INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Option I - Technology of Table Olives, Olive Oil and other Vegetable Oils			Field of study	Food Industries		
Bachelor in	Agronomic Engineering			School	School of Agriculture		
Academic Year	2022/2023	Year of study	3	Level	1-3	ECTS credits	6.0
Type	Semestral	Semester	1	Code	9086-307-3104-01-22		

Workload (hours)	162	Contact hours	T	TP	PL	TC	S	E	OT	O
			30	-	30	-	-	-	20	-

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): José Alberto Cardoso Pereira, Maria Fátima Alves Pinto Lopes da Silva, Nuno Miguel Sousa Rodrigues

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Understand the process of oil biosynthesis in fruits and seeds
2. Know the technological processes of olive oil, vegetable oils and table olives production and be able to intervene on their improvement
3. Know the chemical composition of vegetable oils and the factors affecting it
4. Implement protocols for quality control and authenticity of vegetable oils and table olives

Prerequisites

Before the course unit the learner is expected to be able to:
Students should have basic knowledge about chemistry, biochemistry and microbiology.

Course contents

Production of fruits and seed for oil extraction. Lipids biosynthesis. Harvest and preservation of raw materials and their influence on quality. Technology of seed oils. Technology of olive oil. Chemistry of vegetable oils and factors that affecting it. Storage and preservation of vegetable oils. Packaging. Quality of vegetable oils and legislation. Authenticity of olive oil and vegetable oils. Technology of table olives.

Course contents (extended version)

1. Formation of the fruit, seed and oil synthesis
   - Origin, structure and development of the cellular membrane
   - Formation and biosynthesis of the lipids in the cells
   - The oil in the fruit and in the seed
2. Harvest and preservation of the raw material
   - Harvest processes
   - Preservation processes and their influence on in the quality
3. Technological process of seed oils
   - The different processing operations
   - The extraction process
   - The effect of the technological operations in the oils composition
4. Technological process of olive oil
   - The milling operation
   - The malaxation operation
   - The olive oil extraction: pressing, centrifugation, percolation or selective filtration
5. Vegetable oils composition and factors that influence it
   - Saponifiable fraction: fatty acids composition; triglycerides
   - Others components of the saponifiable fraction: fosfatids; chlorophylls
   - Unsaponifiable fraction
   - Hydrocarbons
   - Substances of terpenic and sterolic nature: eritrodiol and uvaol; sterols
   - Carotenoids
   - Tocopherols
   - Waxes
   - Phenolic compounds
   - Volatile compounds
6. Storage and preservation of vegetable oils
7. Package
8. Vegetable oils quality
   - Sensorial evaluation
   - Hydrolysis and acidity: hydrolytic rancidity
   - Oxidation and oxidative stability: auto-oxidation; photooxidation
   - Glycerides and fatty acids
   - Sterols
   - Waxes
   - Color
9. Legislation and quality
10. The authenticity of olive oil and vegetable oils
    - Olive oil adulteration due to mixture with different categories of olive oils
    - Olive oil adulteration due to mixture with different kinds of vegetable oils
    - Authenticity confirmation and adulteration detection through the chemical composition
    - Chemiometric methods of results analysis
    - New methods of authenticity verification
    - Analysis of stable isotopes
11. Technology in the table olives production
    - Classification of the different kinds
    - Processing methodology
    - Quality control

Recommended reading

1. Kiritsakis, A. K. , 1998. Olive Oil from the tree to the table. Second Edition, Food & Nutrition Press, Inc. USA.
2. Fernández, A. F. ; Díez, M. J. F. & Adams, M. R. , 1997. Table olives, production and processing. Chapman & Hall, U. K.
3. Hermoso, M. ; Uceda, M. ; García-Ortiz, A. ; Morales, J. ; Frias, L. & Fernández, A. , 1991. Elaboration de ceite de oliva de calidad. Junta de Andalucia, Consejería de Agricultura y Pescas.
4. Pereira, J. A. , 2000. Controlo de Qualidade de Azeites e Parâmetros de Autenticidade. Faculdade de Farmácia da Universidade do Porto.

Recommended reading

5. Regulamento CEE nº2568/91 da Comissão de 11 de Junho de 1991 e posteriores alterações

Teaching and learning methods

Lessons: theoretical, practical and laboratorial lessons of the themes to be developed in the Course Unit. Visit processing units of olive oil and table olives. No presence hours: hours of study. Search of literature for preparing reports of practical works, discussion of results and preparation of seminar discussion.

Assessment methods

1. Alternative 1 - (Regular) (Final, Supplementary, Special)
   - Practical Work - 50%
   - Final Written Exam - 50%
2. Alternative 2 - (Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100%

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

José Alberto Cardoso Pereira	Maria Fátima Alves Pinto Lopes da Silva	Albino António Bento	José Carlos Batista Couto Barbosa
15-12-2022	15-12-2022	20-12-2022	20-12-2022