

# FOOD INDUSTRIES OF ANIMAL ORIGIN

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Food Tecnology	Food industries of animal origin	3º	1º	6	Optional
<b>LECTURER(S)</b>			<b>Postal address, telephone nº, e-mail address</b>		
Eduardo Jesús Guerra Hernández Vito Verardo			Nutrition and Food Department, 3rd floor, Faculty of Pharmacy. Office No. 316 and 311. E-mail: <a href="mailto:ejguerra@ugr.es">ejguerra@ugr.es</a> and <a href="mailto:vitoverardo@ugr.es">vitoverardo@ugr.es</a>		
<b>DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT</b>					
Food Science and Technology					
<b>PREREQUISITES and/or RECOMMENDATIONS (if necessary)</b>					
The own to access to the Degree in Science and Food Technology. It is recommended to have taken the subjects of Biology, Structural Biochemistry, Physiology and Human Cellular and basic knowledge about food composition. It may be taken in 3rd or 4th year					
<b>BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE ¿??)</b>					
Classification and descriptive study of chemical composition, properties and nutritive value of animal foods: dairy, egg, meat and fish products.					
<b>GENERAL AND PARTICULAR ABILITIES</b>					
<b>General abilities:</b> CG01 to CG14, CB1 to CB5, and CT1 collected in the framework document of the degree					
<b>Particular abilities:</b>					
<ul style="list-style-type: none"> <li>• <b>CE2.</b> Know the production models of animal foods, their composition and physical, physico-</li> </ul>					



chemical and chemical properties to determine its nutritional value and functionality.

- **CE3.** Learn the techniques and food analysis to ensure optimal conditions for human consumption.
- **CE6.** Know, understand and apply the classical methodology and the new technological processes to improve the production and processing of food.
- **CE15.** Inform, educate and advise legal, scientifically and technically to the public administration, the food industry and consumers to design intervention strategies and training in the field of science and food technology.

#### **OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)**

- Assess the present development of the Spain and EU dairy sector in terms of production, consumption, legislation, and socio-economic importance
- Know the chemical composition and elaboration of derivatives of milk, egg, meat and fish with special attention to new products
- Know the common analytical techniques in elaboration quality control
- Study of new technologies of dairy products with special reference to use of subproducts

#### **DETAILED SUBJECT SYLLABUS**

#### **THEORETICAL CONTENT**

##### **MODULE 1. Meat products**

**Item 1.** Transportation of animals before slaughter. Sacrifice of animals. Marketing and technological aspects. Possible uses of processed slaughter byproducts (1 hour).

**Item 2.** Properties of myo-meat systems. Post-mortem metabolism. Structure of skeletal muscle tissue. Post-mortem changes of muscle and abnormal processes. PSE and DFD meat. (1 hour).

**Item 3.** Sensory properties of meat. Juiciness. Color. Texture and hardness. Smell and Taste (2 hours).

**Item 4.** Meat conservation by cold application. Refrigeration and freezing. Methods Used: advantages and disadvantages. Packaging sustainable in the meat industry (2 hours).

**Item 5.** Meat products. Definition. Classification. Functional properties of proteins. Raw meat products, raw pickled meat products and cured meat products. General process of manufacture. Raw material selection. Ingredients. Formulation. Dough preparation. Equipments used in the meat Industry. Alterations and defects in raw-cured products. (3,5 hours).



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**Item 6.** Meat products (continuation). Heat-treated meat products. Meat products in salt. Prepared meat dishes. Other meat products. (2,5 hours).

**Item 7.** Innovations in the meat industry and possible substitutes (1h).

#### **MODULE 2.- Fish products**

**Item 8.** Fish and derivatives. Fish: Classification of consumer species. Chemical composition and nutritive value. Seafood and shellfish of consumption. Chemical composition. Fish alterations. Analytical and health criteria. Products dried, salted, smoked and pickled. Manufacture (3 hours).

**Item 9.** Fish and derivatives (continuation). Canned fish. The roe. Concentrates of fish. Textured protein concentrates. Gelled products. Surimi. Definition. Classification. Manufacture (2 hours).

#### **MODULE 3. Egg products and bee products**

**Item 10.** Egg products. Definition. Classification. Manufacture and storage. Functional and technological properties. Interest and application in food industry (2 hours)..

**Item 11.** Bee products. Classification. Manufacture and storage of honey, pollen, royal jelly and propolis (1 hour).

#### **MODULE 4. Dairy products**

**Item 12.** Historical overview of the main dairy products. Importance and current of the dairy sector. Production, consumption and future prospects (2 hours)

**Item 13.-**Treatment and transformation of milk. Technology of dairy products. Thermic treatments. Centrifugation. Normalization of fat content. Bactofugation. Filtration. Evaporation. Other treatments (3 hours)

**Item 14.** Fermented milks. Definition and classification. Yogurt. Kefir. Koumis. New generation of fermented milks. Technological process of elaboration. Enzymes. Ingredients with functional properties. Quality control . (4 hours)

**Item 15.-** Cream and Butter. Definition. Chemical composition. Tecnological process of elaboration of cream and butter. New products. Interest in food science. Control of alterations. (1 hours)

**Item 16.** Ice cream. Definition and classification. Ingredientes. Elaboration techniques. Chemical composition. Microbiological and sensory control. (1 hours)

**Item 17.-** Cheese. History. Their Importance in Mediterranean diet. General process of elaboration. Enzymes. Maturation: microbiological and biochemical aspects. Quality control. Legislation. Cheese types more representative. Chemical composition and nutritive value. . (3 hours) .

**Item 18.** Other dairy products. Curd. Cottage cheese. Smoothies and Dairy desserts. Chemical



composition. Technological process of manufacture. Quality control. (3 hours)

**Item 19.** By-products of the dairy industry. Caseinates. Whey. Whey proteins. Their obtention. Importance in the food industry. Investigation, Research, development and technological innovation . (3 hours).

### **PRACTICAL CONTENT**

#### **SEMINARIES**

- Elaboration of specific products of animal origin characteristic of particular countries or with improved nutritional properties
- Market study of new food of animal origin

#### **LABORATORY**

- Practice 1. Production of fermented dairy products.
- Practice 2. Determination of sodium chloride in cheese.
- Practice 3. Determination of Trimethylamine Nitrogen (N-TMA) in fish
- Practice 4. Effect of the formulation on the loss of water during the cooking of meat products
- Practice 5. Qualitative determination of starch in meat derivatives
- Practice 6. Sensory and colorimetric analysis of honey

#### **PRACTICAL IN OUTSIDE**

- **Visit to some dairy, meat and fish industries.**

#### **READING**

- Alais CH. Ciencia de la leche. Principios de técnica lechera. Reverté, Madrid, 1985
- Amiot J. Ciencia y tecnología de la leche: principios y aplicaciones. Acribia. Zaragoza, 1991.
- AOAC. Official Methods of analysis of the Association of Official Analytical Chemists, 17ª ed. Ed. Helrich, K.; Arlington, VA. USA. 2000
- Bartholami, A. Fábricas de alimentos. Acribia. Zaragoza. 2001.
- Belitz HD, Grosch W. Schieberle, P. Química de los alimentos. Acribia. Zaragoza, 2012.
- Ceballos, R. Manipulación de alimentos en las carnes y derivados, aves y caza. 2009



- Durand P. Tecnología de los productos de charcutería y salazones. Acribia, Zaragoza, 2002.
- Early R. Tecnología de los productos lácteos. Acribia, Zaragoza, 2000.
- Feiner, G. Manual de productos cárnicos. Ciencia práctica y tecnología. Acribia. Zaragoza, 2018
- Galanakis, C.M. Sustainable meat production and processing. Academic Press. 2019
- Gil A (Editor). Tratado de Nutrición. Tomo III: Composición y calidad nutritiva de los alimentos. Panamericana, Madrid, 2017.
- Hall, G.M. Tecnología del procesado del pescado. Ed. Acribia. Zaragoza. 2001
- Luquet FM. Leche y productos lácteos: vaca, oveja, cabra. Vol. 1: La leche, de la mama a la lechería. Vol. 2. Productos lácteos, transformación y tecnología. Acribia, Zaragoza, 1991.
- Manus M. Introducción a la tecnología quesera. Acribia. Zaragoza, 2003.
- Mazza G. Alimentos funcionales: aspectos bioquímicos y de procesado. Acribia, Zaragoza, 2000.
- Madrid Antonio. Formación profesional en industrias lácteas. AMV Ediciones. Madrid, 2017.
- Moutney GJ Parkhurst CR. Tecnología de productos avícolas. K. Acribia. Zaragoza. 2002.
- Ordoñez Sánchez, J. I. Guía de identificación de filetes y rodajas de pescado de consumo en España. Díaz de Santos. Madrid. 2012.
- Ordoñez JA (Editor). Tecnología de los alimentos. Vol. I: Componentes de alimentos y procesos. Vol. II: Alimentos de origen animal. Síntesis, Madrid, 1998.
- Ranken M.D.. Manual de industrias de la carne. AM Vicente ediciones. Madrid. 2003
- Ruiter A. El pescado y los derivados de la pesca: composición, propiedades nutritivas y estabilidad. Acribia, Zaragoza, 1999.
- Tanime AY, Robinson, RK. Yogur. ciencia y Tecnología. Acribia. Zaragoza. 1991.
- Timm F. Fabricación de helados. Acribia. Zaragoza., 1989.
- Veisseyre R. Lactología técnica. Acribia, Zaragoza, 1998.
- Walstra P, Geurts TJ, Normen A, Jellema A, Van Voekel M. Dairy technology. Marcel Dekker. New York, 1999.

#### National and international agencies-

- Agencia Española de Consumo, Seguridad Alimentaria y Nutrición - AECOSAN
- European Food Safety Authority (EFSA).
- Association of Official Analytical Chemists - AOAC
- Codex Alimentarius

#### Scientific Journals



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- *Journal of the Society of Dairy Technology*
- *Journal of Dairy Research*
- *International Dairy Journal*
- *Journal of Agricultural and Food Chemistry*
- *Food Chemistry*
- *International Journal of Food Science and Nutrition*
- *Critical Reviews in Food Science and Nutrition*

#### Legislation of food

- Boletín Oficial de la Junta de Andalucía
- Boletín Oficial del Estado
- Diario Oficial de la Unión Europea

#### RECOMMENDED INTERNET LINKS

- European Dairy Association: <http://www.eda.euromilk.org/en/main.htm>
- Control de Calidad Agroalimentaria – Principales disposiciones aplicables a la leche: <http://www.mapya.es>
- Internacional Dairy Federation: <http://www.fil-idf.org/>
- Asociación Nacional de Industriales de Leche Líquida: <http://www.fenil.org.463.html>
- Agencia Española de Seguridad Alimentaria y Nutrición: <http://www.aesan.msc.es>
- Codex Alimentarius – Normas Alimentarias FAO/OMS: <http://www.codexalimentarius.net>
- Federación Española de Industrias de la Alimentación y Bebidas: <http://www.fiab.es>
- - Confederación de Industrias Agro-Alimentarias de la Unión Europea - CIAA  
<http://www.shwebisonline.com/c/eucall/profiles/131-ciaa-confederation-of-the-food-and-drink-industries-of-the-eu.htm?Itemid=58>
- European Food Safety Authority (EFSA) .[www.efsa.europa.eu](http://www.efsa.europa.eu)

