

## 28942 - Ruminant production

### Información del Plan Docente

Academic Year	2017/18
Faculty / School	201 - Escuela Politécnica Superior
Degree	437 - Degree in Rural and Agri-Food Engineering
ECTS	6.0
Year	4
Semester	First semester
Subject Type	Compulsory
Module	---

### **1.General information**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

The learning process is based on providing to the student the concepts and the basic tools for further learning of the most relevant technological applications in animal science. Combining the fundamental approach of the theoretical classes with a set of practical activities will allow a better understanding of the technologies and at the same time show its applicability.

#### **5.2.Learning tasks**

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The program offered to students includes, among others. the following activities: theory classes, visits to farms, case studies and Lab practices

### 5.3.Syllabus

#### Theory programme

#### Block I Beef cattle (9h)

Topic 1 - Description of the bovine sector (1h)

1. Historical background
2. Importance of production: Censuses, production, commerce and consumption on a global, European Union and Spanish level
3. Current structure of cattle farms in Spain
4. The environment and the exploitation system
5. Institutional assistance for cattle production
6. Applicable legislation

Topic 2 - Beef cattle farming -1 (2h)

1. Introduction
2. Production systems: introduction, general characteristics of the extensive systems, the mountain system, the pasture system, the humid Spain system
3. Replenishment
4. Reproduction management
5. Genetic base and improvement

Topic 3 - Beef cattle farming -2 (2h)

1. Feeding: Nutritional needs and ingestion capacity during the producing cycle, formulating rations, the importance of corporal conditions

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2. Hygienic-sanitary handling in beef cattle farming

3. Beef cattle animal welfare

4. Shelter and installations for extensive cattle

5. Farm planning and technical-economical management

Topic 4 - Rearing and fattening calves in an intensive regime (2h)

1. Introduction and genetic bases

2. Commercial categories in beef cattle

3. Handling and feeding suckling calves

4. Growth and finishing: Nutritional needs and ingestion capacities, food handling

5. Animal welfare in fattening calves

6. Installations for fattening cattle

7. Technical-economical management

Topic 5 - Quality of the bovine carcass (2h)

1. Introduction and basic concepts

2. Definition of carcass

3. Quality of the carcass

4. Classification of the carcasses

5. Factors affecting the quality of the carcass and the carcass yield

6. Spanish and European legislation and brands of quality

### **Block II - Dairy cattle (12h)**

Topic 6 - Dairy cattle farming (2h)

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1. Introduction and recap on the animal basis
2. Description of the productive cycle
3. Dairy cattle livestock breeding and raising
4. Hygienic-sanitary handling in the dairy cattle farm
5. Animal welfare in dairy cattle

### Topic 7 - Reproductive handling and genetic improvement in dairy cattle (2h)

1. Introduction
2. Handling the reproduction: Importance and objectives, reproductive rates, strategies of reproductive intensification, management during delivery and postpartum, voluntary waiting period, implementation of reproductive control, factors influencing reproductive failure.
3. Genetic improvements in dairy cattle

### Topic 8 - Dairy cattle feeding (2h)

1. Introduction
2. Importance and objectives
3. Evaluation of the nutritional needs and ingestion capacity during the reproductive cycle
4. Formulating rations for each phase of the reproductive cycle
5. Feeding systems
6. Evaluating the corporal condition and weight

### Topic 9 - Lactation and milking (2h)

1. Introduction
2. Study of lactation curves
3. Parameters of milk quality

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4. Factors affecting the quality and quantity of cow's milk

5. Milk testing

6. Mastitis and its prevention

7. Milking: Phases and velocity of milking; yield and work organisation (milking routine and milking hygiene); milking frequency; mechanical milking (sanitation of the milking installations; possibilities for checking the milk)

8. Drying

Topic 10 - Dairy cattle livestock installations (2h)

1. Introduction: General criteria of livestock installations, factors affecting the dairy cattle installations

2. Example of the general layout of a medium sized dairy farm

3. Classical free stabling vs. free stabling with cubicles

4. Machines and equipment associated with feeding in free stabling

5. Heat protection systems

6. Stabling suckling calves

7. Stabling growing calves

8. Welfare regulations for calves

9. Installations for waste water and livestock excrement

Topic 11 - Technical-economic management of the dairy cattle business (2h)

1. Introduction to technical-economic management

2. Gathering, recording and preparing data

3. Monitoring the results according to technical and economical indices

4. Profitability study

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5. IT and management

6. Specific case study: Analysis, interpretation, diagnosis and decision making

### **Block III - Sheep and goat production (19h)**

Topic 12 - Description of the sheep and goat sector (2h)

1. Historical background

2. Importance of the production: Censuses, productions, commerce and consumption on a global level, in the European Union and in Spain

3. Current structure of the sheep and goat farms in Spain

4. The environment and the farming system

5. Institutional assistance for sheep and goat production

6. Applicable legislation

Topic 13 - Meat sheep farming -1 (2h)

1. Introduction

2. Reproduction: The importance of reproduction in sheep production: Limitations and possibilities, reproductive control, intensive reproduction, organising and handling reproduction

3. Genetic improvements in meat sheep

Topic 14 - Meat sheep farming-2 (2h)

1. Handling sheep livestock: General, general farm handling, shearing, handling lambs

2. Hygienic-sanitary handling

3. The environment and animal welfare

4. Sheep carcass quality

5. Skin and wool production

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### Topic 15 - Milk sheep farming (3h)

1. Introduction and recap of the animal base
2. Reproductive handling and genetic improvement
3. Lactation curves
4. Factors affecting the quality and quantity of the milk
5. Milking: Manual milking and mechanical milking, milking phases and the milking velocity, handling the milking
6. Drying

### Topic 16 - Sheep feeding (2h)

1. Introduction
2. Nutritional needs and ingestion capacity during the production cycle
3. Formulating rations
4. Importance of corporal condition. The use of sub-products
5. Handling the flock in the pasture

### Topic 17 - Goat farming (2h)

1. Introduction
2. Differentiating characteristics from the sheep species
3. Reproduction and genetic improvement
4. Meat production
5. Goat's milk production
6. General running of goat farms
7. Hygienic-sanitary handling

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### Topic 18 - Goat feeding (2h)

1. Introduction
2. Nutritional needs and ingestion capacity during the production cycle
3. Formulating rations
4. Importance of corporal condition
5. Handling the flock in the pasture

### Topic 19 - Technical-economic small ruminant farming (2h)

1. Introduction
2. Gathering, recording and preparing data
3. Monitoring the results according to technical and economical indices
4. Profitability study
5. IT and management
6. Specific case study: Analysis, interpretation, diagnosis and decision making

### Topic 20 - Installations for small ruminants (2h)

1. Installations for sheep livestock
2. Extensive and intensive systems
3. Feedlots
4. Milking rooms and dairies
5. Diverse material and tools
6. Installations for goat livestock
7. Environmental issues of sheep and goat farming



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8. Hygiene of the installations

9. Welfare of small ruminants

### Practical Programme

Practical 1: Visit to a beef cattle farm

Practical 2: Meat quality in ruminants

- Importance of meat quality. pH. Colour. Water retention capacity. Firmness. Colour and fat consistency. Smell and flavour.

Practical 3: Visit to a dairy cattle farm

Practical 4: Formulating cattle rations

- Formulating rations for beef cattle, veal calves and dairy cattle

Practical 5: Visit to a sheep meat farm

Practical 6: Formulation of feedstuffs for small ruminants

- Formulating rations for sheep and goats in different physiological phases and for lambs and kids

Practical 7: Technical-economical management of ruminants

- Handling and interpreting technical-economical management programmes for ruminants

### 5.4.Course planning and calendar

Week	Theoretical class (2 h)	Practical class (2 h)	Independent work	Total
1	Unit 1 Unit 2		(2 h)	6
2	Unit 3 Unit 4	Práctica 1	(4 h)	13
3	Unit 5		(4 h)	8

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	Unit 6			
<b>4</b>	Unit 7 Unit 8		(4 h)	8
<b>5</b>	Unit 9 Unit 10	Práctica 2	(4 h)	13
<b>6</b>	Unit 11		(2 h)	4
<b>7</b>	Unit 12		(2 h)	4
<b>8</b>	Unit 13		(2 h)	4
<b>9</b>	Unit 14	Práctica 3	(2 h)	9
<b>10</b>	Unit 15	Práctica 4	(2 h)	9
<b>11</b>	Unit 16		(4 h)	6
<b>12</b>	Unit 17		(4 h)	6
<b>13</b>			(8 h)	8
<b>14</b>			(8 h)	8
<b>15</b>			(8 h)	8
<b>16</b>	Unit 18		(4 h)	6
<b>17</b>	Unit 19		(4 h)	6
<b>18</b>	Unit 20		(4 h)	6
<b>19</b>			(8 h)	8
<b>20</b>	Evaluation		(6 h)	10

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Hours	44	20	86	150
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### 5.5. Bibliography and recommended resources

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- BB** Ovinotecnia : producción y economía en la especie ovina : homenaje al profesor Isidro Sierra Alfranca / edición y coordinación Carlos Sañudo Astiz y Ricardo Cepero Briz . 1ª ed. Zaragoza : Prensas Universitarias de Zaragoza, 2009
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- BB** Vacuno de carne : aspectos claves / coordinador y director Carlos Buxadé Carbó ; con la participación de 41 profesionales . Madrid : Mundi-Prensa, 1997
- BB** Vacuno de leche : aspectos claves / coordinador y director Carlos Buxadé Carbó ; con la participación de 35 profesionales . Madrid : Mundi-Prensa, 1997
- BC** Abecia Martínez, Alfonso. Manejo reproductivo en ganado ovino / Alfonso Abecia Martínez, Fernando Forcada Miranda . Zaragoza : Servet, [2010]
- BC** Alimentación de bovinos, ovinos y caprinos / obra colectiva dirigida por J.[i.e.R.] Jarrige ; versión española de Javier González Cano . Madrid : Mundi-Prensa, 1990
- BC** Alojamientos e instalaciones. I / Coordinador y director, Carlos Buxadé

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Alojamientos e instalaciones. II /  
BC Coordinador y director, Carlos Buxadé  
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BC Avances de la ciencia de la producción  
lechera / coordinador, C.J.C. Phillips ;  
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BC Bienestar animal y ganado porcino : mitos  
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Buxadé Carbó, Dionisio López Montes ;  
con la participación de 11 profesionales .  
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BC Blas Beorlegui, Carlos de. Producción  
extensiva de vacuno / Carlos de Blas  
Beorlegui ; con la colaboración de Jesús  
Alegre Alvaro...[et al.] . Madrid :  
Mundi-Prensa, 1983  
BC Committee on Animal Nutrition (2000).  
Nutrient requirements of beef cattle.  
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BC Corcy, Jean-Christophe. La cabra /  
Jean-Christophe Corcy ; versión española  
de J. Gallego García . Barcelona : Aedos ;  
Madrid : Mundi-Prensa, 1993  
BC Daza Andrada, Argimiro. Ganado caprino :  
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Argimiro Daza Andrada, Carlos Fernández  
Martínez, Antonio Sánchez López . Madrid  
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Diseño y Comunicación S.L., D.L. 2006  
BC Gestión técnica de granjas de vacuno  
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coordinador : Pedro José Álvarez Nogal .  
León : Universidad de León, D.L. 2008  
BC Gordon, Ian. Reproducción controlada del  
ganado vacuno y búfalos / Ian Gordon ;  
traducido por Mariano Illera Martín .  
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- BC** Producción vacuna de leche y carne / coordinador y director, Carlos Buxadé Carbó ; con la participación de 23 autores . Madrid [etc.] : Mundi-Prensa, 1996
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- BC** Sañudo Astiz, Carlos. Calidad de la canal en la especie ovina / Carlos Sañudo, Isidro Sierra. Madrid : Ministerio de Medio Ambiente y Medio Rural y Marino, Centro de Publicaciones, D.L. 2009
- BC** Sañudo Astiz, Carlos. Variación morfológica en bovino lechero / C. Sañudo, C. Sánchez García, J. M. Marcén.

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The updated recommended bibliography can be consulted in:  
<http://psfunizar7.unizar.es/br13/egAsignaturas.php?id=8103>