2021-2022 spring semester
MSc in Food Safety and Quality Engineering

Final exam I.

List of items to assess competence in microbiological aspects of food quality and safety

1. Microbiota, spoilage and safety of raw meat. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
2. Microbiota, spoilage and safety of meat products. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
3. Microbiota, spoilage and safety of poultry, fish and game. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
4. Microbiota, spoilage and safety of milk and milk products. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
5. Microbiota, spoilage and safety of eggs and delicatessen (cold buffet foods). Characterization of dominant microorganisms and possibilities for their detection, identification and typing
6. Microbiota, spoilage and safety of vegetables and fruits (raw vegetables, dried and frozen products). Characterization of dominant microorganisms and possibilities for their detection, identification and typing
7. Microbiota, spoilage and safety of fruit juices and soft drinks. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
8. Microbiota, spoilage and safety of cereal, mill and bakery products. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
9. Microbiota, spoilage and safety of sugar and confectionery products, and spices. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
10. Microbiota, spoilage and safety of vegetable oil, margarine, coffee and tea. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
11. Microbiota, spoilage and safety of canned and heat-treated foods. Characterization of dominant microorganisms and possibilities for their detection, identification and typing
12. Novel food preservation technologies and their microbiological aspects
13. Cleaning and disinfection in the food industry; cleansing products and disinfectants. Formation and microbiological characterization of biofilms.
14. Factors influencing microbial growth and the role of predictive models in quality assurance
15. Quantitative microbiological risk assessment

List of items to assess competence in chemical and toxicological aspects of food quality and safety

1. Characteristic attributes and related test methods to assess the quality and chemical safety of **meat and meat products**. Theoretical, technical and practical aspects of applied analytical test methods.
2. Characteristic attributes and related test methods to assess the quality and chemical safety of **milk and dairy** products. Theoretical, technical and practical aspects of applied analytical test methods.
3. Characteristic attributes and related test methods to assess the quality and chemical safety of **vegetables and fruits (including juices)**. Theoretical, technical and practical aspects of applied analytical test methods.
4. Characteristic attributes and related test methods to assess the quality and chemical safety of **cereals, mill products and bakery products**. Theoretical, technical and practical aspects of applied analytical test methods.
5. Characteristic attributes and related test methods to assess the quality and chemical safety of **spices, coffee and tea**. Theoretical, technical and practical aspects of applied analytical test methods.
6. Characteristic attributes and related test methods to assess the quality and chemical safety of **edible plant oils**. Theoretical, technical and practical aspects of applied analytical test methods.
7. Characteristic attributes and related test methods to assess the quality and chemical safety of **alcoholic drinks**. Theoretical, technical and practical aspects of applied analytical test methods.
8. Characteristic attributes and related test methods to assess the quality and chemical safety of **honey**. Theoretical, technical and practical aspects of applied analytical test methods.
9. Characteristic attributes and related test methods to assess the quality and chemical safety of **drinking water and mineral water**. Theoretical, technical and practical aspects of applied analytical test methods.
10. **Chemical preservatives**, typical related food applications and analytical test methods. Theoretical, technical and practical aspects of applied analytical test methods.
11. **Validation of food testing methods**. Purpose and general procedure of validation. Performance characteristics of analytical methods.
12. Internal and external **tools and procedures in analytical quality assurance**: calibration techniques, reference materials, proficiency testing, control charts.
13. **Sampling procedures in food testing**: basics of statistical sampling. Characteristics of sampling plans, acceptance and switching criteria, influencing parameters. Sample collection methods.
14. Examples of **chemical hazards in food production**. Chemical hazards of environmental, and technological origin. Chemical hazards of additives, packaging materials. Examples on hazardous components of natural origin in raw materials or processed food products. Example of calculation of chemical risk.
15. Food quality and safety aspects of **food adulteration and food fraud**. Typical procedures and methods, potential actions and analytical tools to fight against them.

Final exam II.

List of items to assess competence in food safety and quality management, market regulation and consumer behaviour.

1. Management systems, integrated management systems, quality management systems. Concept of quality, evolution of the concept.
2. Quality management systems (ISO 9001). Food safety systems (ISO 22000 series, BRC, IFS). Food safety pyramid.
3. ISO 9001 quality management system requirements: structure of the standard, principles of quality management, hierarchy and main features of quality management documentation.
4. The principles of HACCP, the steps to implement HACCP and how to maintain the system. Links to other food safety and integrated management systems. Comparison of critical control point and prerequisite conditions.
5. Conformity assessment options of quality management and certification schemes. Main principles, types and purpose of quality audit.
6. Purpose, principles and characteristic requirements of laboratory accreditation.
7. The 'One health concept'; the 'food chain concept'; the WTO-SPS agreement, SPS standards
8. General principles and requirements of food law
9. General responsibilities of food business operators according to EU law
10. Traceability of products in the food chain (regulation 178/2002/EC). Food information to consumers (regulation 1169/2011/EU)
11. Risk analysis: concept, principles, elements, relevant EU law and institutions
12. Risk communication: types, models, principles. Risk perception of consumers.
13. Marketing research; Innovation management
14. Marketing communication; Global consumption trends
15. Distribution marketing (channels); Price marketing
16. Characteristics of dietary supplements and functional foods. Rules on consumer information on nutrition and health claims.
17. Regulation principles of nutrition labelling. Requirements relating to the provision of information to consumers on other ingredients (e.g. allergens, sweeteners, colours, GMOs, caffeine.)