

## 28925 - Production of monogastric animals

### Información del Plan Docente

Academic Year	2016/17
Academic center	201 - Escuela Politécnica Superior
Degree	437 - Degree in Rural and Agri-Food Engineering
ECTS	6.0
Course	3
Period	Second 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 that is designed for this subject is based on the following:

The subject has a specific character orientation, so that the activities proposed focus on the various factors that involve, involved and influence farming systems and production processes of monogastric farm. It is imposing an overview of the theory and practice, supported by laboratory practices and visits to farmers, conducting individual tutoring work and another group where the student must demonstrate their ability to work in teams and to expose and defend the report on issues related to the subject. This report should be prepared following the guidelines and format similar to the specification of a PFR presentation and be in <http://jescos.unizar.es>. To better track the learning

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process will encourage students to use the tutorials through various systems and methods: conventional tutorials and more specific tutorials related to practical work. Professor facilitate your schedule as much as possible with the availability of the student.

### 5.2.Learning activities

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

interactive lectures. Study and individual / group work.

ECTS credits: 4

Teaching methodology:

- Lecture dialogue.
- Problem-based learning.
- Cooperative learning
- Agreement learning.

Practical classes of problems. Study and individual / group work.

ECTS credits: 1

Teaching methodology:

- Theoretical Troubleshooting.
- Problem-based learning.

ECTS credits: 1

Teaching methodology:

- Contact with the working reality.
- Individual study and work / group.

### 5.3.Program

#### Theoretical program

The proposed program includes 24 units that will be taught in 40 theoretical sessions and 20 practical sessions. The theoretical program will be presented to the students during the first session and will be structured in three blocks for letting them have a more global view of the theoretical part of the subject.

#### Block I - Pig production (19 hours)

Unit 1.- Situation and problems of pig sector (1 hour) - 1. General ideas. 2. Importance of productions - census, productivity and economic value in the world, Europe and Spain. 3. Pig production systems in Spain - intensive farming (characteristics, classification, organization of production), extensive and semi-extensive farming. 4. Future perspectives in the EU environment.

Unit 2.- Reproductive management in pig livestock (3 hours) - 1 Short physiological review of pig reproduction. 2. Reproductive objectives. 3. Factors that influence breeding failing. 4. Strategies of reproductive intensification. 5. Labour induction and labour management. 6. Handling the sow during the post-partum and new-born care. 7. Handling the sow and the piglets while breastfeeding. 8. Mortality of suckling piglets. 9. Weaning and transition. 10. Handling the boar - factors that influence the reproductive efficiency of the male, reproductive and general handling. 11. Reproductive rates and reproductive efficiency.

Unit 3.- Genetic improvement in pig livestock (1 hour) - 1. Main breeds and crossbreeds used in pig production. 2. Aspects to take into account for genetic improvement and heritability. 3. Selection - objectives. 4. Cross-breeding - objectives and schemes of cross-breeding (two, three and four ways). 5. Possibilities of supply of hybrid females by the farmer. 6. Hybridisation and selection in Spain.

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Unit 4.- Management of feeding in reproductive pig livestock (3 hours) - 1. Importance, objective and short review of bases. 2 Foods and feeding systems. 3. Management of piglet feeding. 4. Sow feeding in reposition. 5. Management of sow feeding during the different stages of reproductive cycle (lactation, mating, gestation, post-partum) - capacity of ingestion, needs and recommendations. 6. Example of rationing. 7. Boar feeding. 8. Determination of physical condition.

Unit 5.- Intensive production of pig meat (2 hours) - 1. Introduction and objectives. 2. Analysis of the factors that influence the intensive fattening. 3. Phases of fattening and formation of lots. 4. Feeding during transportation and fattening - quantitative and qualitative criteria. 5. General rules for managing and for the environment in the phase of transition and fattening. 6. Peculiarities of growing-finishing of breeders.

Unit 6.- Extensive and semi-extensive pig production. (1 hour) - 1. Generalities. 2. Fundamentals and objectives of the extensive systems in the Mediterranean area. 3. Iberian pig - feeding, reproductive management and genetic improvement. 4. Campsite type farms. 5. Analysis of the interest of extensive pig production.

Unit 7.- Quality of carcase and pig meat (1 hour) - 1. Definition of carcase. 2. Classification of carcasses and carcase return. 3. Characteristics of pig meat. 4. Factors that influence the quality of carcasses and pig meat.

Unit 8.- Premises and equipment for pig livestock (4 hours) - 1. Introduction - general criteria of premises for pig livestock. 2. Characteristics of premises for pig livestock - environmental requirements, water consumption, behaviour and regulations. 3. Premises in intensive pig farms - housing for breeders. Housing for dry or pregnant sows - in group or in a fix place. Intensive housing for lactating sows - general criteria, dimensions of a farm based on management by lots, and productive level. Labour cell - general characteristics, cages, ground and heat sources for piglets. Housing for boars. Installations in premises for growing-finishing and fattening. 4. Installations in premises in extensive systems. 5. Installations for waste water and livestock excrement. 6. Hygiene and health management in pig farms - main infectious and parasitic processes and their control. Hygiene and farming wastes.

Unit 9.- Organization and control of pig farms (3 hours) - 1. Planning and organization of pig farm - conditioning factors. 2. Optimization of productive factors. 3. Aspects of the integration system in pig production. 4. Introduction of technical and economic pig management. 5. Control of results through technical and economic indexes. Study of a particular case - collection, register and processing of data. Analysis, interpreting and diagnosis. Decision making. 6. IT and management. 7 Ethnology. 8 Wastes. 9 I+D+i.

### Block II - Poultry keeping (15 hours)

Unit 10.- Poultry farms (1 hour) - 1. Poultry industry and its evolution. 2. General characteristics of domestic poultry - physiological particularities. 3. Production types and systems. Censuses and productions in Spain - their distribution. 4. Economic importance of poultry keeping and future perspectives.

Unit 11.- Reproductive management and genetic improvement of hens (2 hours) - 1. Short physiological review of poultry reproduction. 2. Broodiness and moult. 3. The cycle of laying and its graphical representation. 4. Genetic improvement of hens - achievements. 5. Qualitative characters - its practical interest. 6. Quantitative characters in the improvement of eggs and meat. 7. Selection - current approaches. 8. Cross-breeding in poultry keeping - commercial hybrids. Interesting strains in Spain - return comparison and election criteria.

Unit 12.- Artificial incubation (2 hours) - 1. Initial embryonic development. 2. Handling the egg before incubation - collection, classification, treatments and storage. 3. Handling in the incubation room. Incubation - environmental conditions and general handling. Hatchability - variation factors. 4. Transfer to hatchers 5. Handling after the chicken is born. 6. Selection and transport. 7. Hygiene during the incubation process.

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Unit 13.- Breeding and growing-finishing of pullets (1 hour) - 1. Zootechnical characteristics. 2. Housing systems - advantages and disadvantages; environment and necessary equipments. 3. General management. 4. Lighting programs for the growing-finishing process. 5. Practical feeding rules. Food restriction - interest and necessary conditions. 6. Breeding of future breeders - differentiating features.

Unit 14.- Exploitation of breeder hens (2 hours) - 1. General characteristics. 2. Housing, environmental conditions, installations and equipment. 3. General management. 4. Productive returns. 5. Feeding rules. Feeding management in heavy breeders. Dual feeding. 6. Hygiene during the collection of hatching eggs.

Unit 15.- Exploitation of commercial laying hens (2 hours) - 1. Battery farming - housing, environmental conditions, installations and equipment, regulations. 2. General management. 3. Productive returns. 4. Feeding rules. 5. Alternative systems to battery farming.

Unit 16.- Production of poultry meat (2 hours) - 1. Broiler chicken - productive characteristics. 2. Factors that influence productivity in fattening. 3. Rules for housing, environmental conditions, installations and equipment. 4. General management. 5. Feeding. 6. Systems for obtaining label chickens.

Unit 17.- Quality of eggs, carcass and poultry meat (1 hour) - 1. The importance of quality. 2. Parameters of external and internal quality of eggs, variation factors and possibilities for improvement. 3. Parameters of external quality of the carcass and modifying factors. 4. Return, conformation and composition of the carcass. 5. Quality of meat and its variation factors.

Unit 18.- Development of a farm (2 hours) - 1. Technical and economic factors - valuation and combination. 2. Objectives - quality of the carcass. 3. Register and control of the refunds. 4. Quality control of poultry products. 5. Regulations. 6. Management. 7. Production costs. 8. Ethnology. 9. Wastes. 10. I+D+i.

Block III - Rabbit keeping (6 hours)

Unit 19.- The specie (&frac12; hour) - 1. Original species. 2. Biology and behaviour. 3. Reproductive potential. 4. Mortality - pathologies, vaccines. 5. Domestication. 6. Comparison with other species in the market. 7. Environmental needs.

Unit 20.- Production of the sector (&frac12; hour) - 1. Global production. 2 Consumption in Spain and other countries. 3. Market prices. 4. Market evolution. 5. Exploitation by Spanish regions. 6. Rabbits by Spanish regions. 7. Zootechnical classification. 8. La Lonja Ibérica. 9. SANDACH.

Unit 21.- Rabbit farms (1 hour) - 1. Fundamentals and environmental needs. 2. Premises: area and material. 3. Housing or rabbit hutch - types, mother cages, nests, broiler cage, cages for males, materials, drinking troughs. 4. Cleaning equipments - detections. 5. Ecological farms - objectives, El majano.

Unit 22.- Reproduction (1 hour) - 1. Reproduction - sexual organs. 2. The male. 3. Male/female. 4. The female - pseudo-gestation, acceptance and mating, mating and elimination, the female and its environment. 5. Reproductive control - induction of receptivity. 6. Genetic improvement - simple cross-breeding (2, 3 and 4 ways), backcrossing, objectives of selection in rabbit keeping, selected lines in Spain. 7. Artificial insemination. 8. Gestation and labour - diagnosis, nests, birth.

Unit 23.- Feeding and management (1,5 hours) - 1. Lactation - milk, lactation and weaning. 2. Digestive system of rabbits. 3. Cecotrophía. 4. Farm management. 5. Fattening. 6. Reposition. 7. Production. 8. Farm management - traditional, extensive, semi-extensive and intensive systems. 9. Female rabbit, cages and young rabbits. 10. Management in bands.

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11. Diseases - eliminations, diseases by categories, digestive pathologies. 12. Formulation - fibre, quantity, energy, production peculiarities, feedstuff.

Unit 24.- How to create a rabbit farm (1,5 hours) - 1. Ethnology - race, strain and line, races by product, commercial hybrids. 2. Creating a farm - production costs. Basic and objective considerations, behaviour, global objective. 3. Controlling the farm - files of males and females, productive indexes, example. 4. Wastes - organic and inorganic wastes, uses, hoy to act, manure/agricultural land, composition and comparison with other species. Estimate of the produced quantity. 5. Regulations: RAMINP, procedure. 6. I+D+i - comparison with other species, productive indexes, France vs. Spain.

### Content of practical sessions

PRACTICAL SESSIONS (20 hours)

Practical session 1.- Visit and discussion intensive pig farm (4 hours)

Practical session 2.- Visit and discussion broiler hen farm (3 hours)

Practical session 3.- Visit and discussion chicken farm (3 hours)

Practical session 4.- Genealogic analysis - calculation of inbreeding coefficient (1 hour)

Practical session 5.- Determination of the quality of the eggs for consumption and incubation (2 hours)

Practical session 6.- Determination of the quality of meat (2 hours)

Practical session 7.- Technical and economic management of livestock. Search of information and functioning of Software for livestock management (1 hour)

Practical session 8.- In-class sessions about the control systems of critical points. Calculation of indexes for quality control and farm management (2 hours)

Group tutorials (2 hours)

Practical session 10.- Visit and discussion farm selected by students (not taken into account for final mark/grade)

### 5.4.Planning and scheduling

Schedule sessions and presentation of works

Weeks	Lectures	Lab practices	Seminars outputs field	Individual work	Evaluation
1	2			5	
2	2		4	15	
3	2		3	12,5	
4	2		3	12.5	
5	4			10	
6	4			10	
7	4			10	

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8	4			10	
9	4			10	
10	2	1		7,5	
11	2	2		10	
12	2	2		10	
13	2	1		7,5	
14	2	2		10	
15	2	2		10	
16					5
Total	40	10	10	150	5

### 5.5. Bibliography and recommended resources

- Basic
- Ganado porcino : diseño de alojamientos e instalaciones / Fernando Forcada... [et al.] . Zaragoza : Servet, D.L. 2009
- Control de la reproducción en el conejo / obra colectiva dirigida y coordinada por Mario R. Alvaríño . [1ª ed.] Madrid : Ministerio de Agricultura, Pesca y Alimentación, IRYDA : Mundi-Prensa, 1993
- Buxadé Carbó, Carlos. El pollo de carne : sistemas de explotación y técnicas de producción / Carlos Buxadé Carbó ; con la colaboración de Ismael Ovejero Rubio ; prólogo de E. Pérez Adsuar . [2a. ed. rev.] Madrid : Mundi-Prensa, 1988
- Buxadé Carbó, Carlos. La gallina ponedora : sistemas de explotación y técnicas de producción / Carlos Buxadé Carbó . 2ª ed., act. y amp. Madrid [etc.] : Mundi-Prensa, 2000
- Producción animal acuática / coordinador y director, Carlos Buxadé Carbó ; con la participación de 23 autores . Madrid [ etc.] : Mundi-Prensa, 1997
- Complementary
- Producciones cinegéticas, apícolas y otras / coordinador y director Carlos Buxadé Carbó ; con la participación de 20 autores . Madrid [ etc.] : Mundi-Prensa, 1997
- Porcinocultura intensiva y extensiva / coordinador y director, Carlos Buxadé Carbó ; con la participación de 26 autores . Madrid [etc.] : Mundi-Prensa, 1996
- Producción vacuna de leche y carne / coordinador y director, Carlos Buxadé Carbó ; con la participación de 23 autores . Madrid [etc.] : Mundi-Prensa, 1996
- Producción ovina / coordinador y director, Carlos Buxadé Carbó ; con la participación de 25 autores . Madrid [etc.] : Mundi-Prensa, 1996
- Producción caprina / coordinador y director Carlos Buxadé Carbó ; con la participación de 28 autores . Madrid [etc.] : Mundi-Prensa, 1996
- Reproducción y alimentación / coordinador y director Carlos Buxadé Carbó ; con la participación de 37 autores .

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- Madrid [etc.] : Mundi-Prensa, 1995
- Alimentos y racionamiento / coordinador y director Carlos Buxadé Carbó ; con la participación de 29 autores . Madrid [etc.] : Mundi-Prensa, 1995
  - Avicultura clásica y complementaria / coordinador y director, Carlos Buxadé Carbó ; con la participación de 18 autores . Madrid [etc.] : Mundi-Prensa, 1995
  - Genética, patología, higiene y residuos animales / coordinador y director Carlos Buxadé Carbó ; con la participación de 29 autores . Madrid [etc.] : Mundi-Prensa, 1995
  - Estructura, etnología, anatomía y fisiología / coordinador y director Carlos Buxadé Carbó ; con la participación de 21 autores . Madrid [etc.] : Mundi-Prensa, 1995
  - Producciones equinas y de ganado de lidia / coordinador y director Carlos Buxadé Carbó . Madrid [ etc.] : Mundi-Prensa, 1996
  - Producciones cunícola y avícolas alternativas / coordinador y director Carlos Buxadé Carbó . Madrid [ etc.] : Mundi-Prensa, 1996
  - Forcada Miranda, Fernando. Alojamiento para ganado porcino / Fernando Forcada Miranda . 1ª ed. Zaragoza : Mira, 1997
  - Orozco Piñán, Fernando. Mejora genética avícola / Fernando Orozco Piñán . [1a. ed.] Madrid : Mundi-Prensa, 1991
  - Baselga Izquierdo, Manuel. Mejora genética del conejo de producción de carne / M. Baselga Izquierdo, A. Blasco Mateu . [1a. ed.] Madrid : Mundi-Prensa, 1989
  - Tratado de cunicultura. Vol.1, Principios básicos, mejora y selección, alimentación / por Francesc Lleonart Roca...[et al.] . [1a. ed.] Arenys de Mar (Barcelona) : Real Escuela Oficial y Superior de Avicultura, 1980
  - Tratado de cunicultura. Vol.2, Construcciones, manejo y producciones / por Toni Roca Casanovas, José A. Castelló LLobet y Jaime Camps Rabada . [1a. ed.] Arenys de Mar (Barcelona) : Real Escuela Oficial y Superior de Avicultura, 1980
  - Tratado de cunicultura. Vol.3, Patología e higiene / por Francesc Lleonart Roca . [1a. ed.] Arenys de Mar (Barcelona) : Real Escuela Oficial y Superior de Avicultura, 1980
  - Guía John Gadd de soluciones en producción porcina / [revisión : Lorenzo Fraile] ; [traducción : Jesús Laborda, Sergio Fuentes, Belén González ] . Zaragoza : Servet, Diseño y Comunicación, D. L. 2005