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Course Unit	Milk Science		Field of study	Animal Science	
Master in	Technology and Animal Science		School	School of Agriculture	
Academic Year	2023/2024	Year of study	1	Level	2-1	ECTS credits	6.0
Type	Semestral	Semester	2	Code	5026-810-1202-00-23

| Workload (hours) | 162 | Contact hours | T | - | TP | - | PL | - | TC | - | S | - | E | - | OT | - | O | - |

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

| Name(s) of lecturer(s) | Álvaro Luís Pegado Lemos Mendonça |

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Learning about technologies for milk and milk products. Milk production, processing of several milk products. Quality control and food safety.
2. Small family business and large manufacturing industry. Food safety
3. Know the legislation related to the sector and know how to value your products. Production of various worldwide distribution cheeses

Prerequisites

Before the course unit the learner is expected to be able to:
1. Students must have knowledge on milk chemistry, microbiology and food technology.
2. Students must have a previous graduation.

Course contents

Production and consumption of milk and its derivatives in the world. Concept of integrated filière. New trends Milk composition and its importance. Milk secretion and quality control before milking. Determinism of the quality. Quality Control, from farm to fork. Dairy products. Products with Protected Designation of Origin (PDO). EU legislation. Sensory analysis. Technologies of milk processing. New trends

Course contents (extended version)

1. Milk and milk production in Portugal and in the world
2. Milk production in a continuous point of view.
3. Milk composition and importance of lipids, carbohidrates proteins and others
4. Milk production and quality
   - Factors resulting in quality losses before milking
   - Factors resulting in quality losses after milking
5. Milk processing technologies
6. Quality control until processing
   - physical, chemical and microbiological assessment
   - Results interpretation
   - Milk quality classification and prices.
7. Milk derivatives
   - Fresh milk. Pasterurized and UHT. Technology and quality control.
   - Cheese. ripenning. Technology and quality control.
   - Butter. Technology and quality control.
   - Proteins from whey. Technology and quality control.
   - Other produts from milk
8. Quality control, transport, distribution and food safety of all products.
9. Quality as result of all "filière"
10. Protected Denomination Origin, PDO
11. Legislation
12. Sensory analysis
13. New trends in food safety and technology
   - High pressure and filtration techniques
   - Food irradiation

Recommended reading

1. Ciencia de la leche: principios de técnica lechera- 2003 - Charles Alais, Antonio Lacasa Godina Acribia.
2. O Leite- 2009-FM Luquet, Vols 1-2-3-4. Europa América. From Milk By-products to Milk Ingredients: Upgrading the Cycle Hardcover –2014 - Ruud de Boer
3. -Global Cheesemaking Technology - Cheese Quality and Characteristics. Ed Photis Papademas & Thomas Bintsis ISBN 978-1-119-04615-8
4. Cheese: Chemistry, Physics and Microbiology: Volume 1 General Aspects by P. F. Fox -2012- P. F. Fox
5. Microbial Biotechnology: Principles and Applications –2006 Yuan-Kun Lee. Hardcover

Teaching and learning methods

Lectures will be supported by media and multimedia resources. Practical classes will engage direct work in lab. Everyone is expected to contribute actively to discussions. Non present hours will involve training in a working environment. Graduate students are expected to work largely on their own initiative although with the close support and supervision of a tutor.

Assessment methods

1. practical work and written tests - (Regular, Student Worker) (Final)
   - Practical Work - 40% (Evaluation of the quality of the practical work and its presentation)
   - Intermediate Written Test - 60% (and two written tests for evaluating knowledge)
2. final exam - (Regular, Student Worker) (Supplementary, Special)

Language of instruction

Portuguese

Electronic validation

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13-02-2024	13-02-2024	14-02-2024	17-02-2024