.

TAMIME, A.Y. *Structure of Dairy Products*. Society of Dairy Technology book series. Ed. A.Y. Tamime . Wiley-Blackwell, Oxford (Reino Unido), 2007.

TAMIME, A.Y. *Cleaning-in-Place: Dairy, Food and Beverage Operations*. Society of Dairy Technology book series. Ed. A.Y. Tamime. Blackwell Publishing. Oxford (Reino Unido), 2008.

TAMIME, A.Y. *Processed cheese and analogues*. Ed. A.Y. Tamime. Society of Dairy Technology book series. Wiley-Blackwell, Oxford (Reino Unido), 2011.

Drake, M.A. (2007). Invited review: sensory analysis of dairy foods. *Journal of Dairy Science*, 90 , 4925-4937.

Johnson, M.E. y Lucey, J.A. (2006). Major technological advances and trends in cheese. *Journal of Dairy Science*, 89 , 1174-1178.

McSweeney, P.L.H., Hayaloglu, A.A., O'Mahony, J.A. y Bansal, N. (2006). Perspectives on cheese ripening. *Australian Journal of Dairy Technology*, 61 , 69-77.

Sánchez, L. y Pérez, M.D. *Physical Properties of Dairy Products*. En: *Physical Properties of Food*. CRC Press, Taylor and Francis Group. Boca Raton, FL (EEUU), 2012. Pags. 355-398.

Van Immerseel, F., Nys, Y. y Bain, M. Improving the safety and quality of eggs and egg products: egg safety and

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nutritional quality (Volume 2). Woodhead Publishing Series in Food Science, Technology and Nutrition, No. 214. Woodhead Publishing Limited. Cambridge (Reino Unido), 2012.

Wilkinson, M.G. y Kilcawley, K.N. (2005). Mechanisms of incorporation and release of enzymes into cheese during ripening. *International Dairy Journal*, 15 , 6-9.

b. Legislación y documentos oficiales

Cabellos, P.J., Lizcano, L. y García, M. Manual de Aplicación del Sistema APPCC en Centros de Clasificación de Huevos e Industrias de Ovoproductos de Castilla-La Mancha. Junta de Comunidades de Castilla-La Mancha y CECAM, 2006.

Dairy Production and Trade Developments, United States Department of Agriculture. Issue [2] . Diciembre, 2007.

Guide to Good Manufacturing Practice for "Liquid, concentrated, frozen and dried egg products". European Egg Processors Association, 2011.

Instituto de Estudios del Huevo. Lecciones sobre el huevo. 2002: <http://www.institutohuevo.com> .

Ministerio de Medio Ambiente. Gobierno de España. Prevención en la contaminación en la industria láctea Centro de Actividad Regional para la Producción Limpia (CAR/PL). Plan de Acción para el Mediterráneo: <http://www.cema-sa.org> .

Ministerio de Medio Ambiente. Gobierno de España. Guía de Mejores Técnicas Disponibles en España del Sector Lácteo. <http://www.prtr-es.es/>

Instituto de Estudios del Huevo-Ministerio de Agricultura Pesca y Alimentación-Inprovo. Seguridad Alimentaria en Huevos y Ovoproductos. Ed. Instituto de Estudios del Huevo, Madrid (España), 2006.

Reglamento 1234/2007 del Consejo que crea una organización común de mercados agrícolas y establece disposiciones específicas para determinados productos agrícolas.

Real Decreto 226/2008, de 15 de febrero, por el que se regulan las condiciones de aplicación de la normativa comunitaria de comercialización de huevos.

Reglamento (CE) N° 589/2008 de la Comisión de 23 de junio de 2008 por el que se establecen las disposiciones de aplicación del Reglamento (CE) N° 1234/2007 del Consejo en lo que atañe a las normas de comercialización de los huevos.

Reglamento (CE) N° 598/2008 de la Comisión de 24 de junio de 2008 que modifica el Reglamento (CE) N° 589/2008 por el que se establecen las disposiciones de aplicación del Reglamento (CE) N° 1234/2007 del Consejo en lo que atañe a las normas de comercialización de los huevos.

Zanneti, R., Victoria, F., Hernando, N., Pérez, R., Sanz, L., Saura, B., Paz, J., Martínez, S., García, J., Jiménez, F., González, J. y Fernández, M. Guía de Buenas Prácticas de Higiene para la elaboración de ovoproductos. Ministerio de Medio Ambiente y Medio Rural y Marino, INOVO. Madrid, (España), 2009.

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c. Direcciones de Internet

AESAN. Agencia Española de Seguridad alimentaria y Nutrición: <http://www.aesan.msc.es>

American Egg Board: <http://www.aeb.org>, <http://www.functionalegg.org>

Asociación española de productores de huevos: <http://www.aseprhu.es>

Asociación Española para la Calidad: [http:// www.aec.es](http://www.aec.es)

British Eggs Information Service: <http://www.britegg.co.uk>

Egg Nutrition Center: <http://www.eggnutritioncenter.org/blog/>

Entidad Nacional de Acreditación: [http:// www.enac.es](http://www.enac.es)

European Accreditation: www.european-accreditation.org

European Dairy Association: <http://www.eda.euromilk.org>

European Egg Processors Association: <http://www.eepa.info>

FDA. Food Safety: <http://www.fda.gov/food/foodsafety>

Infocalidad: [http:// www.infocalidad.com](http://www.infocalidad.com)

Inprovo. Organización interprofesional del huevo y sus productos: <http://www.inprovo.es>

Inovo. Asociación española de industrias de ovoproductos: <http://www.inovo.es>

International Accreditation Forum INC.: [http:// www.iaf.nu](http://www.iaf.nu)

International Egg Commission: <http://www.internationalegg.com>

ISO: <http://www.iso.org>

Web del huevo: <http://www.huevo.org.es>