Innovation in managing fresh commodities losses

Food Science and Technology course_II year

Prof. Annalisa Serio

A.A. 2026-2027

Characteristics of the course

2 CFU module of: “Technological strategies for sustainable foods”

The aim:

This module examines the causes of losses in fresh commodities throughout the postharvest supply chain and explores innovative technological, and sustainable solutions to reduce such losses.

Students will gain a comprehensive understanding of biological, environmental, logistical, factors affecting the quality and shelf life of fresh fruits, vegetables, and other perishable commodities.

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, stress response, …). Causes of post-harvest loss, microbiological spoilage. Microbial growth dynamics and indicators of microbiological quality.

Unit 2. Conventional post-harvest technologies. Natural preservation approaches. Food waste reduction. Active packaging. 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

«Prevention and control of microbiological hazards in fresh fruits and vegetables Part 4: Specific commodities», FAO- WHO, 2023

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=7422