UNIVERSITEIT GENT

Studiefiche

Vanaf academiejaar 2019-2020

Food Microbiology and Preservation (0000152)

Wegens Covid19 kan mogelijk afgeweken worden van de onderwijs- en evaluatievormen. Dergelijke afwijkingen zullen via Ufora worden gecommuniceerd.

Cursusomvang *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*

Studiepunten 5.0 **Studietijd 150 u** **Contacturen** 60.0 u

Aanbodsessies en werkvormen in academiejaar 2020-2021

A (semester 2)	Engels	Incheon	groepswerk	2.5 u
			hoorcollege: plenaire oefeningen	2.5 u
			begeleide zelfstudie	2.5 u
			hoorcollege	30.0 u
			practicum	20.0 u
			demonstratie	2.5 u

Lesgevers in academiejaar 2020-2021

Devlieghere, Frank	LA23	Verantwoordelijk lesgever
Rajkovic, Andreja	LA23	Medelesgever

Aangeboden in onderstaande opleidingen in 2020-2021	**stptn**	**aanbodsessie**
Bachelor of Science in Food Technology	5	A

Onderwijstalen

Engels

Trefwoorden

Food preservation, Microbial contamination, Micro-organisms, Microbial food safety, Pathogens, Hygiene, Spoilage, Micobial analysis

Situering

The objective is to obtain a basic knowledge about the microbial aspects of food preservation, food spoilage and food safety. Based on the elementary knowledge of general microbiology, biochemistry and molecular biology, the microbial aspects of food products are discussed. The theoretical part deals with the contamination of raw materials, the factors affecting growth of micro-organisms that can result in the spoilage of food products and food poisoning, contemporary and traditional preservation methods, microbial spoilage mechanisms of specific food product (groups) and most prominent foodborne pathogens and related foodborne diseases. The practical part consists of a basic training in microbiological analysis of foods, a training in the quantification of the effect of different factors on the microbial growth, shelf life and safety of food products by predictive modelling and laboratory analysis, analysis and solutions of cases studies pertinent to actual microbiological issues found in food industry and interpretation of the microbiological criteria concerning microbial contamination of food products.

Inhoud

Theory
1. Microbial contamination of raw material
1.1. Sources of contamination
1.2. Contamination of various foods
2. Growth of microorganisms in foods
2.1. Intrinsic factors
2.2. Extrinsic factors
2.3. Implicit factors

3. Microbial aspects of food preservation
3.1. Lowering the degree of acidity
3.2. Lowering the water activity
3.3. Changing the redox potential
3.4. Use of temperature
3.5. Use of rays
3.6. Chemical preservation
3.7. Use of natural antimicrobial substances
3.8. New experimental preservation methods
3.9. Combination Technology
4. Microbial spoilage of foods
5. Microbial Food poisoning
5.1. Food intoxications
5.2. Food infections
6. Predictive microbiology
Exercises
1. Microbiological basic techniques
1.1. Sampling
1.2. Culture media
1.3. Cultivation of micro-organisms
1.4. Preparation of dilution series
1.5. Membrane filtration technique (only description)
1.6. Counting micro-organisms
1.7. Confirmation techniques
2. Methods of microbiological analysis of food products
2.1. Determination of the total amount of micro-organisms in selected food products
2.2. Spoilage flora under different storage conditions
2.3. Hygiene indicators
2.4. Pathogenic micro-organisms
(in lab exercise non-pathogenic surrogates are used due to biosafety reasons)
3. Case studies (desk work)
4. Exercise on predictive microbiology and interpretation of the outcomes
5. ***Microbiological criteria***

Begincompetenties

Basic knowledge on general microbiology and biochemistry is required.

Eindcompetenties

1 Understanding the behaviour of micro-organisms in food products and the factors influencing this behaviour
2 Being able to adapt food processes to extend the shelf life and increase microbial safety through the obtained knowledge of the microbial aspects of food preservation
3 Relating specific spoilage phenomena with specific (group of) microorganisms
4 Correlating specific micro-organisms with specific food poisoning scenario
5 Determining the microbial quality of food products through microbial analysis.
6 Interpretation of results from microbial analysis and predictive modeling

Creditcontractvoorwaarde

Dit opleidingsonderdeel kan niet via creditcontract gevolgd worden

Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

Didactische werkvormen

Begeleide zelfstudie, demonstratie, groepswerk, hoorcollege, practicum, hoorcollege: plenaire oefeningen

Leermateriaal

- *For this course a book is available: Food microbiology and analysis by Prof. dr. Frank Devlieghere (ed.), Andreja Rajkovic, Simbarashe Samapundo, Mieke Uyttendaele, An Vermeulen, Liesbeth Jacxsens and Johan Debevere. Cost: 25 EUR*

Other earning materials are lecture slides in PDF, as well as notes for practical exercises in PDF.

Referenties

Microbiological guidelines - interpretation of test results. 2018. by Prof. dr. Mieke Uyttendaele (ed.), Anja De Loy-Heyndrickx, An Vermeulen, Liesbeth Jacxsens, Johan Debevere and Frank Devlieghere, Publisher Die Keure
Modern food Microbiology. 2000. Edited by J.M. Aspen Publications, Inc
Microorganisms in foods. Part 5. Microbiological specifications of food pathogens 1996. ICMSF. Blackie Academic & Professional
Microorganisms in foods. Part 6. Microbial ecology of food commodities. 1998. ICMSF. Blackie Academic & Professional

Vakinhoudelijke studiebegeleiding

For the theory as well as for the theoretical exercises, the student has the possibility to ask extra information or explanation to the lecturer during contact hours or e-mail. The same is foreseen for the practical exercises and a supervisor or a professor can be contacted for extra information. Slides of the lectures are available via online platform.

Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijk examen met open vragen, schriftelijk examen, openboekexamen

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijk examen met open vragen, schriftelijk examen, openboekexamen

Evaluatievormen bij niet-periodegebonden evaluatie

Schriftelijk examen, participatie, werkstuk, verslag

Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is niet mogelijk

Toelichtingen bij de evaluatievormen

Examination takes place immediately after the teaching block in May. Theory: closed book written examination with open questions that cover major aspects of the course content, and require student to follow the lectures and to study from the books and provided PDF slides; open book exam which is based on a case study, in which student first prepares a written answer that is followed by an oral defence. Exercises: written examination (closed book), lab reports, participation and work on an assignment.

Eindscoreberekening

Theory: period aligned evaluation (66%). Exercises: period aligned (22%) and permanent (12%) evaluation.
Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.