

## 30809 - Production of raw materials in the food industry

### Información del Plan Docente

Academic Year	2016/17
Academic center	105 - Facultad de Veterinaria
Degree	568 - Degree in Food Science and Technology
ECTS	6.0
Course	1
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 learning process designed for this subject is based on ....

The subject is structured in 46 of lecture sessions, of 1 hour each, and 8 hours of practical activities at laboratory or classroom and 6 hours of seminars.

## 30809 - Production of raw materials in the food industry

The program of the lecture sessions is organized in two thematic blocks; Production of raw materials from vegetal origin and Production of raw materials of animal origin with 23 hours per block. The documentation of each lesson will be provided to students by the University virtual campus (ADD). It includes the development of the theoretical concepts, numeral examples, demonstrative graphics and illustrative images. At discretion of the teacher, a list with some questions about each lesson could be given to student self-evaluation.

The practical activities at laboratory will involve the knowledge of the lab analytical basic technics.

The practical activities at classroom will include graphic material to make easier the learning of the theoretical concepts.

The seminars will consist in preparing and presenting orally a monographic work. For that, a list of (illustrative) interesting topics will be suggested according to the development of the subject.

### 5.2.Learning activities

#### SECTION A - Production of raw materials of animal origin

These activities involve 3 ECTS and include the following:

- Lecture sessions: 23 hours. Descriptor contents will be worked and participation in class will be promoted by proposals of opinion/discussion topics.
- Practical activities: 4 hours. One practice (2 h) will consist in presenting a work, in groups of 2-3 students for 15-20 min, about interesting aspects of animal production. The attendance of the rest of students will be obligatory. Other practice (2 h) will be a visit in the experimental facilities of the Veterinary Faculty Campus which will permit an approximation to the management of a commercial farm.
- Seminars: 3 hours. They will consist in that the teacher will present graphic material to make easier the understanding of the concepts.
- Private study, self-work: 43.5 hours. It includes the attendance to individual tutorials, especially those students who will present the seminar.
- Assessment: 1.5 hours.

#### SECTION B - Production of raw materials of vegetal origin

These activities involve 3 ECTS and include the following:

- Lecture sessions: 23 hours. Descriptor contents will be worked and participation in class will be promoted by proposals of opinion/discussion topics.
- Laboratory sessions: 4 hours. The laboratory work is aimed to provide students with an introduction to the main procedures and the interpretation of the results of analyses of plant and/or soil material.

## 30809 - Production of raw materials in the food industry

- Interactive group activities: 3 hours. They will consist in presenting and discussing individual works about interesting aspects of plant production.

- Private study, self-work: 43.5 hours. It includes the time dedicated to producing the individual works and attending to individual tutorials concerning them.

- Assessment: 1.5 hours.

### 5.3.Program

The program provided to the student to help achieving the planned results involves the following activities:

#### SECTION A - Production of raw materials of animal origin

##### Descriptors:

##### Lesson 1: Swine production

Peculiarities of the swine production. Census and productions. Swine genetic. Management of the reproduction (sows). Lactation of piglets. Management of the weaning. Management of the growing pigs under intensive conditions. Production of the Iberian pig. Carcass and meat quality.

##### Lesson 2: Laying hens

Peculiarities of the egg lay. Census and productions. Physiology of the laying hens. Management and facilities. Egg composition. Alterations. Effect of production factors on egg quality. Production of eggs to egg-derived.

##### Lesson 3: Chicken

Census and productions. Cycle and production system. Environmental conditions. Alternative production systems. Carcass quality and factors affecting. Meat quality and factors affecting.

##### Lesson 4: Physiology of ruminants

Anatomical peculiarities in ruminants. Microbial population in the rumen. Ruminal fermentation processes. Absorption and utilization of fermentation products.

##### Lesson 5: Milk production

Systems and factors of production. Lactation physiology. The mammary gland. Milk secretion. Lactation curve. Factors affecting milk production. Composition and origin of the milk compounds.

## 30809 - Production of raw materials in the food industry

### Lesson 6: Beef production

Production systems of cattle. Growing and development in cattle. Cattle genetic. Feeding and management. Cattle outdoor production. Carcass quality. Beef quality. Quality marks.

### Lesson 7: Ovine production

Census and distribution. Peculiarities of ovine. Sheep breeds. Reproduction and feeding. Production systems. Milk production in sheep. Meat production in lambs. Commercial types.

### Competences:

General concepts of animal production are given to the student, including the animal management and the peculiarities of the production systems. In addition, aspects of growing and developing physiology are provided and also aspects of reproductive physiology which will be adapted for every specie in subsequent thematic blocks. Concepts of carcass and meat quality are included and factors affecting them are revised. Student has to get the ability to make relationships among the specific characteristics of a product, the type of animal and the concrete production conditions. Also, student has to get critical sense to make opinions about the advantages and handicaps of the different production systems and the reason to choose one or other in function of the desirable product. The critical sense of the student will be promoted by the proposal of reading of currently papers and of presentation of interesting seminars related to subject.

## SECTION B - Production of raw materials of vegetal origin

### Descriptors:

#### Lesson 1: Food and vegetable production

Centers crops origin. The emergence of scientific research. The problem of food shortage: The theory of Malthus. Liebig and soil productivity. Factors that limit food production.

#### Lesson 2: Factors affecting the natural environment plant production: soil

Soil formation and evolution. Soil constituents: mineral matter, organic matter, water, air. Physical and chemical properties and its influence on the development of vegetation. most important sources of nutrients for plants and root absorption ionic form. Influence of pH in nutrient availability. Accommodating crops to soil reaction

#### Lesson 3: Mineral nutrients as factors of plant growth

Nitrogen. Match. Sulfur. Potassium. Calcium. Magnesium. Micronutrients. Deficiency and toxicity problems in plant nutrition.

#### Lesson 4: Influence of climatic factors on plant production

## 30809 - Production of raw materials in the food industry

Bioclimatology, agroclimatología, local weather, microclimate. Temperature. Precipitation. Atmospheric moisture. The light. Wind. agroclimatic classification. Climatic requirements of crops.

### Lesson 5: Cropping systems

extensive and intensive crops. Sustainable agriculture. Ecological agriculture. Tilling. Rotations and alternatives

### Lesson 6: Production Techniques

Irrigated and Dry-Farming. Use of plastics in agriculture. Soilless culture.

### Lesson 7: Crop Production

Fertilizers and fertilization. Plant Protection. Integrated disease and pest management. Bioestimulantes and manipulation of cultures.

### Lesson 8: Biotechnology and Plant Genetics

Biotechnology. Transgenic crops.

### Lesson 9: The cultivated plants and botanical classification

Basics of cytology, histology and organography. Constituents of the plant cell. Plant tissues: classification and characterization. Vegetative organs: root, stem, buds, leaves. Reproductive organs: flower, fruit, seed. Systematic scheme of categories and major groups of plant species. Outline of the main families of interest in food production.

### Lesson 10: Characteristics of large groups of food crops

Cereals. Legume. horticultural and fruit crops. The vine. The olive

### **Competences :**

It aims to present students the importance of plant production as the basis of food and raw materials in the food industry, the factors of the environment (soil and climate) that enable or hinder the production and quality of plant foods, role of nutrients in plant development, and systems and most important techniques in crop production as well as the contributions of biotechnology in improving plant production. They provide students basic and specific botanical knowledge of the most important crops from the point of view of food and processing in the food industry. In this framework, students will discover and interpret the relationships between agronomic factors vegetable production and characteristics of products, and their awareness of environmental issues will be promoted, emphasizing the need for management and conservation of natural resources in a context of sustainable development.

The preparation and presentation by the student of a specific work of matter, facilitate improving their communication skills and argumentation, while the development of autonomous learning through research and interpretation of sources

## 30809 - Production of raw materials in the food industry

of various kinds (information agri-food, agro-climatic production or harvesting, soil analysis and plant materials, etc.). The practical classes, seminars and tutorials will also affect these non-specific skills.

### 5.4.Planning and scheduling

**Calendar of summons: in-person sessions, presentation of works and exams.**

The subject, with con 6 ECTS (150 hours of work per student), has been planned with the following distribution of activities:

Lecture sessions:	46 hours
Practical activities at laboratory/classroom:	8 hours
Seminars:	6 hours
Private study:	88 hours
Assessment:	3 hours

The distribution of the educational activities, considering of the schedule of academic course and taking into account that the semester is 15 weeks, could be the following:

#### SECTION A

	Weeks 1-7	23 hours of Lecture sessions  4 hours of Practical activities  3 hours of Seminars
--	-----------	--

#### SECTION B

## 30809 - Production of raw materials in the food industry

	Weeks 8-15	<p>23 hours of Lecture sessions</p> <p>4 hours of Practical activities</p> <p>3 hours of Seminars</p>
--	------------	---

### 5.5. Bibliography and recommended resources

#### SECTION A - Production of raw materials of animal origin

ALLEN, D. 1984. Planned beef production. 2<sup>a</sup> ed. London.

BUXADE, C. 1995. Avicultura clásica y complementaria. Mundi-Prensa. Madrid.

BUXADE, C. 1995. Porcinocultura intensiva y extensiva. En: Zootecnia. Bases de Producción Animal, Tomo VI. Mundi-Prensa. Madrid.

BUXADE, C. 1996. Producción vacuna de leche y carne. Mundi-Prensa. Madrid.

BUXADE, C. 1996. Producción ovina. Mundi-Prensa. Madrid.

BUXADE, C. 1998. Ovino de carne: aspectos claves. Mundi-Prensa. Madrid.

BUXADE, C. 1999. Producción porcina: Aspectos claves. (2<sup>a</sup> edición) Mundi-Prensa. Madrid.

BUXADE, C. 2000. La gallina ponedora: sistemas de explotación y técnicas de producción. 2<sup>a</sup> ed. Mundi-Prensa. Madrid.

BUXADE, C. 2002. El ordeño en el ganado vacuno: Aspectos claves. Mundi-Prensa. Madrid.

COLE, D.J.A.; WISEMAN, J.; VARLEY 1994. Principles of pig science. Nottingham University Press. Loughborough.

DE BLAS, C.; GONZALEZ MATEOS G. 1991. Nutrición y alimentación de gallinas ponedoras. MAPA, Mundi-Prensa. Madrid.

GRAVERT, H.O. 1987. Dairy-cattle production. Elsevier Science. Amsterdam.

## 30809 - Production of raw materials in the food industry

INSTITUT TECHNIQUE du PORC 1997. Manual del porcicultor (traducción de la 5ª edición francesa). Acribia. Zaragoza, Spain.

WHITTEMORE, C.T. 1998. The science and practice of pig production, 2nd. ed. Blackwell Science. Oxford.

ZEA SALGUEIRO, J. 1990 Producción de carne con pastos y forrajes. Mundi-Prensa. Madrid.

### **SECTION B - Production of raw materials of vegetal origin**

ALPI, A.; TOGNONI, F. 1984. Cultivo en invernadero. Mundi-Prensa. Madrid.

BALDINI, E. 1992. Arboricultura general. Mundi-Prensa. Madrid.

BARCELO, J. et al 2005. Fisiología vegetal. [1ª ed. , 2ª reimp.]. Pirámide. Madrid .

CORRIDONI, L. 1990. Nociones prácticas de agronomía. Mundi-Prensa. Madrid.

CHAPMAN, S.R.; CARTER, L.P. 1980. Producción agrícola. Principios y prácticas. Acribia. Zaragoza, Spain.

DIEHL, R.; MATEO, J.M. 1988. Fitotecnia general. 2ª. ed., reimp. Mundi-Prensa. Madrid.

FINCK, A. 1988. Fertilizantes y fertilización: fundamentos y métodos para la fertilización de los cultivo. Reverté D. L. Barcelona.

FUENTES YAGUE, J.L. 2001. Iniciación a la botánica. Mundi-Prensa Madrid.

GIL-ALBERT, F. (1995-1998). Tratado de arboricultura frutal. Vol. I: Morfología y fisiología del árbol frutal. Vol. II: La ecología del árbol frutal. Vol. III: Técnicas de plantación de especies frutales. MAPA- Mundi-Prensa. Madrid.

LANGER, R.H.M.; HILL, G.D. 1987. Plantas de interés agrícola. Acribia. Zaragoza.

LÓPEZ BELLIDO, L. 1991. Cereales. Mundi-Prensa. Madrid.

MAROTO, J.V. 2000. Elementos de horticultura general. Mundi-Prensa. Madrid.

METCALFE, D.S.; ELKINS, D.M. 1987. Producción de cosechas. Fundamentos y prácticas. [1ª ed. en español de la 4ª inglesa]. Limusa. México.

PRIMO YUFERA, E.1987. Química agrícola. III Alimentos. Alhambra. Madrid.

RAMOS, E.; RALLO, L. 1992. Nueva horticultura. Tecnología y economía de los sistemas hortícolas intensivos.



## **30809 - Production of raw materials in the food industry**

Mundi-Prensa. Madrid.

SOBRINO, E.; SOBRINO, E. 1989-1992. Tratado de horticultura herbácea. Vol. I: Hortalizas de flor y fruto. Vol. II: Hortalizas de legumbre, tallo, bulbo y tuberosas. Aedos. Barcelona.