SHELF LIFE EXTENSION OF PERISHABLE FOODS

Food Science and Technology course_II year

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Characteristics of the course

2 CFU module of: “Innovation and shelf life extension”

The aim:

This module provides an in-depth understanding of the factors affecting the shelf life of perishable foods from a microbiological standpoint. Students will explore mechanisms of food deterioration, conventional and emerging preservation technologies, and special attention will be given to sustainable approaches aimed at reducing food loss and waste throughout the food supply chain.

Required skills:

No formal prerequisites are required; however, in order to follow the course profitably, students should have essential basic knowledge of:

- food technology operations and processes, in order to understand the advanced applications of innovative techniques;

- food microbiology, in order to interpret the effectiveness of technologies in terms of food safety and microbiological stability;

- food biochemistry, in order to analyse the effects of technologies on the main food constituents and their functional properties.

Subjects:

Unit 1. Definition and main concepts (Specific Spoilage Organisms, spoilage markers, stress response, …). Microbial spoilage. Microbial growth dynamics and indicators of microbiological quality. Characteristics of perishable foods.

Unit 2. Mechanisms of microbial inactivation. Conventional preservation technologies. Natural preservation approaches, hurdles technology. Food waste reduction. Emerging trends and technologies.

Material for studying:

Slides, uploaded in the E-learning section (https://elearning.unite.it)

«Fundamental food microbiology» Ray B., Bhunia A., CRC Press 2025, ISBN 9781032376882

»Food microbiology: fundamentals and frontiers” Doyle, M.P., Buchanan R.L., ASM Press, ISBN 9781119739135»

Learning assessment:

About 15-minute final oral exam, during which the student must answer questions covering the entire module syllabus.

The exam evaluates the student's understanding of the whole topics of the module.

Assessment criteria include the accuracy and completeness of knowledge, the ability to apply this knowledge to real-world cases, independent judgment in evaluating technological alternatives, and the ability to communicate using appropriate technical-scientific language.

Weight of the exam:

The exam weights 2/12 of the final mark of the subject, also composed by «Shelf life calculation and estimation» and by «Advanced Technologies» module.

Other info:

Office hours: Tuesday 9.30-10.30

Contact e-mail address: aserio@unite.it

Working students are invited to contact the teacher (aserio@unite.it) to receive information on the study material and the organization of the activities.

E-learning page of the course: https://elearning.unite.it/course/view.php?id=7423