Universitat de Lleida

DEGREE CURRICULUM

FOOD SAFETY SUPPLY CHAIN

Coordination: MOLINO GAHETE, FRANCISCO

Academic year 2021-22

Subject's general information

Subject name	FOOD SAFETY SUPPLY CHAIN
Code	100326
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION
Typology	

Degree	Course	Character	Modality
Double bachelor's degree: Bachelor's Degree in Veterinary Medicine and Bachelor's Degree in Science and Production	5	COMPULSORY	Attendance-based

Course number of credits (ECTS)	6
Type of activity, credits, and groups	

Activity type	PRALAB	PRAULA	TEORIA
Number of credits	0.8	1.2	4
Number of groups	4	2	1

Coordination	MOLINO GAHETE, FRANCISCO
Department	FOOD TECHNOLOGY
Teaching load distribution between lectures and independent student work	On-site time: 60 h Off-site time: 90 h
Important information on data processing	Consult this link for more information.
Language	Catalan: 50% Spanish: 25% English: 25%
Distribution of credits	Master classes: 4 credits Lab practices: 0.8 credits Seminars (problem solving): 1 credits Exams: 0.4 credits

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
COLAS MEDA, MARIA DEL PILAR	pilar.colas@udl.cat	4,4	
MOLINO GAHETE, FRANCISCO	francisco.molino@udl.cat	1,6	
PASCARI , XENIA	x.pascari@gmail.com	3,6	

Subject's extra information

Common subject in the degrees of Veterinary and Science and Animal Production (CSA) with mandatory character.

Learning objectives

The mission of a veterinarian is not restricted to the knowledge of the morbid states of the animal and the conditions that a farm must meet to achieve maximum productive performance, its responsibility extends to the processes of obtaining and transforming safe food to people.

Main goal

- Knowledge of technological processes in the food chain, food science, traceability and food safety.

By acquiring knowledge about the chemical composition, alterations, and preservation and diversification treatments of food, it serves as the basis for acquiring skills in food technology, quality control, food safety and its role in Public Health, as well as the procedures to carry out the risk analysis.

Specific objectives:

- Know the main components of food, recognize the importance of sensory, nutritional and safety properties in food quality.

- Understand the microbiological and biochemical foundations of determining food alteration and the foundations of conservation systems.

- Assess the quality of raw materials and identify the technologies used for their management, conservation and transformation.

- Evaluate the effects that different technological operations have on raw materials of animal origin and on the quality parameters of processed foods.

- Know the principles related to food processing and preservation required to design, implement and supervise food quality and safety management systems in the food industry.

- Apply food risk monitoring and surveillance systems.

- Apply the methodology recommended by the OIE for risk analysis in animals and products of animal origin.

- Identify aspects of food security that affect public health.

- Recognize the dangers that may be present in a food and recognize the risk for different consumers.

- Recognize the procedures to manage and communicate food risk

- Relate the problem of food poisoning with the responsible etiological agents.

- Assess the influence of the intrinsic and extrinsic characteristics of food on the presence or persistence of a hazard.

Competences

VET General Competences:

- CG1: Hygiene control, inspection and technology for the production and processing of food for human consumption from primary production to the consumer.

- CG5 Knowledge and application of the legal, regulatory and administrative provisions in all areas of the veterinary profession and public health, understanding the ethical implications of health in a changing global context

- CG6 Development of professional practice with respect to other health professionals, acquiring skills related to teamwork, efficient use of resources and quality management

- CG7 Identification of emerging risks in all areas of the veterinary profession

The **competences specifics** below derive from the specific powers of Order ECI 333/2008 which are included in the block of Hygiene, Technology and Food Safety in the memory of the Degree. This Order indicates that the student upon passing the subject will be competent to:

- CE03 Identify and apply the principles and bases in Morphology, bionomy and systematics of animals and plants of veterinary interest

- CE31 Know and identify the components and characteristics of food, technological processes for obtaining, processing, as well as the changes, alterations and adulterations that all foods of veterinary interest may undergo.

- CE32 Know the sanitary criteria and legal bases of the inspection as well as apply the ante and post mortem veterinary inspection regulations.

- CE34 Apply the bases of handling control and treatments in all establishments and products of veterinary interest, considering food safety and public health regulations.

- CE35 Know the bases of food risk analysis: Risk determination, management and communication

- CE36 Identify outbreaks of food poisoning, apply the bases of epidemiology, monitoring and surveillance protocols, as well as apply the dynamics and demographics of infection and poisoning.

In addition, together with other subjects of the double degree, you may be competent to:

a) Know the different agents and elements of the food chain involved in guaranteeing its safety and traceability.

b) Carry out risk analysis, including environmental and biosafety, assess and manage them.

c) Know the factors that influence the quality of products of animal origin.

d) Know the technological processes of obtaining and preserving food.

e) Manage a monitoring and surveillance system throughout the food chain

f) Know and interpret the fundamentals of the processes of the food processing industry of animal origin.

g) Design, implement and supervise the quality management systems used in the food industry.

h) Advise food companies on the transformation of food of animal origin on aspects related to food security.

i) Demonstrate knowledge and understanding of the principles of food science and technology, quality control of processed foods and food safety.

Strategic competences:

a) Take advantage of the good location of our University within a territory with a powerful agri-food sector.

b) Motivate students to carry out their internship in an industry in this sector.

Regarding the competences for the Animal Production Degree:

General Competences:

- CG1 Identify animals and animal products, as well as their importance in society and in the food chain.

- CG2 Use the knowledge of basic sciences (biology, physics, biochemistry, physiology, mathematics, statistics, economics, ...) to understand animal processes and their involvement in the agro-livestock system.

- CG3 Analyze the strategies of animal production as a whole (facilities, behavior, welfare, nutrition, improvement, production, reproduction, environment, economy, marketing and product quality) with the aim of optimizing production.

- CG4 Manage animal production systems with the aim of increasing efficiency (technical, economic, environmental, ...) and the sustainability of the food chain over time.

Specific Competences:

- CE 20 Describe the structure of the productive sector, the market and the product marketing channels. Identify the different agents and elements of the food chain in order to guarantee its safety and traceability. Assess the factors that influence the quality of food of animal origin.

Subject contents

Week1		Presentation, teaching guide, history of food technology, importance and professional career
	L1	Food components (6h): interest in the functional and technological properties of Water (aw), carbohydrates, (English)
Week2		Lipids and proteins, (English)
Week3		Vitamins, minerals (causes of losses during processes), additives, food dispersions (gels, emulsions, foams). (English)
Week4	L2	Food altering agents (6h), factors that determine the speed of alteration. Physical chemical (lipid rancidity, non-enzymatic browning). Biological factors (enzymes and microorganisms). (English)
Week5	L3	Food danger agents (6h) Zoonoses and other causative agents of diseases of food or water origin. Description of the main parasitic zoonoses, bacteria and pathogenic viruses of mainly food or water transmission ...
Week6		...Origin, characteristics, transmission routes, epidemiology, and prevention and control measures. Other foodborne pathogens: pollutants and chemical residues, naturally toxic. Food allergies and intolerances.
		Combase ® predictive microbiology seminar (2h)
Week7	L4	Food preservation processes (10h): general strategies, combination of technologies, cold preservation (refrigeration, freezing)

		Conservation by controlled atmospheres, aw reduction (psychometric diagrams), dehydration, lyophilization, evaporation, concentration ...
Week8		...Chemicals (additives) acidification, fermentation, high pressures, ultrasonic electrical pulses.
		Conservation by heat: foundations, pasteurization, blanching, sterilization
Week9		Dt, Z value determination seminar, botulinum cooking, interpretation of DTT, FTz graphics, heat penetration (2h)
Week10	L5	Food safety management (10h): Risk analysis: Importance for public health and for the food industry. Role of national and international organizations. Food risk assessment. Identification and characterization of hazard factors and determination of exposure. Main tools to carry out the Risk Assessment.
Week11		Risk management. The role of administrations and food establishments. Main management rules to guarantee the safety and quality of food in food establishments. Risk communication. The social perception of risks related to food. RASFF / SCIRI / RENAVE / BES / AECOSAN / EFSA
		The food alert procedure. Information directed to consumers. Food labeling in food safety.
Week12		Factors that affect the growth of microorganisms in food and their effects on food safety and edibility. Microbiological criteria. Seminar: Considerations in establishing the shelf life (2h) of food and procedures for its evaluation. Related to predictive microbiology seminar.
		seminar: Food labeling in food industry (2h) Seminar: Risk assessment in the food industry (2h)
Week13	L6	Traceability and traceability seminar (2h)
1er parcial		Basic food technology practices, laboratory equipment management. (4h)
2º parcial		Practices of thermal inactivation of microorganisms: Related to topic 4. (4h)

Methodology

(1). Master classes. Explanation of the main concepts taught in the subject.

(2). Solution of problems and cases simulating real situations (participatory classes).

(3). Seminar (participatory class).

(4). Directed activities: tutorials.

Development plan

The teaching of the subject is distributed in 36 hours (3.6 ECTs) of participatory master classes, where the students previously have the documentation. At the end of each session, questions will be asked about the most notable topics of the session. The seminars involve 10 hours of teaching (1.2 ECTs), with special emphasis on solving real situations related to predictive microbiology, thermobacteriology, risk assessment, useful life, traceability. The practical teaching will be taught at the Food Technology pilot plant in 8 hours (0.8 ECTs) and will deal with the handling of laboratory equipment in the food industry and microbial inactivation.

Evaluation

There will be two written or partial tests that will consist of test questions (80% of the final grade) and short

questions (10% of the final grade) related to theory classes and seminars. 10% of the remaining final grade is the evaluation of the practice reports. Each part / written test will last 2 hours (0.4 ECTs) and you will have to pass 50% each written test to pass the course and be able to add the mark of the evaluations obtained in the practices. The final grade in the case of failures is calculated with the average of the partial exams that have obtained at least 4.

Attitude to follow before a voluntary or accidental infringement in the rules for taking the exam: The voluntary or accidental infringement of the rules for taking the exam prevents its assessment, so the offending student will take an oral exam of the subject to establish their knowledge on the subject. If the intent of the deception is confirmed, it will be considered a very serious ethical fault, and the Services Inspection will be notified to take the disciplinary measures it deems appropriate.

Bibliography

Bibliography:

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Bello, J., Mª.I. García-Jalón, A. López (2000) Fundamentos de seguridad alimentaria. Ediciones Eunate. Costa, R., K. Kristbergsson, (2009)

Predictive modelling and risk assessment. Springer, nova York. ICMSF. (2004)

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Microorganismos de los alimentos. 7, análisis microbiológico en la gestión de la seguridad alimentaria. Zaragoza: Acribia Jay, J.M. (2000)

Microbiología moderna de los alimentos. Acribia, Zaragoza Koopmans, M., D.O. Cliver, A. Bosch (2008)

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La gestión de la seguridad alimentaria. Barcelona: Ariel. Luning, P. A., Devlieghere, F., & Verhé, R. (2006).

Safety in the agri-food chain. Wageningen:Wageningen Academic. McElhaton, A, R.J. Marshall.(2007).

Food Safety. A practical and case study approach. Springer, Nova York Polledo, J.F. (2002)

Gestión de la seguridad alimentaria. Mundi-Prensa, Madrid WHO (2009).

URLs FOOD Safety:

OMS sobre seguretat alimentaria: http://www.who.int/fsf/

Servei de seguretat i inspecció alimentària de la USDA americà: http://www.fsis.usda.gov/

International Food Safety Council: http://www.foodsafetycouncil.org/

FDA (Food and Drug Administration) : http://www.fda.gov/Food/default.htm

Codex Alimentarius: http://www.codexalimentarius.net

Autoridad Europea de Seguridad Alimentaria: http://www.efsa.eu.int

Agencia Española de Seguridad Alimentaria y Nutrición: http://www.aesan.msc.es

Agència catalana de Seguretat Alimentària: http://www.gencat.cat/salut/acsa/

Food Safety Agency: http://www.food.gov.uk/

La seguridad alimentaria en Europa: http://ec.europa.eu/food/food/index_es.htm