Department of Food Science & Nutrition
UNIVERSITY OF THESSALY

TECHNOLOGY AND QUALITY OF MEAT AND FISH PRODUCTS
COURSE OUTLINE

GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	FOOD SCINECE AND NUTRITION		
COURSE LEVEL	*Undergraduate*		
COURSE CODE	ME813	**SEMESTER**	8th
COURSE TITLE	TECHNOLOGY AND QUALITY OF MEAT AND FISH PRODUCTS RESPONSIBLE: M. KAKAGIANNI		

INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
	Lectures	3	6
	Lab Lectures-exercises	3	

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	*Scientific Area*
PREREQUISITES:	
LANGUAGE OF TEACHING AND EXAMINATIONS:	GREEK
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES
URL	**https://food.uth.gr/poiotikos-elegxos-kreatos/**

TEACHING RESULTS

Teaching Results
TECHNOLOGY AND QUALITY CONTROL OF MEAT AND FISH is a special science course background in the concepts of meat and fishery technology and quality control. Its material course aims at learning the basic elements of muscle anatomy in order to identify the of pieces resulting from the coarse and detailed cutting of the carcasses and their indicated use, its chemical and biochemical composition, postmortem changes as well as and the methods of stunning and slaughtering the carcasses in order to understand the effect of their manipulations in the quality of the carcass and meat, the well-being of the animals and the personnel safety, the key factors affecting the quality and technological characteristics of meat and meat products for the purpose of producing food which meet the needs of the modern consumer, familiarity with measurement methods and assessment of the important physicochemical characteristics of carcass and meat quality, the classification of meat products, the selection of raw and other materials, the preparation methods, h packaging, the preservation of heat treatment and ripening products, the prevention, the evaluation of defects that cause quality degradation, with the aim of producing quality and hygienic products. In addition, the course aims to understand the chemical composition and biological value of the flesh of fish, nitrogenous compounds-proteins, fats, polyunsaturated fatty acids and human nutrition, carbohydrates, vitamins, minerals, the main factors that affect the qualitative and technological characteristics of catches and assessment of the quality of fish, of fish evaluation indicators, the preservation and processing of catches (cooling - freezing, drying, salting, smoking, canning), of chemical and microbiological analyses. Byproducts of fish (roe, fishmeal, liver oil, caviar, taramas, brik, surimi). Quality control assessment of processed catches. Products of marine organisms produced with biotechnological

methods. Exploitation of fish of small commercial value. Legislation

The aim of the laboratory part of the course is to enable the student to applies, in an effective way, preservation technologies of meat and fish, to carries out official laboratory controls (organoleptic, physicochemical, microbiological), and meat and fish safety and quality management systems to assess their safety and quality. Upon successful completion of the course, the student will be able to:

- identifies the pieces resulting from coarse and detailed cutting of carcasses and their indicated use,
- understands the chemical and biochemical composition of muscle tissue
- knows the post-mortem changes of meat and fish related to the treatments that are applied to their maintenance as well as the effect of stunning methods and of slaughtering animals for carcases on the quality of the carcase and meat, the welfare of the animals and the staff safety.
- knows slaughterhouses and animal and poultry slaughtering methods
- knows the quality classification of animal and poultry carcasses • has familiarized himself with the methods of measurement and evaluation of the important physicochemicals characteristics of the quality of the carcass and the meat as well as the catch.
- knows the preparation methods of various meat products
- understand the effect of biological-biochemical factors on its quality and appropriateness meat intended for processing
- knows the processing and preservation procedures of meat and its products
- is familiar with the control of the quality characteristics of meat products
- has an understanding of meat production, hygiene, preservation, inspection, spoilage, legislation and meat products.
- knows the quality classification of catches,
- knows how to control the quality characteristics of catches,
- knows the effect of biological-biochemical factors on their quality characteristics catch,
- knows the production, hygiene, processing, maintenance, inspection, alterations, legislation of catches

General Skills

1. Search, analysis and synthesis of data and information, using and necessary technologies.
2. Adaptation to new situations.
3. Decision making.
4. Autonomous work.
5. Group work.
6. Project planning and management.
7. Exercise criticism and self-criticism
8. Promotion of free, creative and inductive thinking

CONTENT

LECTURES
1.Meat-Poultry
- Structure of striated muscle (muscle bundles, connective tissue, adipose tissue, vessels and nerves).
- Structure of the muscle fiber (sarkelyma, muscle fibrils, sarcoplasm, nuclei, color of muscle fibers, white and red muscle fibers).
- Chemical and biochemical composition of the muscle (muscle fibril proteins, striated muscle function, proteins of connective tissue and organelles, lipids, carbohydrates, minerals, water, water holding capacity of muscle tissue).
- Conversion of muscle tissue to meat (ATP effect on post-mortem changes, post-mortems glycolysis, course of postmortem stiffness, postmortem changes of proteins and I.S.Y., meat maturation).
- Organoleptic characteristics and nutritional value of meat.
- Cooling and preservation of chilled meat (cooling of meat, methods of cooling carcasses and of meat, preservation of the frozen state, problems and changes of meat during cooling and refrigerated storage).
- Abnormal meat quality deviations (PSE, DFD-meat, glycolysis, generation, control conditions, effects on meat and meat products).
- Technology of meat products.
- Pasteurized sausages (choice of raw material, sodium chloride, water, flavorings, additives and auxiliaries, binding of water and fat – formation of the pasteurized structure sausages, preparation

of the meat paste, salting – formation – preservation of the color, storage, heat treatment, cooling – preservation – packaging).
• Quality of pasteurized sausages (Defects due to improper choice of the first matter, casings, NaCl, water, additives and auxiliary materials, preparation of meat paste, nitrites, color auxiliaries, meat paste filling, heat treatment and smoking, packaging, maintenance. Defects in texture, color, appearance, taste and smell).
• Cured products (microbiological stability of cured products, cured sausages, selection of raw material, sodium chloride – auxiliary – flavoring – additives, preparation of cream cheese, filling, ripening, factors and control parameters during the production of curing cured meats, the importance of microorganisms during production, defects due in micro-organisms, smoking of sausages, curing – dehydration, packaging, sale, maintenance. Preventive control measures.
• Quality of curing sausages (Defects due to inappropriate selection of raw material, cases, additives and auxiliary materials, potassium sorbate, preparation of cream mass, filling, ripening external, internal and control factors, dosing, packaging, maintenance. Defects texture, color, appearance, taste and smell).
2. FISH
• Systematic classification, anatomy and physiology of fish. The main catches (fish, molluscs, crustaceans).
• Chemical composition and nutritional value of fish.
• Organoleptic characteristics of catches
• Qualitative characteristics (inspection) of catches. Postmortem changes (organoleptic, biochemical, microbiological). Catch sampling methods
• Catch preservation methods
• Quality control (chemical/biochemical/physical, microbiological, organoleptic tests) of catches. Quality changes and shelf life of fishery products. Quality features and standards
• Assessment and management of catch safety and quality. Good hygiene practices and industrial practices (GHP/GMP). Hazard Analysis Critical Control Points (HACCP)
• Catch processing
• Preservation and packaging of catches
• Fish by-products (roe, fishmeal, liver oil, caviar, taramas, brik, surimi etc.).
• Legislation. Special health rules and official controls on fishery products. European legislative framework for the safety and quality of fish
LAB EXERCISES
1.Meat-Poultry
• Slaughter and operation of slaughterhouses
• Elements of anatomical and comparative anatomy of animals
• Cutting up animal carcasses
• Categorization and quality grading of carcasses
Measurement of active acidity (pH) and total acidity of meat and its products- Freshness test – Measurement of water activity
• Differentiation between frozen and fresh meat – Meat tenderness measurement
• Color measurement of meat and its products
• Meat packaging
• Oxidative rancidity – Determination of thiobarbituric acid number
• Moisture determination
• Water holding capacity and water loss during cooking
• Defects in meat products
• Determination of starch in meat products
• Determination of nitrite content of meat preparations
• Determination of sodium chloride content of meat products
• Hygiene – Meat safety and implementation of the HACCP system in the meat industry
2.Fish
• Sampling.
• Systematic ranking. Anatomy of fish, molluscs, molluscs. Performance data.
• Chemical composition of the catch. Specific pathogenic flora of fresh fishery products.
• Biochemical and biological functions and quality of fresh catches (organoleptic control,
• Biochemical spoilage indicators, physical methods, bacteriological methods, safety and hygiene).
• The role of the various components of the catch in determining the quality and possibility for processing (fat, proteins, carbohydrates, pigments in catches, minerals, vitamins, nitrogenous components).
• Handling of fresh catch (maintaining the quality of fresh catch in relation to the species, fishing

season and area, spoilage, causes of spoilage, manipulations on the fishing vessel, hygiene of fishing vessels and containers and hazard critical point assessment (HACCP)).
• Preservation of catches by various treatments (drying, salting, smoking) (salting of catch, water content and storability, water activity and microbial spoilage, smoking of catch, basic components of tobacco).
• Laboratory control of quality characteristics and hygiene and safety parameters of fresh, frozen and processed fishery products

TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHOD.	Face to face lectures in the auditorium/classroom and face to face laboratory exercises in an appropriate laboratory.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	• Use of I.C.T. in Teaching, in Laboratory Education, in Communication with the students • Use of ICT in Teaching • Use of ICT in Laboratory Education (Usage software for statistical control of the quality of food) • Use of ICT in Communication with students The course material (theory and exercises) is posted in the e-class of the DFSN of UT. Communication with the students is done through announcements on the e- class. From this platform, students can communicate by email with the teacher.

TEACHING STRUCTURE	Activity Semester	Workload	
	Lectures	39	
	Lab exercises	39	
	Study and analysis bibliography	10	
	Writing assignment/assignments	12	
	Independent study	25	
	Course Total: *(25 hours of workload per credit unit)*	**125**	

EVALUATION OF STUDENTS	1. Written exam (70 %): - Multiple choice questions (Formative, conclusion) - Short development questions (Formative, conclusion) - Extended development questions (Formative, conclusion) - Problem Solving (Formative, Deductive 2. Lab grade (30%): - Short answer questions - Development questions - Solving problems (exercises) - Evaluation of laboratory reports - assignments

BIBLIOGRAPHY

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• Meat technology, Bloukas Ioannis G., 1st Edition, 2017, UNIBOOKS IKE Publications
• TO KREAS AND ITS PRODUCTS, S.A. GEORGAKIS (collective work), 1st Edition, 2005, Publishers: Christina and Vassiliki Kordali O.E.
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- Handbook of Poultry Science and Technology, Secondary Processing, Isabel Guerrero-Legarreta, Y. Hui, Alma
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