

ENG-436

Food biotechnology

Sybesma Wilbert Feike Henricus

Cursus	Sem.	Type
Biotechnology minor	E	Opt.
Ing.-chim.	MA2, MA4	Opt.
UNIL - Sciences forensiques	E	Opt.

Language of teaching	English
Credits	2
Session	Summer
Semester	Spring
Exam	Written
Workload	60h
Weeks	14
Hours	2 weekly
Courses	2 weekly
Number of positions	

Summary

The course will deliver basic knowledge on the principles of food fermentation and enzyme technology. Specific processes related to food raw materials and food bioprocessing will be described. The course will describe benefits that food biotechnology can bring during food manufacturing.

Content

- History of fermentation
- Different types of food fermentation
- Practical examples and benefits generated
- Probiotic technology
- Enzyme technology (general)
- Protease
- Lipases
- Carbohydrases
- Food bioprocessing (laboratory visit to be confirmed)

Keywords

Biotechnology, fermentation, food, enzyme, bioprocess

Learning Prerequisites**Required courses**

Basic chemistry and biochemistry

Recommended courses

It is recommended to also follow "Chemistry of food processes" by Imre Blank. Both courses will be given in the spring semester on a 4h weekly basis

- "Chemistry of Food Processes" (Imre Blank) from February 25 to April 1, and

- "Food Biotechnology" (Wilbert Sybesma) from April 8 to May 27, and

- a recap session will be organized on June 3rd.

It is also recommended to attend the course "Food chemistry" given by Bernhard Klein in French.

Important concepts to start the course

Combine knowledge related to chemistry, biology and food technology. Interest to learn how basic fermentation, enzyme technology and biochemistry is applied in food manufacturing to produce safe

products with added benefits.

Learning Outcomes

By the end of the course, the student must be able to:

- Describe basic principles of fermentation
- Describe selected fermentation systems
- Understand enzyme action and main classes of enzymes
- Understand factors related to probiotic technology
- Describe selected industrial food biotechnology processes
- Describe selected classical fermentation processes
- Describe how fermentation can deliver nutrition
- Describe basic safety aspects of fermentation

Transversal skills

- Communicate effectively, being understood, including across different languages and cultures.
- Make an oral presentation.
- Manage priorities.

Teaching methods

Lecture, short exercises, group or individual presentation on specific topic (the presentation will be individually if there are few students, or in group if there are more than 20 students). The presentation will count 20% of the final note.

Expected student activities

Attend lectures. Each student will give a 15 minutes presentation during the semester. This presentation will be given alone or as a team, depending on the number of students. A potential visit to a Nestlé research facility will be decided during the semester.

Assessment methods

The presentation will count 20% of the final note. The written exam will count 80% of the final note.

Supervision

Office hours	No
Assistants	No
Forum	No
Others	Q&A during the lectures. Short exercises during the lectures.

Resources

Bibliography

Optional: Pocket Guide to Biotechnology and Genetic Engineering. ed. Rolf Schmid, 2003. Wiley-VCH Verlag GmbH

Ressources en bibliothèque

- [Pocket guide to biotechnology and genetic engineering / Schmid](#)

Notes/Handbook

Electronic PDF Files: 1) Food Fermentation. 2) Food Enzyme Technology. 3) Cocoa Fermentation - An

Example. 4) Industrial Processes - Examples. 5) Probiotic Technology. 6) Safety Aspects in food fermentation. 7) Deliver nutrition by fermentation. 8) Bioreactors