Universidad Zaragoza

Academic Year/course: 2022/23

30838 - Enrichment in the Drinks Sector

Syllabus Information

Academic Year: 2022/23
Subject: 30838 - Enrichment in the Drinks Sector
Faculty / School: 105 - Facultad de Veterinaria
Degree: 568 - Degree in Food Science and Technology
ECTS: 5.0
Year: 4
Semester: Second semester
Subject Type: Optional
Module:

1. General information

1.1. Aims of the course

The course and its expected results address the following approaches and objectives:

The degree aims to make qualified technicians available to the agri-food industry for the management of both the quality control and production departments. The discipline of Intensification in the fruit and vegetable sector is part of the Integration Module, very important in the training of the future graduate, since it integrates all the knowledge that the students have acquired in all of the previous modules.

Consequently, the general objective of this course is for the student to deepen and specialize in a sector of great importance in the Aragonese and Spanish food industry, such as the fruit, vegetable and derivatives sectors. For this, they will be trained in aspects of technology, quality and safety, marketing and the environment.

These approaches and objectives are aligned with the following sustainable development goals (SDG) of the United Nations 2030 Agenda, in such a way that the acquisition of learning outcomes of the subject provides training and skills to contribute to a certain extent to its achievement:

-Goal 1: End of Poverty

- Goal 2: Zero Hunger

- Goal 3: Health and Well-being

- Goal 6: Clean water and sanitation

- Goal 9: Industry, Innovation and Infrastructure

- Goal 12: Responsible production and consumption

- Goal 13: Climate Action

1.2. Context and importance of this course in the degree

Overcoming this discipline will enable students to pass the Integration Module located in the eighth semester and the achievement of the title of Graduate in Food Science and Technology. In this module, a practicum will be carried out, external internships will be carried out and an end-of-degree project will be prepared and defended, for which the knowledge and skills acquired in this subject are fundamental.

1.3. Recommendations to take this course

In general, it is considered important to have completed all the subjects of the first three years, as well as the first semester of the fourth year. In particular, it is considered essential that students have taken the subject of Plant Products Technology in the first semester of the fourth year.

2. Learning goals

2.1. Competences

Upon passing the subject, the student will be more competent to...

CE1 - Define the elements of a strategic plan and a quality management and control system and plan its implementation in the food industry, including purchasing policies and cost calculation.

CE2 - Perform physical, chemical, microbiological and sensory analyzes of raw materials and food and interpret the results obtained.

CE3 - Identify the physical, chemical and microbiological agents that cause food spoilage and select the most appropriate strategies for their prevention and control.

CE4 - Identify and assess the physical-chemical, sensory and nutritional characteristics of foods, their influence on processing and the quality of the final product.

CE5 - Prepare, transform and preserve food considering quality and safety standards, integrating environmental management.

CE9 - Formulate new foods choosing the most appropriate ingredients and additives as well as the treatments to obtain safe, nutritious and attractive products for the consumer.

CE10 - Design and validate new manufacturing processes to meet market needs and demands.

CE12 - Provide scientific and technical advice to the food industry.

CE13 - Communicate knowledge in food science and technology, using the fundamental concepts, methods and tools of this discipline.Además se fortalecerán diversas competencias básicas y generales como:

CG1 - Manage information, search for sources, collection and analysis of information, etc.

CG2 - Use ICTs

CG3 - Teamwork

CG4 - Think and reason critically.

CG5 - Work autonomously and carry out a self-assessment.

CG6 - Respect the diversity and plurality of ideas, people and situations.

CG7 - Transmit information, orally and in writing, both in Spanish and in English

CG8 - Show environmental sensitivity, assuming an ethical commitment.

CG9 - Negotiate both with specialists in the area and with people who are not experts in the field.

CG10 - Adapt to new situations and solve problems.

CG11 - Undertake and be motivated by quality.

CB1 - That students have demonstrated to possess and understand knowledge in an area of ??study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects involving knowledge from the forefront of their field of study

CB2 - That students know how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of ??study

CB3 - That students have the ability to gather and interpret relevant data (normally within their area of ??study) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature

CB4 - That students can transmit information, ideas, problems and solutions to both a specialized and non-specialized audience

CB5 - That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy

2.2. Learning goals

To pass this subject, the student must demonstrate that...

1. Knows the sociocultural factors that determine the technical evolution of the production, transformation, and consumption of fruits and vegetables.

2. Master the post-harvest technologies of the main fruits and vegetables by groups: their maturity and quality indices, conservation conditions and techniques, and the physiopathies and pathologies that most frequently affect each of the groups.

3. Is capable of designing the flow diagram for handling, conservation, marketing and transformation into minimally processed products of the main groups of fruit and vegetables.

4. Is able to explain and apply the concepts of food safety, quality and legal regulations to the fruit and vegetable production, processing and marketing sectors.

5. Identifies the contaminants that are generated in the different processes studied.

6. Knows the proper management of the waste generated in the different processes studied.

7. Knows and knows how to explain what has been the evolution of the area, production, value of production and consumption of fruit and vegetables in Spain.

8. Identify the different agents in the distribution chain and the different types of chains.

9. Knows and knows how to interpret the context of the European market and the main flows of Spanish foreign trade that define Spain's competitive position at European and world level.

2.3. Importance of learning goals

Together with the rest of the skills acquired in the subjects of the Integration Module, they contribute to the training of students for the performance of all the professional profiles that students can exercise in industries, such as laboratories, consultancies, etc.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate the achievement of the expected learning outcomes through the following assessment activities

A) Continuous evaluation

1) Evaluation of theoretical teaching: Written test that will consist of test questions and/or short questions and will be carried out at the end of each of the blocks into which the program has been divided. It will mean 40% of the final grade (from 0 to 10) of the subject. Passing this test will partially accredit the achievement of learning outcomes 1 to 8.

2) Evaluation of practices and visits: The results obtained in each work group of practices will be presented to the whole group in the last session. This presentation will collect the methodology followed, the results and the conclusions obtained, as well as the problems, questions and debates that may have arisen during them. Also, a report will be made for each of the visits carried out where the key aspects discussed are collected. Personal contributions on each topic will be valued, as well as current comments related to them. It will mean 40% of the final grade (from 0 to 10) of the subject.

3) Evaluation of supervised work. It will consist of the presentation, defense and critical evaluation of a research paper in English on conservation and disinfection technologies for fruit and vegetable products. It will mean 20% of the final grade (from 0 to 10) of the subject. Passing this test will partially accredit the achievement of learning outcomes 1 to 8.

Attendance and participation in all scheduled activities is mandatory to qualify for the continuous assessment modality.

B) Overall test

For students who do not pass or do not take the continuous evaluation, a global evaluation test will be carried out.

The global evaluation written test will consist of 20 short questions corresponding to the theoretical and practical teaching and the visits made. Passing this test will accredit the achievement of all learning outcomes. The grade obtained will represent 100% of the final grade.

Evaluation criteria

Evaluation criteria and levels of demand

In all tests, a minimum grade of 4 out of 10 must be obtained, and the weighted average of tests must be equal to or greater than 5.

Clarity and conciseness in the answers to the short questions in the evaluation of theoretical teaching will be valued. In the evaluation of the practices, the adequacy of the selected conservation system to the product, the analyzes carried out in the laboratory with regard to the adequacy of the selected analysis methods, the preparation of the material and the handling of analytical techniques will be assessed. In the practice reports, the approach followed for the development of the practice, the clarity in the presentation and in the interpretation of the results (graphs, tables, statistical analysis) will be valued. The quality of the bibliographic sources consulted, essential to compare and analyze the results obtained and to design the applied treatments, will also be assessed.

In the evaluation of the supervised work, the presentation made will be valued in terms of order, clarity and adequate presentation of the results and conclusions, as well as the mastery of the assigned topic.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology to be followed in this subject is aimed at achieving the learning objectives. To this end, student participation will be encouraged, favoring discussion and decision-making. For this purpose, various teaching and learning strategies will be used during the participatory master classes, the laboratory and pilot plant practices, the supervised work and the visits.

All the materials and resources used in teaching will be available in the Digital Teaching Ring that the University of Zaragoza makes available to students and teachers (http://add.unizar.es).

During the development of classes, students will have to take into account all the procedures and regulations that are included in the following documents:

- "Preventive Guide for Students of the University of Zaragoza", which is available at the following address: https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/guia_preventiva_para_estudiantes.pdf
- Safety manual in the laboratories of the University of Zaragoza and standards set by the Occupational Risk Prevention Unit:

https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/manual de seguridad en los laboratorios (

https://uprl.unizar.es/inicio/manual-de-procedimientos

In addition, the indications given in terms of safety by the teacher responsible for the classes will be followed

4.2. Learning tasks

The subject has 5 ECTS organized in:

Participatory master classes (2.0 ECTS): 20 hours

Laboratory practices and pilot plant (1.5 ECTS): 15 hours

Visits (1 ECTS): 10 hours

Supervised work (0.5 ECTS): 5 hours

- Lectures: the teacher will explain the theoretical contents of the course and will solve the applied problems through the use of graphic material. Although not a required activity, regular attendance is highly recommended.
- Laboratory sessions and pilot plant: 5 sessions of 3 hours duration will be held. In these five sessions the students will apply different conservation and disinfection techniques for fruit and vegetable products. In groups of 3-4 people, they must choose the treatment to be applied, design it, apply it and assess the benefits that its application entails on the shelf life and the physical-chemical and organoleptic quality of the fruit and vegetable product. In the last session there will be a presentation where each working group will present the results obtained with the help of graphic material and will discuss the suitability of the applied technology.
- Visits: depending on the destination, 2 or 3 visits will be made to companies or technology centers related to the fruit and vegetable sector. These visits will focus on the challenges and opportunities facing the Spanish fruit and vegetable sector both in cultivation and marketing.
- Tutored work: it will consist of the analysis of a research work in English in terms of its working hypothesis, applied methodology and results and conclusions obtained. On the last day of the course, each student will make a presentation where she will present the aforementioned aspects that will be debated with the responsible teacher and the rest of the students.
- Autonomous work: 75 hours to study the concepts covered in the lectures, prepare laboratory sessions, prepare the tutored work and take exams.
- Tutorials: the teacher's tutorial hours will be published on Moodle and the degree website to help students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

4.3. Syllabus

A) THEORETICAL SESSIONS

BLOCK I - POST-HARVEST TECHNOLOGIES BY PRODUCT GROUPS (1 ECTS, 10 teaching hours)

1.- Pome fruits

2.- Stone fruits

3.- Small fruits

4.- Citrus fruits

5.- Fruit vegetables

6.- Stem, leaf and flower vegetables

7.- Flowers, buds, and herbs

8.- Hypogean vegetables and truffles

BLOCK II - SAFETY MANAGEMENT IN THE FRUIT AND VEGETABLE SECTOR (0.5 ECTS, 5 teaching hours)

1.- Biotic risks in fruit and vegetable products

2.- Low-impact decontamination treatments versus traditional treatments

3.- Post-harvest treatments for insect control and quarantine protocols

4.- Food safety protocols: BRC, IFS...

BLOCK III- THE FRUIT AND VEGETABLE SECTOR AND THE ENVIRONMENT (0.25 ECTS, 2.5 teaching hours)

1.- Types of contaminants generated in the production, conservation and transformation of fruits and vegetables.

2.- Techniques to reduce contamination in the production, conservation and commercialization of fruits and vegetables. Zero waste: towards sustainable production.

3.- Complete life cycle management: carbon footprint, efficient water management, etc. Packaging recycling. New methods

of wastewater treatment.

BLOCK IV- ECONOMIC MAGNITUDES IN THE FRUITS AND VEGETABLES SECTOR (0.25 ECTS, 2.5 teaching hours)

1.- Market structure (production, consumption and market at a regional, national and international level). Common Market Organization (CMO).

2.- Distribution channels. Imports and exports.

B) PRACTICAL ACTIVITIES: 25 teaching hours

B.I.) Laboratory and pilot plant practical sessions: 15 teaching hours

B.II) Visits: 10 teaching hours

B.I) PRACTICAL SESSIONS:

In these five 3-hour sessions, students will apply different conservation and disinfection techniques for fruit and vegetable products. In groups of 3-4 people, they must choose the treatment to be applied, design it, apply it and assess the benefits that its application entails on the shelf life and the physical-chemical and organoleptic quality of the fruit and vegetable product. The last session will be devoted to sharing the results obtained.

B.II) VISITS

Visits will be made to companies and technology centers in the fruit and vegetable sector with the aim of knowing in situ the processes that are carried out there and sharing with experts and businessmen the challenges and opportunities that this sector faces.

C) GUIDED WORK (0.5 ECTS, 5 teaching hours)

At the beginning of the course, each student will be assigned a scientific research paper in English. This work must be analyzed in terms of its working hypothesis, applied methodology and results and conclusions obtained. The last day of the subject will proceed to the exhibition of the works in a joint session.

4.4. Course planning and calendar

The dates and key milestones of the subject are described in detail, together with those of the rest of the fourth-year subjects of the Degree in Food Science and Technology, on the website of the Faculty of Veterinary Medicine (link: http://veterinaria .unizar.es/gradocta/). This link will be updated at the beginning of each academic year.

4.5. Bibliography and recommended resources

The bibliography for the current academic year is kept up-to-date and can be consulted on the Library's website (look for recommended bibliography at library.unizar.es).