

30832 - Vegetable Product Technology

Syllabus Information

Academic year: 2023/24

Subject: 30832 - Vegetable Product Technology

Faculty / School: 105 - Facultad de Veterinaria

Degree: 568 - Degree in Food Science and Technology

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The general objective of this subject is that the student deepens and specializes in a sector of great importance in the Aragonese and Spanish food industry such as food of vegetable origin and its derivatives. Aspects to be addressed include the use of clean technologies for decontamination, post-harvest preservation, marketing and design of new products in line with current consumer demands, focusing on fresh fruits and vegetables, cereals, pulses and oilseeds.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), so that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to the achievement of Objective 9.4 of Goal 9 (Industry, innovation and infrastructure) and Objectives 12.3, 12.4 and 12.5 of Goal 12 (Responsible production and consumption).

2. Learning results

- Apply the scientific fundamentals of plant chemistry, biochemistry and physiology to understand and control the changes that occur in plant products after harvesting.
- Use different equipment, instruments and analytical techniques to determine the maturity and quality of fruits and vegetables.
- Apply the necessary prevention and control measures to minimize the pathological and physiological alterations that affect fruit and vegetable products.
- Design post-harvest treatments and strategies to extend shelf life without loss of quality, selecting the most suitable preservation methods for the different fruit and vegetable products (temperature, relative humidity, gas composition).
- Understand the fundamentals of upstream operations and basic processes in the industrial processing of fruits and vegetables.
- Know the main equipment and processes for the industrial transformation of fruits and vegetables into IV and V Range products, preserves, dehydrated products, frozen products, jams and juices.
- Know the main equipment and processes for the processing of legumes and fermented products.
- Design the flow chart for the transformation and processing of raw materials of vegetable origin into products of quality and added value.
- Identify and control the processing factors that can modify the quality of the final products.
- Understand the use that can be made of the main by-products generated in the processing industry of raw materials of vegetable origin.

3. Syllabus

BLOCK I: POST-HARVEST TECHNOLOGIES

Topic 1. Introduction and economic importance of plant foods.

Topic 2. Structure of plant products.

Topic 3. Chemical composition of fruits and vegetables.

Topic 4. Postharvest metabolism of fruits and vegetables.

Topic 5. Operations prior to postharvest preservation.

- Topic 6. Cold storage.
- Topic 7. Modified and controlled atmospheres.
- Topic 8. Ethylene management in postharvest preservation.
- Topic 9. Postharvest alterations of fruits and vegetables.
- Topic 10. IV, V range products and new developments.

BLOCK II: INDUSTRIALIZATION OF PLANT PRODUCTS

- Topic 11. The operations common to the different processes of transformation of vegetable products.
- Topic 12. Heat preservation of fruits and vegetables.
- Topic 13. Dehydration of fruits and vegetables.
- Topic 14. Freezing of fruits and vegetables.
- Topic 15. Fermentation of vegetable products.
- Topic 16. Technology for the production of jams and jellies.
- Topic 17. Fruit and vegetable juice processing technology.
- Topic 18. Legumes.
- Topic 19. Cereals and derivatives, oils and sugar.

4. Academic activities

Master classes: 45 hours. Sessions with the teacher in which the subject syllabus will be explained.

Laboratory practices: 12 hours. Four 3-hour sessions will be held. Session 1: Pigments in fruits and vegetables. Session 2: Determination of respiration rate of different fruits and vegetables: influence of species and temperature. Ripening indexes. Session 3: Manufacture of fresh-cut and pre-prepared convenience food products. Session 4: Processing of dehydrated vegetable products.

Visit to a company in the sector: 3 hours.

Study and independent work: 90 hours.

5. Assessment system

Continuous Assessment

1. Evaluation of theoretical teaching:

BLOCK I: Written test consisting of 20 multiple-choice questions with four possible answers and only one correct answer, where incorrect answers will be penalized (-0.25) and between 5 and 7 short questions.

BLOCK II: Written test consisting of 50 multiple-choice questions with four possible answers and only one correct answer, incorrect answers will be penalized (-0.25).

The grade obtained (70% of the final) will be maintained in the second call of the subject as long as it exceeds 5 out of 10

2. Practical teaching evaluation and visit:

An online self-evaluation exercise will be carried out on the same day as each practice. In addition, the student will choose one of the practices to prepare a report. This report should include the methodology and the main results and conclusions obtained, as well as the problems, questions and debates that have arisen in the same.

Associated with the visit, a report will be made consisting of answering some questions provided by the teacher beforehand.

The grade for these activities as a whole will represent 30% of the final grade (0-10) of the subject and will be maintained in the second call as long as it exceeds a grade of 5 out of 10

Global Assessment

There will be a global test for those students who do not follow the continuous evaluation system, who have not passed any of the continuous evaluation tests or who are not satisfied with the grade of the continuous evaluation

The overall evaluation will include two tests: The first test on theoretical teaching (70% of the final grade) will include a multiple choice test, subtracting the incorrect questions, and a test with open questions. The second theoretical-practical test will include open questions and will represent 30% of the final grade. The degree of knowledge, the adequacy of the answer to the

question, the coherence of the reasoning and the explanatory capacity will be evaluated.