UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Domestication of Yeast for Food and Beverages

2425-117R-DOME

Title

Domestication of Yeast for Food and Beverages

Teacher(s)

Prof. John Morrissey

Language

English

Short description

Overview
Yeasts are widely used for the production of fermented foods and beverages. Some of these processes date by thousands of years and we now know that long before yeast were identified, humans were selecting strains with improved traits, gradually leading to the establishment of unique lineages. These strains have particular genetic changes that make there more suitable for human processes and can be described has having been domesticated. Genomic techniques enable us to now identify these changes and to reconstruct the events that led to domestication. The links between human society and strain domestication are fascinating. The knowledge gained by be used to design and build new strains for food and industrial biotechnology.

Course content:
Lecture 1

- Evolutionary and taxonomic status of yeasts
- Overview of yeasts used in food biotechnology
- Concepts of domestication
  Lecture 2
- Yeast fermentation from a historical and metabolic perspective
- Yeast in the producton of bread and beer
- Domestication of* Saccharomcyes cerevisiae*
  Lecture 3
- A historical perspective on the development of brewing in Eu-rope
- Hybrid yeast: how hybrids form and their role in domestication
- Evolution of the lager yeast Saccharomyces pastorianus
- Trends in the development of new hybrid yeasts
  Lecture 4
- Domestication of yeasts in the dairy environment
- Evolutionary history of the *Kluyveromyces marxianus* and *Kluyveromyces lactis*
- Domestication of dairy strains of *Saccharomyces cerevisiae*

**The goals of this module are for students to:

- Explain the concept of microbial domestication and its link to human society
- explain the process of yeast domestication using specific examples and case studies
- articulate how knowledge of of yeast domestication can be beneficial for new innovations in biotechnology

CFU / Hours

1 (8 hour), with in itinere evaluations

Teaching period

July 8 & 9, 2025

Sustainable Development Goals

ZERO HUNGER | GOOD HEALTH AND WELL-BEING | INDUSTRY, INNOVATION AND INFRASTRUCTURE | RESPONSIBLE CONSUMPTION AND PRODUCTION | CLIMATE ACTION