



Universitat de Lleida

DEGREE CURRICULUM

ANIMAL FOOD PROCESSING TECHNOLOGY

Coordination: GINER SEGUÍ, JOAQUÍN JESÚS

Academic year 2021-22

Subject's general information

Subject name	ANIMAL FOOD PROCESSING TECHNOLOGY			
Code	102588			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Food Science and Technology	3	COMPULSORY	Attendance-based
	Bachelor's Degree in Agricultural and Food Engineering	3	COMPULSORY	Attendance-based
	Master's Degree in Management and Innovation in the Food Industry		COMPLEMENTARY TRAINING	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	1.6	1.4	3
	Number of groups	2	2	2
Coordination	GINER SEGUÍ, JOAQUÍN JESÚS			
Department	FOOD TECHNOLOGY			
Teaching load distribution between lectures and independent student work	Attendance-based time: 60 h Non attendance-based time: 90 h			
Important information on data processing	Consult this link for more information.			
Language	DEGREE IN FOOD SCIENCE AND TECHNOLOGY Spanish: 100%			
	DEGREE IN AGRICULTURAL AND FOOD ENGINEERING Catalanish: 50% Spanish: 50%			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GINER SEGUÍ, JOAQUÍN JESÚS	joaquin.giner@udl.cat	3	
IBARZ MARTÍNEZ, RAQUEL	raquel.ibarz@udl.cat	3	
ROMERO BARRIO, JOSE JAVIER	josejavier.romero@udl.cat	6	

Subject's extra information

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

This subject is part of a block of Food Technology subjects that are taken during the third year of the undergraduate studies. This block of subjects is oriented to the study of food manufacturing processes applying the knowledge acquired in cross-cutting subjects, specifically, in the subjects of Foundations of Food Engineering and Processes in the Food Industry. In this specific subject, the transformation processes of meat and meat products are studied.

These processes range from slaughter technologies for obtaining fresh meat to specific technologies as well as the production of cured and cooked meat products. The knowledge that is taught in this subject is oriented so that the student, analyzing unit operations and auxiliary systems, learns to define, design and dimension the complete manufacturing processes of the different meat products.

Recommendations

It is recommended to have passed, or at least have completed the following subjects: Physics and Chemistry of Food I and II, Microbiology and Parasitology of Food, Production of Raw Materials of Animal Origin, Foundations of Food Engineering and Processes of the Food Industry.

Note

The scheduled hours and activities, as well as the evaluation methodology and procedure, may be modified for extraordinary reasons.

DEGREE IN AGRICULTURAL AND FOOD ENGINEERINGa

Academic framework of this subject

The subject "Animal Food Processing Technology" is included in the set of food Industries. The skills of this subject will come in useful to student for to defining completely the processes to manufacture foods related to meat industries and to dairy industries. The study will involve: a) sections of the industries and their functioning, b)

regulatory aspects, c) characteristics and composition of raw materials, d) flow chart and operations involved in their manufacture processes, e) characteristics of intermediate and final products, f) control parameters and quality control of the processes and products g) management and exploitation of by-products.

Note

The scheduled hours and activities, as well as the evaluation methodology and procedure may be modified for extraordinary reasons.

Learning objectives

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

The student, when passing the subject, must be able to:

- Schedule and plan the processes of making meat and meat products.
- Select the most suitable equipment and facilities for meat product processing lines.
- Resolve incidents and make decisions that may be decisive to ensure the correct processing of meat and meat products.
- Demonstrate knowledge about the market and consumption trends of meat and meat products.
- Plan and develop new products and processes.

DEGREE IN AGRICULTURAL AND FOOD ENGINEERING

It is intended that the student be able, in the field of the food industries studied in this field, to:

- Describe the processes of obtaining and transforming meats, meat products, milk and dairy products.
- To handle and know how to apply the various current provisions that are applicable.
- Outline, in flow diagrams, the manufacturing processes of these industries.
- Identify raw materials, ingredients, additives and other materials used in the meat and dairy industries.
- Assess the influence of the composition and properties of raw materials on the quality of final products.
- Interpret the physical and chemical changes that occur within the various processes of preparation and transformation.
- Modify the manufacturing processes of meat and dairy products.
- Organize the production of production lines.
- Associate composition and defects in the final product with the raw materials and applied technology.
- Select equipment for manufacturing lines.
- Dimension production lines and estimate the capabilities of their main and auxiliary equipment.

Competences

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

◦ Specific

CE1. Select and apply the physical and mathematical foundations necessary for the development of other disciplines and the activities of the profession.

CE2. Identify and apply the chemical foundations necessary for the development of other disciplines and the activities of the profession.

CE4. Select and apply the basic concepts of the statistical method, being able to statistically analyze the results of studies and interpret them critically.

CE5. Apply the basic processes of a laboratory and use equipment, handle reagents, meet safety conditions and prepare reports.

CE6. Posing and solving problems by correctly applying the concepts acquired to specific situations.

CE19. Analyze the technological aspects of animal production that determine the quality of raw materials for subsequent transformation.

CE21. Discuss the rationale and apply basic operations to food manufacturing processes.

CE22. Recognize food processing equipment and know how to use it.

CE23. Outline, based on flow diagrams, the processes of food preparation and preservation.

CE24. Identify and evaluate raw materials, ingredients, additives and technological aids for use in the agri-food industry.

CE25. Explain the role of ingredients and food additives.

CE26. Apply basic knowledge about raw materials, ingredients and additives to food formulation.

CE27. Interpret the physical and chemical changes that occur during the different food-making processes.

CE28. Modify the processes of making a food based on some objectives.

CE29. Select equipment and organize food preparation and packaging lines.

CE30. Develop new processes and products.

CE31. Identify and assess the various parts of a project of an agri-food industry.

CE32. Sizing production lines.

CE33. Estimate equipment capabilities for production lines and auxiliary systems needs.

◦ Basic

CB1. That students have demonstrated to possess and understand knowledge from the base of general secondary education at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study

CB2. That students know how to apply their knowledge to their work or vocation in a professional way and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

CB3. That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant issues of a social, scientific or ethical nature.

CB4. That students can transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.

CB5. That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

- **General**

CG1. Analyze specific situations, define problems, make decisions and implement action plans in search of solutions.

CG2. Interpret studies, reports, data and analyze them numerically.

CG3. Select and manage the available written and computerized sources of information related to the professional activity.

CG4. Work alone and in a multidisciplinary team.

CG5. Understand and express themselves with the appropriate terminology.

CG6. Discuss and argue in various forums.

CG7. Recycle in new technological advances through continuous learning.

CG8. Value comprehensive training, personal motivation and mobility.

CG9. Analyze and assess the social and ethical implications of professional activity.

CG10. Have a critical and innovative spirit.

CG11. Analyze and assess the environmental implications in professional activity.

- **Transversal**

CT1. Correctly present information orally and in writing.

CT3. Use existing IT and communication tools as support for the development of their professional activity.

CT3. Respect the fundamental rights of equality between men and women, the promotion of Human Rights and the values of a culture of peace and democratic values.

DEGREE IN AGRICULTURAL AND FOOD ENGINEERING

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Subject contents

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

CHAPTER I - INTRODUCTION

Subject 1.- The Meat Sector . Structure of the Meat Sector. Economic importance. Current situation of the meat industry in Spain. The Meat Sector in the face of the European Single Market. Sectoral perspectives. National and international exhibitions.

Subject 2.- Basic Legislation of the sector. Technical-Sanitary Regulations. Quality standards for meat products.

CHAPTER II - MEAT OBTAINING TECHNOLOGY

Subject 3.- Technology of the sacrifice. Transport. Reception and identification. Stable and ante-mortem inspection. Basic facilities of a slaughterhouse. Pig slaughter line. Beef slaughter line. Bird slaughter line. Phases of sacrifice and facilities.

Subject 4.- Valuation and classification of the channels. Assessment: Classification systems. Instrumental classification. Classification of pork, beef and poultry. Meat quality: ante-mortem and post-mortem factors that affect meat quality.

Item 5.- Refrigeration and freezing of meat. Cooling systems. Cooling methods. Refrigerated storage of meat. Basic aspects of meat freezing processes. Freezing speed and time. Freezing storage. Thawing. Industrial thawing procedures.

Item 6.- Slaughterhouse by-products. By-product classes. Edible by-products. Bones. Mechanically recovered meat (MDM). Use of blood. Other by-products. Scandalism and valuation of channels.

CHAPTER III - MEAT PRODUCTION TECHNOLOGY

Item 7.- Classification of meat products. Fresh meat products. Cured meat products. Heat-treated meat products. Basic principles of curing. Adjuvants and ingredients.

Item 8.- Fresh meat products. Raw materials: selection criteria. Description of the production process: chopped, kneaded, stuffed / formed. Problems posed by its marketing.

Item 9.- Raw-cured sausages. Classification and Quality Standards. Raw materials: selection criteria. Additives. Initiator crops: starters. Guts: natural and artificial. Description of the production process: chopping, kneading, stuffing, drying / maturation and final conditioning. Technological alternatives: fast healing and slow healing. Defects and alterations in the sausages.

Topic 10.- Clean ham. List of conditions for making Serrano ham. Control seal. Raw material: selection criteria. Additives. Description of the production process: reception, salting, post-salting, drying / maturation and final conditioning. Fast-curing and slow-curing ham processing technology. Defects and alterations of cured ham.

Topic 11.- Baked ham. Classification and Quality Standards. Raw materials and additives. Formulation and preparation of brine. Description of the manufacturing process: Preliminary operations, injection, massage, modeling, baking and final conditioning. Ham "minva zero". Alternatives and new technologies for the manufacture of cooked ham. Defects and alterations of cooked ham.

Item 12.- Heat treated meat products. Classification and Regulations of heat-treated meat products. Cooked sausages: Raw materials and formulation. Manufacturing technology: mincing / emulsion, drawing, cooking / smoking and final packaging. Coextrusion system for making sausages. Mortadella: Ingredients and formulation. Description of the production process. Pâtés: Ingredients and formulation. Description of the production process.

Item 13.- Packaging. Industrial slicing and packaging systems. Packaging of fresh meat and meat products in modified atmospheres. Selection of gas mixtures.

CHAPTER IV - TRACEABILITY AND ENVIRONMENTAL IMPACT

Item 14.- Traceability in the meat sector. Definition of traceability. Backward traceability. Internal traceability. Forward traceability. Phases for the start-up and improvement of a traceability system in slaughterhouses, cutting rooms and meat processing plants.

Item 15.- Environmental impact of the meat industry. General analysis of the pollution produced by the different types of facilities in the meat sector: slaughterhouses, cutting rooms and meat processing plants. Detection and analysis of operations with significant environmental impact.

CHAPTER V - FISHERY PRODUCT MANUFACTURING TECHNOLOGY

Subject 16: Technology of manufacturing of Products of the fishing

CHAPTER VI- OVOPRODUCT PRODUCTION TECHNOLOGY

Item 17: Technology for making egg products

CHAPTER VII- TECHNOLOGY OF ELABORATION OF PREPARED DISHES

Item 18: Technology of preparation of prepared dishes

Practical activities

Visits:

- Slaughterhouse and cutting room. Pork, beef and poultry lines
- Industrial plant for the production of cured and cooked meat products

Methodology

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

Teaching activity	DescriptiON	Classroom classes		Non-attending classes		Evaluation	Total time/ECTS
		Objectives	Hours	Load of work for the student	Hour	Hours	Hours
Magistral lessons	Magistral classes (Classroom big group)	Explanation of main concepts	36	By studying: To know, understand and resume knowledges	56	4	
Problems and cases	Participatory classes	To solve cases	10	To developpe and acquiere habilities for solving problems and cases	20		
Seminars	Participatory classes (Medium group)	Carrying out activities of discussion or application	4	Solving problemes and cases. Discussions	8		
Visits	To visit farms and/or factories	Attandance of the visits	6	To prepar, redact and deliver reports	2		
Leaded activities	Student's work (individual or in group)	To orient the student in work (during tutorial time)	4	To carry out practical works (bibliographic, others)			
Total			60		86	4	150/6

If, for health reasons, or other unforeseen circumstances, teaching activities cannot be carried out in the classroom, they will take place remotely.

DEGREE IN AGRICULTURAL AND FOOD ENGINEERING

Teaching activity	Description	Classroom classes		Non-atrtending classes		Evaluation	Total time / ECTS

		Objectives	Hours	Load of work for the student	Hours	Hours	Hours
Magistral lessons	Magistral classess (Classroom big group)	Explanation of the main principles	36	By studying: To know, understand and resume knowledges	60	4	96 h/ 3.84
Problems and cases	Participatory classes (Medium group)	Aplication of the theoretical concepts explained in classroom	6	Solving of problems and cases	14		20 h/ 0.72
Leaded activities	Treball individual o grup	To orient the student in work (during tutorial time)	2	Consulting of documents and bibliographic sources Redaction and presentation of informs and reports	22		12 h/ 0.48
Visits	Visits to 2 factories	To have a visual and direct knowledge of food processes	8	Redaction of informs	4		12 h/ 0.48
Total			56		90	4	150 h/ 6

If, for health reasons, or other unforeseen circumstances, teaching activities cannot be carried out in the classroom, they will take place remotely.

Evaluation

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

Learning activities	Evaluation	Number	Weight
Master Classes	Tests on matters of the subject	2	95 (50+45)
Seminars, visits, and solving of problems and cases	Redaction of reports; presentations.	3	5
Total			100

Minimum grade for compensation od partial grades is 4.0/10. Different activitties than tests are to be taken into the final grade only if avegage test is equal or higher than 5.0 /10.

To succed this subject, It is necessary to get 5.0/10 final grade. In case this condition is not met, the maximum score of the subject will be 4.5 points.

Note: If for health reasons, or other unforeseen circumstances, it is not possible to carry out face-to-face tests, these will take place remotely.

DEGREE IN AGRICULTURAL AND FOOD ENGINEERING

Kind of activity	Evaluation	Number	Weight on thfinal grade
Master classes	Tests	2	70
Solving of cases and problems	Delivering of reports and attendance and participation in presentations	2	30
Total			100

Notes

For the purposes of the final grade, to pass the course it will be necessary to have obtained in the set of tests a cumulative total equal to or greater than 5.0 points out of 10.

The average grade of Partial I and Partial II must be equal to or greater than 5 out of 10 to pass the course and, in turn, compute the rest of the activities. The norts of the partials I and II must be greater than 4 out of 10 for these to be averaged.

If for health reasons or other unforeseen circumstances, it is not possible to carry out face-to-face tests, these will take place virtually.

Bibliography

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

Basic bibliogrphy

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PRANDL, O.. "Tecnología e higiene de la carne". Acribia (1994)

PRICE, J.F, SCHW EIGERT, B."Ciencia de la carne y de los productos cárnicos".2ª ed. Acribia (1994).

REICHERT, J.E. "Tratamiento térmico de los productos cáрни-cos". Acribia. Zaragoza (1988).

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Complementary bibliography

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DEGREE IN AGRICULTURAL AND FOOD ENGINEERING

SECTION I: MEAT INDUSTRIES

Basic Bibliography

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SECTION II: DAIRY INDUSTRIES

Basic Bibliography

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Timm, F. Fabricació de helados. Ed. Acribia (1989).

Magazines:

Industrias lácteas españolas (I.L.E.)

Le lait

Il latte

Tecnología láctea

International dairy journal

Journal dairy science

Netherland milk dairy

Journal dairy research

Milchwissenschaft