

26232 - Vegetable Product Technology

Información del Plan Docente

Academic Year	2016/17
Academic center	105 - Facultad de Veterinaria
Degree	294 - Degree in Food Science and Technology
ECTS	6.0
Course	4
Period	First semester
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The course is structured in 45 participatory lectures and 15 hours of practical activities and seminars. Regarding participatory lectures, it is scheduled for delivery in advance the documentation for each subject so that the student's review in detail before the corresponding class. In addition, students will find in the ADD presentations classes, protocols practices, additional supporting material, a discussion forum and a section of "news" related to the horticultural sector and the processing industries plant products. The practice sessions will take place in about 4 hours and include a visit to a fruit and vegetable products company, similar to each of the groups of practical features.

26232 - Vegetable Product Technology

5.2.Learning activities

The program that the student is offered to help you achieve the expected results includes the following activities ...

* Theoretical sessions

- Teaching unit I: 13 teaching hours

1. Introduction (1 hour lectiva)

Objectives, teaching methodology, program activities, evaluation and bibliography. economic and nutritional importance of plant foods in the world, European and Spanish context.

Item 2. Structure of plant devices (2 hours)

cell, tissue and organ structure. Implications for conservation postharvest of different products.

Item 3. Chemical composition of fruits and vegetables (3 hours)

General features. Water, carbohydrates, organic acids, amino acids and proteins, lipids, phenolic compounds, pigments, volatiles, vitamins, minerals and enzymes. Importance and factors on which they depend.

Item 4. Metabolism post-harvest fruit and vegetables (4 hours).

Dark respiration. Regulation of aerobic respiration: biochemical aspects. Influence of temperature and composition of the atmosphere in respiratory activity. The influence of ethylene. Anaerobic respiration. postharvest breath as an index of general metabolic activity and as a predictor of the life, the influence of the degree of ripening, the temperature response to the oxygen concentration, carbon dioxide and ethylene. Organoleptic maturation of fruits and vegetables: changes involved and responsible agents. The response to ethylene climacteric fruits and non-climacteric. The role of ethylene in the ripening of fruits and vegetables. Ethylene synthesis and regulation.

Item 5. Pre postharvest (3 hours) conservation operations.

Determination of maturity. Collection systems. Transfer of commodities between different areas of the factory. Dry cleaning. Washed. Inspections and ratings for manual and automatic systems. Making.

- Teaching Unit II: 12 teaching hours

Item 6. The cold storage (2 hours of teaching)

The importance of early and deep cooling. Precooling systems in fruits and vegetables. The limits of cooling: cold injury and physiological disorders. Recommended temperatures for different fruits and vegetables. Control of ethylene in cold storage.

Item 7. The modified and controlled atmospheres (3 hours)

The beneficial and harmful effects. Recommended concentrations for various fruits and vegetables. Controlled atmosphere: types, control systems,

Item 8. Management ethylene in the postharvest conservation (1 hour lectiva)

Ethylene removal systems. Inhibitors ethylene production. Ethylene management in the controlled maturation and desverdización.

Item 9. post-harvest fruits and vegetables Alterations (4 teaching hours)

Definition and importance in the post-harvest. Mechanical damage. pathological changes: the microorganisms responsible, the infection process, pre- and post-harvest factors influencing incidence, most common post-harvest rots, methods of prevention and control of rots. physiological alterations: injuries nutritional deficiencies and injuries unsuitable weather conditions. Identifying lesions.

Item 10. The minimally processed objects (2 hours)

Definition. Types of products. Problems in processing. Process development and conservation. Useful life. sanitary quality. Fifth plant products range: Definition. Systems development and conservation. emerging technologies applied to conservation. Useful life. sanitary quality.

- Teaching Unit III: 9 hours of class

Item 11. Common to the various processes of transformation of plant devices (2 hours) operations

Selection of raw materials. Separating inedible portions. Bare. I chopped. Scalding. Principles, systems and equipment used.

Item 12. The heat preservation of fruits and vegetables (3 hours)

Objectives and basic principles. Heat treatment and preliminary and complementary operations. Facilities and operation. Aseptic packaging systems and new heat treatment plant products. Canned fruits and vegetables.

Item 13. The dehydration of fruits and vegetables (2 hours).

Goals. Basic principles. Preliminary operations. Driers for different types of plant products. complementary operations. Technology manufacturing dehydrated products: dehydrated vegetables, dried fruits, fruit juices.

Item 14. Freezing fruits and vegetables (2 hours)

Basic principles. Preliminary operations. Facilities for freezing fruits and vegetables. complementary operations. Effects on fruits and vegetables.

- Teaching Unit IV: 11 teaching hours

26232 - Vegetable Product Technology

Item 15. The fermentation of plant products (1 hour lectiva).

Objectives and basic principles. Technology development of acidic cabbage, pickles and table olives. Other products. Other methods of chemical conservation.

Item 16. Technology making jams and jellies (2 hours of teaching)

Classification and statutory rates. Formulations. Selecting pectins and sugars. Cooking and packaging. Candied and candied fruits: technology processing.

Item 17. Technology development of fruit and vegetable juices (4 hours)

Objectives and basic principles. Classification and types of juices. Preliminary operations. Extraction processes. Concentration of fruit juices. Deaeration. Conservation. Other non-alcoholic fruit drinks.

Item 18. Pulses (2 hours of teaching).

Production and classification. Chemical composition. anti-nutritional factors. Drying and storage of seeds. Obtaining flours, concentrates and soy protein isolates. Other products derived from soybeans. germinated legumes. Fermented vegetables. Obtaining proteins and starches.

Item 19. Cereals and derivatives, oils and sugar (2 hours). Introduction to processing technology.

* Practical sessions (practical sessions are approximately four hours)

Practice 1. Determination of the respiration rate of different fruits and vegetables: influence of the species and temperature

Determination of the oxygen content and carbon dioxide and ethylene in the headspace of vessels containing different types of fruit.

Reckon oxygen consumption and carbon dioxide production per kilogram and ethylene and time.

-Classification Of different species of fruits and vegetables based on their respiratory activity

Practice 2. Determination of degrees of maturity in fruit and vegetables

- Determination of color: color charts and instrumental measurement

- Instrumental texture measurement by hand penetrometer

- Determination of pH and acidity by titration with sodium hydroxide

- Determination of soluble solids by refractometry

- Determination of starch content

- Determine the level of maturity in terms of results and specialized literature

Practice 3. Development of minimally processed products and fifth range

- Development of minimally processed apple

- Production of chard in fifth range

- Sensory evaluation of both products

Practice 4. hortofrutícola Central

- Visit the farm plot and the company

- Briefing on the work Technologist Postcosecha in hortofrutícolas

Detailed description of the operation of the company and of the processes developed in it in the script of practices.

* Seminars (of a duration of 1 hour)

Seminar 1: Diagnosis of pathological changes. Practical cases.

Seminar 2: Tropical fruits: identification and post-harvest technology.

5.3.Program

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26232 - Vegetable Product Technology

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26232 - Vegetable Product Technology

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5.4.Planning and scheduling

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

5.5.Bibliography and recommended resources

<http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=26232&Identificador=12151>