

**ADVANCED CHEMICAL, MICROBIOLOGICAL AND TOXICOLOGICAL CONTROL AND ANALYSIS OF FOOD**

**STRUCTURE**

<b>Study program</b>	<b>Food safety and biosecurity</b>
<b>Year of study</b>	I
<b>Semester</b>	I
<b>Discipline category</b>	DS
<b>Total hours per week</b>	Course - 2 hours; PA - 2 hours
<b>Total number of hours per year according to the curriculum</b>	Course - 28 hours; PA - 28 hours
<b>Number of credits transferable</b>	8

**MAIN OBJECTIVE**

To acquire fundamental knowledge of food biosecurity and turn them into instruments of operational activities involved in food technologies and food safety

Creating knowledge support for addressing future related disciplines (Authentication and food expertise, etc.)

**CONTENTS**

<b>COURSE</b>	<b>No. hours</b>
Chapter I - Quality of meat and meat products Definition and components of food quality; the role of meat and meat products in human nutrition; the structural and chemical composition of muscle tissue.	2
Chapter II. Meat and meat products microflora; Toxic compounds formed during meat processing Dynamics of microorganisms that contaminate carcasses; microbiota of raw products; microbiota of fish and shellfish; carcinogens, nitrosamines, toxic substances residues.	4
Chapter III. Methods of control and assessment of quality meat Meat quality control: an organoleptic and bacterioscopic examination of meat; physicochemical direct examination of meat; physicochemical examination of the aqueous extract from meat, techniques of analysis (sensory, physicochemical and biochemical) for assessing the quality of the fish	6
Chapter IV. Quality control of meat products Definition and classification of meat products; organoleptic examination of meat products; physicochemical examination of meat products (classic methods and modern methods); quality control of animal fats: organoleptic and physicochemical examination.	6
Chapter V. The quality of milk and milk products: The importance of milk and milk products in human nutrition; organoleptic, physical-chemical, and biochemical properties of milk; milk microflora; quality of dairy products: butter, recombined milk, acid dairy products, cheese;	4
Chapter VI. Methods of control and assessment of quality milk and milk products: Organoleptic, physicochemical and bacteriological examination of milk, pasteurization control; organoleptic, physicochemical and bacteriological examination of quality in yogurt, buttermilk, acidophilic milk, and kefir; organoleptic, physicochemical and bacteriological quality assessment in butter	6

<b>PRACTICAL ACTIVITY</b>	<b>No. hours</b>
Chapter I - Chemical methods for assessing the degree of freshness of meat: Identify free ammonia Eber reagent; -Determination of weak ammonia added (nitrogen easily hydrolysable) from meat	2
Chapter II - Determination of nitrite concentration (preservative) in meat products (Griess method)	2

Chapter III Microbiological methods for identification of Salmonella, Listeria and Escherichia coli germs in meat products (PCR analysis)	2
Chapter IV - Analyzing the degree of resistance to corrosion of meat cans by quantitative determination of tin (iodometric method)	2
Chapter V - Determination of heavy metals in fish flesh by atomic absorption spectrophotometry	2
Chapter VI - Identification of toxins in fish flesh by chromatography and their quantitative determination by fluorescence spectrometry	2
Chapter VII - Assess the degree of proteolysis of proteins in fish flesh by electrophoresis SDS-PAGE	2
Chapter VIII - Immunological methods for assessing the degree of freshness of fish meat (ELISA method)	2
Chapter IX - Quantitative determination of indices for assessing the degree of freshness in butter, sour cream and margarine ( $I_a$ , $I_s$ , $I_p$ și $I_{od}$ )	2
Chapter X - Determination of calcium content in milk by volumetric complexing	2
Chapter XI - Methods of microbiological and biochemical identification, and action of the strain of Bacillus Plantarum in milk (plate seeding and identification in the casein fraction by SDS-PAGE electrophoresis)	2
Chapter XII - Highlighting superoxide dismutase isoenzymes in meat, milk and fresh eggs by polyacrylamide gel electrophoresis (SDS-PAGE)	2
Chapter XIII - Measuring vitamin A and E from milk by HPLC	2
Chapter XIV - Oral examination	2

## BIBLIOGRAPHY

1. Banu, C., 2010 – Fish, functional food - Ed. Agir, - Bucharest;
2. Banu, C., 2004, -General biochemistry and fish biochemistry - Ed. Agir, Bucharest;
3. Ciocîrlie Nicoleta, Ilie Lucian, Ceauși Constantin, 2009 –General technologies in food industry, Ed. Printech- Bucharest;
4. Diaconescu Cristiana, 2008, General chemistry for the food industry, Ed. Printech, Bucharest;
5. Diaconescu Cristiana, Șuler Andra, 2017, Advanced methods of analysis and control of food, Ed. Agrotehnica, Bucharest;

## EVALUATION

Type of activity	Evaluation criteria	Evaluation methods	Percent in final grade %
<b>Course</b>	Knowledge accuracy and completeness; The degree to which the specialized language has been assimilated; Concepts assimilation and exploitation in interpreting concrete situations and developing pragmatic solutions, depending on the given problem;	Summative final assessment by exam (written test) during the exam session	70%
<b>Practical activity</b>	Ability to apply assimilated knowledge in practice	Continuous assessment: practical verification (20%), written verification (colloquium 10%)	30%

**Course coordination: Associate professor Ph.D. POPA Dana Cătălina**

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