

**Production and Health of Small Ruminants**

Code: 103969  
ECTS Credits: 3

Degree	Type	Year	Semester
2502445 Veterinary Medicine	OT	5	0

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

### Contact

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### Use of Languages

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

### Teachers

Mariano Domingo Álvarez  
Xavier Manteca Vilanova  
Alberto Oscar Allepuz Palau  
Ahmed Salama Fadali

### Prerequisites

Although there are no official prerequisites, it is recommended that the student has passed the subjects of Integrated Animal Production I and II, Animal Health I, II and III, as well as reviewing the contents of the subject Basics of Production and Animal Management of the 1st year.

### Objectives and Contextualisation

The aim of the course is to specialize students, who have previously taken the compulsory subjects of the Degree in Veterinary Medicine, in the production and health of sheep and goats in a professional manner and in accordance with current production trends in this livestock subsector.

The contents of the subject are organized in 4 units (production, health, welfare and sustainability, and case study and report), focused on the socioeconomic study of the subsector of small ruminants, animal material (breeds and genes of interest), production systems, reproductive planning and care, production (meat, fiber and milk), health (disease control and health planning), and the welfare and sustainability of farms, all aimed at improving their profitability and herd health.

At the end of the course, the student must be able to plan and intervene favourably in the planning, reproduction, management, feeding, health and welfare of sheep and goat herds in different productive situations.

### Competences

- Analyse, synthesise and resolve problems and make decisions.
- Apply scientific method to professional practice, including medicine
- Assess and undertake epidemiological studies and therapeutic and preventive programs in accordance with the standards of animal welfare, animal health and public health.
- Comunicar la informació obtinguda durant l'exercici professional de manera fluïda, oralment i per escrit, amb altres col·legues, autoritats i la societat en general.
- Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.
- Value and interpret the production and health parameters of one animal group, considering the economic and welfare aspects.

## Learning Outcomes

1. Analyse, interpret and evaluate the production and healthcare parameters of a farm or fishery and produce a plan of corrective actions considering the factors of animal welfare, environmental protection and product quality.
2. Analyse, synthesise and resolve problems and make decisions.
3. Apply a health plan to concrete situations in accordance with the productive and economic aspects of a livestock farm or fishery and the ethical, social and normative limitations.
4. Apply scientific method to professional practice, including medicine
5. Communicate information obtained during professional exercise in a fluid manner, orally and in writing, with other colleagues, authorities and society in general.
6. Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.

## Content

### THEORY PROGRAM

The contents of the subject will be delivered in a non-presential format. Synchronic voluntary sessions will be programmed for clarification of doubts of the students, via Teams platform, for each of the different units. The clinical cases and the report to be exposed will be done in a mixed presential-non-presential format.

#### Unit I. Production of small ruminants

##### Subject 1. The productive Sector

The sheep and goat subsector worldwide and nationally. Productive and non-productive functions of sheep-goat farming. The CAP, CMO and community aid for small ruminants. Health status of small ruminants. Integration of production and health.

##### Subject 2. Production systems

The archetype system of sheep-goat production. Classification and criteria of productive intensification. Sheep and goat production cycles.

##### Subject 3. The reproductive planning of a herd

Methods of control of reproduction in sheep and goats. Reproductive planning. Productive indices and assessment of livestock productivity. Mating, insemination, and transfer of embryos. Pregnancy and birth.

##### Subject 4. The production of meat and wool

Production schedule for meat sheep: seasonal and out of season. Wool production. Productive calendar for meat goats. Natural and artificial lactation. Production of lambs. Weaning. Lamb fattening. Characteristics and assessment of the carcasses: milky, light and heavy. Fattening facilities. Breeding stock replacement for sheep and goats.

#### Subject 5. Milk production

Production calendar for dairy sheep: seasonal and out of season. Lactation curve and milking equipment for sheep. Productive calendar for dairy goats and productive particularities. Trough health and milk quality. Production costs.

#### Subject 6. The feeding of small ruminants

Nutritional needs of sheep and goats. Voluntary ingestion. Body reserves. Forage calendars and feed available. Feed strategies. Rationing of sheep and goats by the INRA system.

### Unit II. Health of small ruminants

#### Subject 7. Disease control and preventive measures

Diagnosis, prevention, and control of the main diseases: abortions, diarrhoea in young and adult sheep and goats, respiratory diseases, trough diseases.

#### Subject 8. Health planning of the flocks

Health control plans for the main diseases in sheep and goats.

#### Subject 9. Study of health problems

Specific cases of disease in small ruminants.

### Unit III. Welfare and sustainability of small ruminant farms

#### Subject 10. The facilities

Facilities for sheep and goat herds: meat production and milk production. Needs of animals and design of farms.

#### Subject 11. Sustainability in small ruminant farms

Concept of sustainability. Impact of small ruminant farms on the environment. Productive alternatives: organic production

#### Subject 12. Indicators and protocols for assessing the welfare of sheep and goats

Indicators and protocols for assessing the welfare of sheep and goats. Main problems that can affect the welfare of these species

#### Subject 13. Welfare of sheep and goats

Discussion of a specific welfare problem in a sheep / goat farm.

### Unit IV. Case Study and Case report.

Students will prepare and expose a CASE REPORT based on real data from a farm :

- Comprehensive planning and improvement of a small ruminant farm: after collecting information on production, health and welfare of a small ruminant farm, an analysis will be made of it, identifying the critical points, and proposing an improvement plan of the different aspects.

and a BIBLIOGRAPHICAL REVIEW WORK:

- Research work or technical study: published in an indexed research journal or other sources, which allows the students to evaluate various problems in the sector and measures to be applied.

Both works will perform in teams of **2-3 students**, and must be presented and discussed at a seminar attended by several students and members of the teaching team.

## INTERNSHIP AND SEMINARS PROGRAM

### 1. Practices on the farm (6 h)

#### 1.1 General management of sheep and goats (2 h)

Practice on the UAB farm. Production system. External examination in adults. Visual and electronic identification systems. State of the truss. Reproduction and pregnancy diagnosis. The use of ultrasonography.

#### 1.2 Assessment of welfare (1 h)

Application of welfare assessment protocols on the UAB farm.

#### 1.3 Collection of health information (1 h)

Health status of the herd and problems detected on the UAB farm.

#### 1.4. Attention of parts (2 h)

As far as possible, birth supervision with assistance to sheep and / or goats and new-borns.

### 2. Computer practices (2 h)

#### 2.1. Calculation of rations for sheep and goats (2 h)

Nutritional needs. Food valuation. Spreadsheets. Use of the INRAration program for goats and sheep. Fattening lambs.

### 3. Health seminars (6 h)

#### 3.1. Presentation of the situation of a herd, of the sector, or of external clinical cases in ovine and goat health (2 h)

Presentation and discussion of various productive and health cases by a farmer, veterinarian, or person in the sector: production, welfare and health problems in current daily practice and how to address them.

#### 3.2. Discussion and Evaluation of Clinical Cases (2h)

Debate on how to approach the diagnosis of the different CLINICAL CASES and their resolution by the students in small groups, previous explanation in classroom (Subject 9) of different cases received in the service of necropsies and infectious diseases.

#### 3.3. Presentation of current issues in sheep and goat health (2 h)

Presentation and discussion of current issues in research in sheep and goat health.

Depending on the restrictions that may be imposed by the health authorities according to the evolution of the pandemic, reductions or prioritization of the contents of the subject may be carried out.

## **Methodology**

The centre of the learning process is the work of the student. The student learns by working, and the teacher's mission is to help him in this task by providing him with information or showing him the sources where it can be achieved and directing his steps so that the learning process can be carried out effectively. In line with these ideas, and in accordance with the objectives of the course, the development of the course is based on the following methodologies and activities:

#### 1. Working methods based on participatory lectures.

The student acquires the own knowledge of the subject attending the lectures and complementing them with the personal study of the explained subjects. The lectures are conceived as a fundamentally unidirectional method of transmission of knowledge from the teacher to the student although the participation of the student during the same will be encouraged.

## 2. Practical work methods.

The practical work pursues that the student approaches the professional reality, that relates the theoretical concepts studied and that stimulates his deductive aptitudes in the process of learning. In addition, the practical work allows the student to learn what their behavior should be in front of the animals and the measures of use and protection to be taken by the animal, people and equipment or facilities.

## 3. Methods aimed at discussion and / or teamwork.

Through team or group work, the student is encouraged to take an active role in the learning process. Through cooperative learning the student increases his motivation, strengthens attitudes of involvement and initiative, improves the degree of understanding of what he does, the degree of mastery of procedures and concepts and creates a positive social relationship.

## 4. Autonomous work.

Autonomous work is a methodology focused mainly on the student, although the teacher also has a prominent role in this process. The goal is to get students to develop skills to set their learning goals, choose between different ways of learning, set their own pace, plan and organize their work, discover, and solve problems, make decisions and assess their own progress.

Autonomous learning encourages various transversal competences and becomes an essential teaching method.

### **Practical exercises:**

Farm practices (data collection and analysis), computer science (ration calculation) and seminars (clinical cases) will in some cases have complementary derived exercises, which students will have to solve individually or in groups, and which will be they will use as an assessment tool.

### **Study:**

It is estimated that the student will have to spend a total of 12 hours studying and understanding the content of the subject.

The proposed teaching methodology may undergo some modifications depending on the restrictions on attendance imposed by the health authorities.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## **Activities**

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Computer classroom practices	2	0.08	1, 2, 5
Farm practices	6	0.24	2, 4

Health seminars of small ruminants	6	0.24	1, 2, 4, 3, 5
Theory	13	0.52	1, 2, 4, 3
Type: Supervised			
Calculation of rations	1	0.04	1, 2, 4
Tutoring case and practical work	4	0.16	2, 4
Type: Autonomous			
Practical exercises	3	0.12	2, 4, 6
Preparation of cases and work	25	1	1, 2, 4
Study	12	0.48	1, 2, 3

## Assessment

For the calculation of the final note of the course we will take into account the works performed in the diverse fields of the course, with the following qualifications.

1. Participation in practice work and problem solving (5%)
2. Presentation and public defense of a practical case of Planning and integral improvement of an exploitation of small ruminants, in seminar (40%)
3. Presentation and public defense of a research project or technical study, in seminar (25%)
4. Active participation in classroom discussions and in resolution of clinical cases in seminar (30%)

### OVERCOMING THE SUBJECT

To pass the subject it will be necessary:

- Attendance to laboratory / field practices (absence must be justified).
- Presentation and defense of practical case, research project, and clinical case.
- Get more than 5 points out of 10 in the overall subject.

### NOT PRESENTED

Those students who have been evaluated in less than 75% of the potential final grade of the subject will be considered non-presented.

The proposed assessment may be subject to change depending on the attendance restrictions imposed by the health authorities.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Active participation in classroom discussion and in the resolution of a clinical case	30%	1	0.04	2, 4, 3
Participation in practices and resolution of exercises	5%	0	0	2
Presentation and public defense of a practical case of planning and integral	40%	1	0.04	1, 2, 4, 3,

## Bibliography

### Electronic books (CAB eBooks )

Accessible from the UAB:

<https://www.cabi.org/cabebooks/search?topics=9d893a58-b1ce-4e46-af28-c2980d916b92&types=23&sort=Date>

Others:

Goat meat production and quality.

Editor(s): Mahgoub, O. Kadim, I. Webb, E.

2012 CABI (H ISBN 9781845938499)

Mastitis control in dairy herds.

Editor(s): Blowey, R. Edmondson, P.

2010 CABI (H ISBN 9781845935504)

### Other books:

AITKEN I.D. 2007. Diseases of sheep. Blackwell Publishing, Oxford, 641 pp.

AWIN, 2015. AWIN welfare assessment protocol for sheep. DOI: 10.13130/AWIN\_SHEEP\_2015.

BERGER Y., BILLON P., BOCQUIER F., CAJA G., CANNAS A., MCKUSICK B., MARNET P.G., THOMAS D.L. 2004. Principles of sheep dairying in North America. University of Wisconsin-Madison, UW Extension, WI, USA, 156 pp.

BUXADÉ C. 1996. Zootecnia. Tomo VIII: Producción ovina, 381 pp.; Tomo IX: Producción caprina, 336 pp. Mundi-Prensa, Madrid.

CAÑEQUE V., RUIZ DE HUIDOBRO F., DOLZ J.F., HERNÁNDEZ J.A. 1989. Producción de carne de cordero. MAPA, Secretaría General Técnica, Colección Técnica, Madrid, 520 pp.

DAZA A. 2002. Mejora de la productividad y planificación de explotaciones ovinas. Ed. Agrícola española, Madrid. 232 pp.

DAZA A. 2004. Ganado caprino: Producción, alimentación y sanidad. Ed. Agrícola española, Madrid. 232 pp. 312 pp.

FAHMY M.H. 1996. Prolific sheep. CAB Internacional, Oxon, UK, 542 pp.

FERRER L.M., GARCÍA DE JALÓN J.A., DE LAS HERAS M. 2002. Atlas de patología ovina. Editorial Servet, Zaragoza.

FRASER A., STAMP J.T. 1989. Ganado ovino: producción y enfermedades. Mundi-Prensa, Madrid, 358 pp.

FREER M., DOVE H. 2002. Sheep nutrition. CABI Publishing, Oxon, UK, 436 pp.

GALLEGO L., TORRES A., CAJA G. 1994. Ganado ovino: raza Manchega. Mundi-Prensa, Madrid. 430 pp.

HARESIGN W. 1983. Sheep production. Butterworths, London, UK, 576 pp.

INRA, 2010. Alimentation des bovins, ovins & caprins. Editions Quae, Versailles, 315 pp.

LAZZARONI C., GIGLI S., GABIÑA D. 2007. Evaluation of carcass and meat quality in cattle and sheep. Wageningen Academic, Wageningen, The Netherland.

MARAI I.F.M., OWEN J.B. 1987. New techniques in sheep production. Butterworths, London, UK, 292 pp.

PULINA G. 2004. Dairy sheep nutrition. CAB International, Wallingford, Oxfordshire, UK, 228 pp.

QUITTET E. 1990 La cabra: Guía práctica para el ganadero. Mundi-Prensa, Madrid, 318 pp.

RADOSTITS O.M., GAY C.C., HINCHCLIFF K.W., CONSTABLE P.D. 2007. Veterinary Medicine: A textbook of the diseases of cattle, horses, sheep, pigs and goats. Saunders. USA

### Links:

Link with the European Commission's Directorate- General for Agriculture and Rural Development .

<http://ec.europa.eu/agriculture/>

Link with the European Food Safety Agency.

<http://www.efsa.europa.eu/>

Link the Area of Livestock of the Page of the Ministry of Agriculture, Food and Medio Ambiente .

<http://www.magrama.gob.es/es/ganaderia/temas/default.aspx>

Link to the Catalan Food Safety Agency.

<http://www.gencat.cat/salut/acsa/>

## **Software**

### THEORY PROGRAM

#### Unit I. Production of small ruminants

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Subject 4. The production of meat and wool : Production schedule for meat sheep: seasonal and out of season. Wool production. Productive calendar for meat goats. Natural and artificial lactation. Production of lambs. Weaning. Lamb fattening. Characteristics and assessment of the carcasses: milky, light and heavy. Fattening facilities. Breeding stock replacement for sheep and goats.

Subject 5. Milk production : Production calendar for dairy sheep: seasonal and out of season. Lactation curve and milking equipment for sheep. Productive calendar for dairy goats and productive particularities. Trough health and milk quality. Production costs.



Subject 6. The feeding of small ruminants : Nutritional needs of sheep and goats. Voluntary ingestion. Body reserves. Forage calendars and feed available. Feed strategies. Rationing of sheep and goats by the INRA system.

#### Unit II. Health of small ruminants

Subject 7. Disease control and preventive measures: Diagnosis, prevention, and control of the main diseases: abortions, diarrhoea in young and adult sheep and goats, respiratory diseases, trough diseases.

Subject 8. Health planning of the flocks : Health control plans for the main diseases in sheep and goats.

Subject 9. Study of health problems : Specific cases of disease in small ruminants.

#### Unit III. Welfare and sustainability of small ruminant farms

Subject 10. The facilities : Facilities for sheep and goat herds: meat production and milk production. Needs of animals and design of farms.

Subject 11. Sustainability in small ruminant farms : Concept of sustainability. Impact of small ruminant farms on the environment. Productive alternatives: organic production

Subject 12. Indicators and protocols for assessing the welfare of sheep and goats : Indicators and protocols for assessing the welfare of sheep and goats. Main problems that can affect the welfare of these species

Subject 13. Welfare of sheep and goats : Discussion of a specific welfare problem in a sheep / goat farm.

#### Unit IV. Case Study and Case report.

CASE REPORT based on real data from a farm :

- Comprehensive planning and improvement of a small ruminant farm: after collecting information on production, health and welfare of a small ruminant farm, an analysis will be made of it, identifying the critical points, and proposing an improvement plan of the different aspects.

BIBLIOGRAPHICAL REVIEW WORK:

- Research work or technical study: published in an indexed research journal or other sources, which allows the students to evaluate various problems in the sector and measures to be applied.

In teams of **2-3 students**, and must be presented and discussed at a seminar.

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1.2 Assessment of welfare (1 h) : Application of welfare assessment protocols on the UAB farm.

1.3 Collection of health information (1 h) : Health status of the herd and problems detected on the UAB farm.

1.4. Attention of parts (2 h) : As far as possible, birth supervision with assistance to sheep and / or goats and new-borns.

##### 2. Computer practices (2 h)

2.1. Calculation of rations for sheep and goats (2 h) : Nutritional needs. Food valuation. Spreadsheets. Use of the INRAtion program for goats and sheep. Fattening lambs.

### 3. Health seminars (6 h)

3.1. Presentation of the situation of a herd, of the sector, or of external clinical cases in ovine and goat health (2 h) : Presentation and discussion of various productive and health cases by a farmer, veterinarian, or person in the sector: production, welfare and health problems in current daily practice and how to address them.

3.2. Discussion and Evaluation of Clinical Cases (2h) : Debate on how to approach the diagnosis of the different CLINICAL CASES and their resolution by the students in small groups, previous explanation in classroom (Subject 9) of different cases received in the service of necropsies and infectious diseases.

3.3. Presentation of current issues in sheep and goat health (2 h) : Presentation and discussion of current issues in research in sheep and goat health.