

MODULE	SUBJECT MATTER	YEAR	SEMESTER	CREDITS	TYPE
Food Tecnology	FOOD INDUSTRIES OF ANIMAL ORIGIN	4th	1st	6.0	Optional
TEACHING STAFF ⁽¹⁾			ADDRESS, TELEPHONE NUMBER, EMAIL, ETC. DIRECCIÓN COMPLETA DE CONTACTO PARA TUTORÍAS		
<ul style="list-style-type: none"> Eduardo Jesús Guerra Hernández Vito Verardo 			Nutrition and Food Department, 3rd floor, Faculty of Pharmacy. Office No. 316 and 711. E-mail: ejguerra@ugr.es and vitoverardo@ugr.es		
			TIMETABLE FOR TUTORIALS OR LINK TO WEBSITE		
			Tuesday and Thursday de 11.30- 14:30 (1st semester) and 8:30 - 11:30 (2nd semester) (Prof. Guerra Hernández). Monday, Tuesday and Thursday 10.30-12.30 (1st semester) and Monday, Wednesday and Friday 11.30-13.30 (2nd semester) (Prof. Vito Verardo)		
BELONGS TO UNDERGRADUATE DEGREE PROGRAMME			AND ALSO TO OTHER UNDERGRADUATE DEGREE PROGRAMMES		
Degree in Science and Food Technology					
PREREQUISITES OR RECOMMENDATIONS (where applicable)					
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.					

¹ Consult any updates in Acceso Identificado > Aplicaciones > Ordenación Docente

(∞) This course guide should be filled in according to UGR regulations on assessment of student learning: ([http://secretariageneral.ugr.es/pages/normativa/fichasugr/ngc7121/!](http://secretariageneral.ugr.es/pages/normativa/fichasugr/ngc7121/))



BRIEF DESCRIPTION OF CONTENT (ACCORDING TO OFFICIAL VALIDATION REPORT)

Classification and descriptive study of chemical composition, properties and nutritive value of animal foods: dairy, egg, meat and fish products.

GENERAL AND SPECIFIC COMPETENCES

General abilities:

CG01 to CG14, CB1 to CB5, and CT1 collected in the framework document of the degree

Particular abilities:

- CE2. Know the production models of animal foods, their composition and physical, physico-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 AS EXPECTED LEARNING OUTCOMES)

- 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 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. Sensory properties of meat. Juiciness. Color. Texture and hardness. Smell and Taste (2 hours).
- Item 3. Meat conservation by cold application. Refrigeration and freezing. Methods Used: advantages and disadvantages. Packaging sustainable in the meat industry (2 hours).
- Item 4. 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).



- Item 5. Meat products (continuation). Heat-treated meat products. Meat products in salt. Prepared meat dishes. Other meat products. (2,5 hours).
- Item 6. Innovations in the meat industry and possible substitutes (1h).

MODULE 2.- Fish products

- Item 7. 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 8. 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 9. Egg products. Definition. Classification. Manufacture and storage. Functional and technological properties. Interest and application in food industry (2 hours).
- Item 10. Bee products. Classification. Manufacture and storage of honey, pollen, royal jelly and propolis (1 hour).

MODULE 4. Dairy products

- Item 11. Treatment and transformation of milk. Technology of dairy products. Thermic treatments. Centrifugation. Normalization of fat content. Bactofugation. Filtration. Evaporation. Other treatments (3 hours)
- Item 12. 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 13.- 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 14.- 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 15. Other dairy products. Curd. Cottage cheese. Smoothies and Dairy desserts. Chemical composition. Technological process of manufacture. Quality control. (3 hours)
- Item 16. 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).
- Item 17. Ice cream. Definition and classification. Ingredientes. Elaboration techniques. Chemical composition. Microbiological and sensory control. (1 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.

BIBLIOGRAPHY

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- AOAC. Official Methods of analysis of the Association of Official Analytical Chemists, 17^a ed. Ed. Helrich, K.; Arlington, VA. USA. 2000
- Bartholami, A. Fábricas de alimentos. Acribia. Zaragoza. 2001.
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- Ceballos, R. Manipulación de alimentos en las carnes y derivados, aves y caza. 2009
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- 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.
- Manaus 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.
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- 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.
- Varnam, A.M and Sutherland, J.A. Carne y productos cárnicos, Acribia. Zaragoza. 1998
- 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.

- **Other literature:**
- Organismos Nacionales e Internacionales
- Agencia Española de Consumo, Seguridad Alimentaria y Nutrición - AECOSAN
- European Food Safety Authority (EFSA).
- Association of Official Analytical Chemists - AOAC
- Codex Alimentarius

- **Scientific journals**
- Journal or 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

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

RECOMMENDED 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 Consumo, Seguridad Alimentaria y Nutrición: <http://www.aecosasan.msssi.gob.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.shwebizonline.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

TEACHING METHODOLOGY



- Master class
- Oral presentation of specific items assigned to the student
- Practical classes in the laboratory.
- Field practices

