Syllabus

Kursbeschreibung

Titel der Lehrveranstaltung	Cocoa and coffee fermentations
Code der Lehrveranstaltung	44726
Zusätzlicher Titel der Lehrveranstaltung	
Wissenschaftlich-disziplinärer Bereich	AGRI-08/A
Sprache	Englisch
Studiengang	Master in Lebensmittelwissenschaften für Innovation und Authentizität
Andere Studiengänge (gem. Lehrveranstaltung)	
Dozenten/Dozentinnen	Dott. Ali Zein Alabiden Tlais, AliZeinAlabiden.Tlais@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/38700
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Erstes Semester
Studienjahr/e	-
KP	3
Vorlesungsstunden	18
Laboratoriumsstunden	12
Stunden für individuelles Studium	45
Vorgesehene Sprechzeiten	9
Inhaltsangabe	Production, processing and fermentation of cocoa and coffee; fermentation methods and microorganisms involved in the fermentation process, metabolites produced during the fermentation, functional nutrients and/or metabolites, problems related to an unsuccessful fermentation, safety and quality of cocoa- and coffee- derived

	products.
Themen der Lehrveranstaltung	The first part of the course offers a comprehensive overview of cocoa production and fermentation, beginning with an exploration of the geographical regions where cocoa is cultivated and the biological characteristics of the cocoa tree and its beans. Students will then delve into the post-harvest processing of cocoa beans, with a particular focus on fermentation as a critical step for developing flavor, quality, and safety. The course examines the purpose and mechanisms of cocoa fermentation, detailing the sequential stages, microbial succession, and metabolic activities of key microorganisms involved. Emphasis is placed on comparing traditional versus industrial fermentation practices, and on understanding how microbial and cocoa-derived metabolites, particularly those with functional properties, contribute to the overall quality of the final product. The implications of failed fermentation are also addressed, highlighting its impact on both safety and sensory characteristics. Finally, students will study cocoa processing beyond fermentation and engage in sensory analysis to evaluate the effects of microbial transformation on the aroma, taste, and texture of cocoa and its derivatives. The second part of the course focuses on the coffee production chain, starting with an introduction to the coffee plant, berries, and global production regions. Students will explore post-harvest processing methods, with particular emphasis on fermentation as a crucial step for enhancing both the quality and safety of coffee. The course addresses the steps and types of coffee fermentation, comparing traditional and industrial approaches, while analyzing the role of microbial communities and their metabolic contributions, including the generation of functional compounds. Attention is also given to the consequences of failed fermentation and its impact on the final product. The module concludes with an overview of sensory analysis, highlighting how fermentation shapes the flavor profile and consumer perception of coffee.
Stichwörter	Cocoa, Coffee, Fermentation, Functionality, Safety
Empfohlene Voraussetzungen	To effectively follow this course, students should have a basic understanding of microbiology, biochemistry, and food science. Familiarity with microbial metabolism, fermentation processes, and the role of microorganisms in food transformation is essential. A general knowledge of biomolecules such as carbohydrates, organic

	acids, and enzymes will also support learning
Propädeutische Lehrveranstaltungen	None
Unterrichtsform	Frontal lectures (Power point and blackboard), exercises, labs, projects, etc. Presentations, scientific papers and bibliography used during the course are provided to students
Anwesenheitspflicht	No
Spezifische Bildungsziele und erwartete Lernergebnisse	-
Spezifisches Bildungsziel und erwartete Lernergebnisse (zusätzliche Informationen)	Knowledge and understanding: adequate knowledge and understanding about the fermentation process, and the role of microorganisms during the fermentation process, and the external factors related to the outcome of the fermentation. Applying knowledge and understanding: - developing the capability of integration of information, searching and analyzing the most recent studies performed by the scientific community - developing the capability of creation of strategies for carrying out an effective fermentation process, considering both biological, microbiological, chemical and environmental factors. Making judegments: Capability of identifying the information needed to develop or evaluate strategies of fermentation. Communication skills: capability of clearly and exhaustively disseminate knowledge, ideas, problems and strategies to professional or non-professional audience.
Art der Prüfung	Oral examination. The level of knowledge and understanding of the topics addressed during the course will be evaluated. The ability to disseminate the information, the ability to establish relationship between topics and the ability to give practical solutions to a problem will be considered.
Bewertungskriterien	Successful completion of the examination will lead to grades

	ranging from 18 to 30 with honors. The following aspects will be evaluated: clarity of answers, ability to summarize, evaluate, and establish relationships between topics.
Pflichtliteratur	Power point presented during the lectures, papers and key notes will be provided in the E-learning platform of UNIBZ
Weiterführende Literatur	Schwan, Rosane F., and Graham H. Fleet, eds. Cocoa and coffee fermentations. CRC Press, 2014
Weitere Informationen	No
Ziele für nachhaltige Entwicklung (SDGs)	Gesundheit und Wohlergehen