Sveučilište u Zagrebu Agronomski fakultet
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Telefon: +385 (0)1 2393 777
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Cheesemaking (176007)

Nositelj predmeta

prof. dr. sc. Samir Kalit

Opis predmeta

Students are introduced to cheesemaking history, cheese definitions and classifications. In this module cheesemaking technology is postulated which starts with the milk selection and its preparation for renneting. These technological steps include milk analysis from the point of milk delivery to the cheesery, removing the mechanical waste, standardisation of the milk for cheesemaking, pasteurisation and the addition of additives and starter cultures in milk for cheesemaking before renneting. The fundamental chemical-biochemical mechanism of renneting is described. Furthermore, general rules for curd treatment is described, cheese moulding and salting in the production of different types of cheeses (fresh, soft, semi hard, hard and extra hard). This module provides general information about ripening and packaging of cheese. Knowledge about hygiene and sanitation in cheesemaking is also covered as well as the implementation of HACCP. This module provides information about the environmental protection during building, reconstruction, designing, and equipping of the cheese making plant. During the practical part of the module (exercises) students are introduced to the business organisation in a cheesemaking plant which includes calculations in the production and dealing of by-products that appear during cheesemaking such as cream, butter and whey (for instance albumin cheese – ricotta). During the laboratory practical work students are introduced to fundamental cheese analysis essential for cheese labelling. Field working includes practical work in the cheesemaking units (three different dairy plants) from milk receiving till packaging of the final products as well as cleaning maintenance of the production units. Students are introduced to the most world famous cheeses through seminars. Each student presents characteristics of a particular cheese in front of the group.

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ECTS: **6.00**

E-učenje: **R1**

Sati nastave: 60
Predavanja: 36
Vježbe u praktikumu: 16
Seminar: 8

Izvođač predavanja

- prof. dr. sc. Samir Kalit
- prof. dr. sc. Jasmina Havranek
- izv. prof. dr. sc. Nataša Mikulec
- izv. prof. dr. sc. Milna Tudor Kalit

Izvođač vježbi

- prof. dr. sc. Samir Kalit

Izvođač seminara

- prof. dr. sc. Samir Kalit
- izv. prof. dr. sc. Milna Tudor Kalit

Ocjenjivanje

Dovoljan (2): 60-70 %
Dobar (3): 71-80 %
Vrlo dobar (4): 81-90 %
Izvrstan (5): 91-100%

Vrsta predmeta

- Graduate studies / MS Courses taught in English (Izborni predmet, 2. semestar, 1. godina)

Opće kompetencije

The program of course Cheesmaking enables students to acquire the theoretical and practical knowledge necessary for: self-managing technological processes of cheese production in industrial conditions, setting up and implementing a quality control system for cheeses in order to produce a safe product and to protect consumers, waste management in cheese production and environmental protection; planning of cheese production in medium and large scale dairy plant.

Oblici nastave

- Lectures
  Lectures about cheesemaking history, cheese types and manufacturing procedure
- Auditory Exercises
  Exercises about calculations in cheesmaking and organisation of cheese production in dairy plant
- Laboratory practice/exercises
  Laboratory exercises about basic chemical analyses of cheese necessary for labeling
- Field work
  Field work in the dairy plant
- Seminars
  Seminars about world famous cheeses

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Ishodi učenja i način provjere

Ishod učenja	Način provjere
Count and present technological procedures in cheesemaking.	Written (Partial written test No 1) and oral exam
Identify control points and critical control points in cheesemaking from receiving the milk till the final product.	Written (Partial written test No 1) and oral exam
Making calculations and plans for cheesemaking in the dairy units for different capacities.	Written (Partial written test No 2) and oral exam
Determine indicators which influence the environment during building, reconstruction and equipping of the cheesemaking units (intensity and duration of some indicators) and form a conclusion about the programme for environmental protection.	Written (Partial written test No 2) and oral exam
Connect different aspects of cheesemaking.	Seminar and oral exam

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Način rada

Obveze nastavnika

Lectures
The lecturer of an individual unit should organize the lectures as a power point presentation with the time provided for interactive teaching. Lectures of teaching units that cover the subject should be organized according to the timeschedule and held within 15 weeks of direct teaching. All teaching materials that are not contained in the textbook are organized by teachers and according to teaching units available in the MOODLE system.

Seminars
Seminars are organized and conducted by a teacher on the subject in order to supplement and expand the knowledge of the cheesmaking. The topics of seminar papers must be given to the students at the beginning of the semester and provide them with 10 weeks of preparation. The teacher gives instructions on how to create seminar papers, approaches to scientific literature and databases, useful links, and helps students (provides guidance) during the seminar work. The teacher organizes oral presentation of the seminar papers, actively participates in the discussion together with other students. The overall quality of the seminar work (oral presentation and power point presentation) is evaluated by the teachers with the grade that participate in the final grade.

Auditing and field exercises
The subject teacher should organize the lectures from the auditing exercises as a power point presentation with the time provided for interactive teaching. Field exercises are organized by the subject teacher with the aim of presenting practical work in medium and large scale dairy plants.

Forum for communicating with students; a calendar of important events for the course; information related to the course; the instructions for writing the seminar work and results of written exams are available in the MOODLE system.

Obveze studenta

Attending lectures, exercises and seminars is mandatory. In cases of justified or unjustified absence from the lectures and/or exercises and/or seminars, students are obliged to enclose a report stating the reason of the absence, during the semester or within 4 weeks after the end of the semester. In case of the absence of more than 20%, students lose the right of signature, and the subject must be re-enrolled in the next academic year. The obligation of each student is to make a seminar paper and present the topic discussed in the power point presentation (in 10-15 minutes) after which other students and teacher have the right to ask questions. The written part of the exam that is organized within the regular examination period or during the semester students can take written part of exam as two partial written exams. Oral exam is organized during regular examination period.

Polaganje ispita

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Elementi praćenja	Maksimalno bodova ili udio u ocjeni	Bodovna skala ocjena	Ocjena	Broj sati izravne nastave	Ukupni broj sati rada prosječnog studenta	ECTS bodovi
Partial written exam No1	40	< 60 % 60-70 % 71-80 % 81-90 % 91-100 %	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	24	72	2.4
Partial written exam No2	40	< 60 % 60-70 % 71-80 % 81-90 % 91-100 %	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	24	72	2.4
Seminar	12	1/5 2/5 3/5 4/5 5/5	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	8	24	0.8
Oral exam	8	< 60 % 60-70 % 71-80 % 81-90 % 91-100 %	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	4	12	0.4
Total	100			60	180	6

Elementi praćenja	Opis	Rok	Nadoknada
Seminar	It is estimated whether a student’s seminar covered all default units as well as his/her mode of presentation (whether he/she read from the slides or how he/she prepared presentation).	The last week of course programme	In the examination period
Oral exam	Three questions to determine whether a student understands and connects the material.	The last week in semester	In the examination period

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Tjedni plan nastave

1. Definition of the cheese and cheese classification. History of cheesemaking (L)
2. Milk preparation for cheesemaking
3. Practical cheesemaking in the dairy – Part I
4. Practical cheesemaking in the dairy – Part II
5. Heat treatment of milk in cheesemaking
6. Cheesemaking fundamental technological procedures – Part I
7. Cheesemaking fundamental technological procedures – Part II
8. Calculation and standardisation for cheesemaking
9. Whey separation in cheesemaking
10. Acidification during cheesemaking
11. Determination of gross chemical composition of the cheese
12. Hygiene and sanitation, HACCP implementation in cheesery and environmental protection
13. Worldwide famous cheese – Part I
14. Worldwide famous cheese – Part II
15. Written and oral exams (S)

Obvezna literatura

1. Law B.A. (1999): Technology of cheesemaking. Sheffield Academic Press.
2. Eck, A. and Gillis, J.C. (2000): Cheesemaking from Science to Quality assurance. Second edition, Editions TEC and DOC, Londres, Paris, New York.
3. Kalit, S. (2016): Oxford Companion to Cheese. In press
4. Wendorf, L.W. and Kalit, S. (2016): Sheep Milk - Processing of Sheep Milk. In Handbook of Milk of Non-Bovine Mammals - Secon Editon, In press

Preporučena literatura

1. Magdić, V., Kalit, S., Mrkonjić Fuka, M., Skelin, A., Samaržija, D. (2013): A survey on hygienic and physicochemical properties of Istrian cheese. Mljekarstvo, 63 (2), 55-63.
2. Valkaj, K., Cerjak, M., Kalit, S., Rako, A., Wendorff, W.L. (2013): Do consumers from Međimurje region recognize their autochthonous Turoš cheese. Mljekarstvo, 63 (4), 211-219.
3. Tudor Kalit, M., Kalit, S., Delaš, I., Kelava, N., Karolyi, D., Kaić, D., Vrdoljak, M., Havranek, J. (2014): Changes in the composition and sensory properties of Croatian cheese in a lamb skin sack (Sir iz mišine) during ripening. International Journal of Dairy Technology, 67 (2), 255-264.
4. Matić, A., Kalit, S., Salajpal, K., Ivanković, S., Sarić, Z. (2014): Consumers' preferences and composition of Livanjski cheese in relation to its sensory characteristics. Mljekarstvo, 64 (3), 170-177.
5. Valkaj, K., Kalit, S., Salajpal, K., Zubović, M., Marković, T. (2014): Chemical and microbiological characterization of Turoš cheese. Agriculturae Conspectus Scientificus, 79 (3), 201-207.
6. Matić, A., Kalit, S., Salajpal, K., Ivanković, S., Sarić, Z. (2014): Consumers' preferences and composition of Livanjski cheese in relation to its sensory characteristics. Mljekarstvo, 64 (3), 170-177.

Sličan predmet na srodnim sveučilištima

- University of Wisconsin, Madison, Wisconsin Center for Dairy Research