

Academic Year/course: 2021/22

30831 - Meat and Fish Technology

Syllabus Information

Academic Year: 2021/22

Subject: 30831 - Meat and Fish Technology

Faculty / School: 105 - Facultad de Veterinaria

Degree: 568 - Degree in Food Science and Technology

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Compulsory

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology applied in this subject is as follows: 40 lectures of 50 minutes with the possibility for students to raise their questions and comments at the end of each class; students will have all the presentations in the ADD of the University. 20 hours of practical classes to be conducted in laboratories and in the Pilot Plant of Food Science and Technology of the University of Zaragoza. Students previously will have the protocols to prepare practices. 10 hours of seminars where the students individually or in groups of up to 3 people will present and defend a work related to one theme of the subject.

Students must follow the regulations described in:

- Prevention: A guide for students at the University of Zaragoza:
https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/guia_preventiva_para_estudiantes.pdf
- Manual de seguridad en los laboratorios de la Universidad de Zaragoza y normas marcadas por la Unidad de Prevención de Riesgos Laborales:

https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/manual_de_seguridad_en_los_laboratorios_de_la

<https://uprl.unizar.es/inicio/manual-de-procedimientos>

In addition, students will follow as well any instructions related to biosecurity given by the professor

4.2. Learning tasks

The learning process of the subject is described below. The subject has been structured in 7 blocks with specific contents. Each of them included theoretical and practical lectures. The total of lectures is: 40 theoretical lectures of 1 hour and 10 practical sessions of 2 hours (the practical sessions will be developed in a Processing Plant of Food Science and Technology, in labs or in a Sensory room). The students will prepare a presentation related to a topic of the subject that will be oral presented and defended.

4.3. Syllabus

The program that the student is offered includes the following activities:

BLOCK 1.- FRESH MEAT: BASES, QUALITY AND TECHNOLOGY (theoretical 12 hours: practical 4 hours)

Unit 1.- Introduction. Importance of meat and fish industries. Specific characteristics of these sectors.

Unit 2.- Transformation of muscle to meat. Structure and functionality of striated muscle. Rigor mortis. Postmortem muscle metabolism. Factors of influence in the process. Meat aging. Changes in the muscle structure and nitrogen compounds. Endogenous proteolytic enzymes. Main factors affecting the process. Optimal conditions of aging.

Unit 3.- Anomalous Rigor mortis. Stress ante-mortem and its effects. DFD and PSE meats. Sensory and technological properties of those meats. Growth promoters and their effects. Meat chilling. Cold shortening: basis and consequences.

Unit 4.- Meat quality parameters: color, texture, odor, flavor and water holding capacity. Ante-mortem and post-mortem factors affecting meat quality.

Unit 5.- Measurement of meat quality parameters. Meat technological properties measurement. The influence of fat on quality. Quality certified meat products.

Unit 6. Industrial obtention of meat. Slaughter technology, dressing and carcass preparation. Carcass classification. Industrial slaughterhouses for bovine, ovine, pork and poultry. Electrical stimulation of carcasses. Cutting and meat categories. Industrial cutting of pig carcasses.

Unit 7. Meat chilling. Industrial equipment. Meat shelf-life: main factors involved and how to improve it. Meat freezing. Industrial equipment. Effects of freezing on sensory and technological properties of the meat. Thawing.

Unit 8. Packaging and sale of meat. Packaging systems and their effects on meat preservation. Vacuum and modified atmosphere packaging. Packaging materials. Distribution and sales systems.

BLOCK 2. SEAFOOD: FRESHNESS, QUALITY AND TECHNOLOGY (theoretical 4 hours: practical 2 hours)

Unit 9. Introduction. Variability in the composition and its causes. Fish classification based on their composition. Specific lipids of fish and its importance in the technology. Fish and seafood connective tissue.

Unit 10. Methods of stunning and slaughter: effects on quality. Differential characteristics of rigor mortis. Most important parameters and their control.

Unit 11. Fisheries and quality. Factors of influence on fish quality. Main quality parameters. Quality and freshness indexes for fish and seafood.

Unit 12. Cooling of fish. Fish cooling methods. Ice: types and effects. Freezing: freezing rate and its influence on product quality. Frozen storage. Freezing: critical points and their control. Thawing.

Unit 13. Packaging and preservation of fish and seafood. Vacuum and modified atmosphere packaging. Gases and materials. Packaging systems and equipment. Freezing: critical points and their control. Thawing.

BLOCK 3. MEAT PRODUCTS TECHNOLOGY (theoretical 4 hours)

Unit 14.- Classification of meat products according to their technological processing. Initial operations, storage and processing used in the preparation of meat products: salting, nitrification, drying, heat treatment, smoking, spicy, acidification, cooling, ripening, chopping and mixing, emulsifying, gelling, stuffing, packaging, etc.

Unit 15.- Additives and other ingredients used in the meat industry. Chemical preservatives. Sensory modifiers. Bulking agents. Multifunction agents. Use of additives related to quality of the products.

BLOCK 4. FRESH MEAT PRODUCTS TECHNOLOGY (theoretical 4 hours)

Unit 16.- Fresh meat products; characteristics. Sausages, formed, chopped, whole, marinades, restructured, etc. Formulation criteria. Specific technology elaboration. Industrial equipment. Distribution and preservation systems.

Unit 17.- Precooked and cooked meat; differential characteristics. Formulation criteria. Specific processing technology. Industrial equipment. Distribution and preservation systems; freezing.

BLOCK 5. DRY- CURED MEAT PRODUCTS TECHNOLOGY (theoretical 4 hours: practical 4 hours)

Unit 18.- Whole cured meat products: dry-cured ham and similar products. Impact of quality of the raw material in the final product. Formulation. Phases of the process. Modifications suffered in the ripening and drying. Industrial equipment. Decision criteria and process control. Accelerated processes. Defects and disorders. Other whole cured meat products.

Unit 19.- Dry-cured sausages. Formulation criteria. Phases and processing alternatives. Industrial equipment. Modifications undergone during ripening and desiccation. Criteria decision and process control. Accelerated processes. Defects and disorders. Specific dry-cured sausages.

BLOCK 6.- COOKED MEAT PRODUCTS TECHNOLOGY (theoretical 4 hours: practical 4 hours)

Unit 20.- Whole cooked meat products: cooked ham and other similar products. Selection of ingredients. Criteria for brine formulation. Phases and alternative processing. Industrial equipment. Factors that determine the performance, stability and product quality. Criteria decision and process control. Defects and disorders. Other whole cooked meat products.

Unit 21.- Chopped cooked meat products; emulsion type cooked products: cooked sausages, mortadella, etc. Ingredients and formulation criteria. Phases and alternative processes. Industrial equipment. Factors that determine the performance, stability and product quality. Decision criteria and process control. Defects and disorders. Specific processing technology and products based on liver, blood and collagen-rich meats.

BLOCK 7.- FISH AND FISH PRODUCTS TECHNOLOGY (theoretical 8 hours: practical 6 hours)

Unit 22.- Fish preservation by salting. Salting methods. Types and characteristics of the salt. Most common defects: causes and solutions. Cod salted processing.

Unit 23.- Smoked fish. Smoked systems. Smoke characteristics. Processing methods: advantages and drawbacks. Specific products: quality and food safety.

Unit 24.- Canned tuna: most important species used. Elaboration process. Semi-preserved fish products. Salted anchovies. Marinades and cooked-marinades.

Unit 25.- Surimi and derivated products. Surimi making process. Gelling: features and products. Technology manufacturing process crab analogs. Process technology of elver analogues.