



Universitat de Lleida

DEGREE CURRICULUM

# **FOOD AND ANIMAL BREEDING**

Coordination: DE LA FUENTE OLIVER, GABRIEL

Academic year 2020-21

## Subject's general information

<b>Subject name</b>	FOOD AND ANIMAL BREEDING			
<b>Code</b>	102550			
<b>Semester</b>	1st Q(SEMESTER) CONTINUED EVALUATION			
<b>Typology</b>	Degree	Course	Character	Modality
	Bachelor's Degree in Agricultural and Food Engineering	3	COMPULSORY	Attendance-based
<b>Course number of credits (ECTS)</b>	6			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	PRALAB	PRAULA	TEORIA
	<b>Number of credits</b>	1	1	4
	<b>Number of groups</b>	1	1	1
<b>Coordination</b>	DE LA FUENTE OLIVER, GABRIEL			
<b>Department</b>	ANIMAL HUSBANDRY			
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
DE LA FUENTE OLIVER, GABRIEL	gabriel.delafuente@udl.cat	2,8	
SERADJ , AHMAD REZA	reza.seradj@udl.cat	,2	
VILLALBA MATA, DANIEL	daniel.villalba@udl.cat	3	

## Learning objectives

The student, on passing the subject, must be able to:

- Demonstrate theoretical and practical knowledge about animal feed.
- Know how to use basic methodologies and instruments of an animal feed laboratory. Describe the stages in which food is used by animals. From ingestion to obtaining the final product.
- Analyze and formulate rations for animals.
- Identify the goals and stages of an animal breeding program.
- Describe the basics of the species improvement program for livestock. Know how to manage the acquisition or replacement of players with genetic criteria.
- Development of autonomous student learning and transversal skills such as the ability to integrate and teamwork.

## Competences

General skills

At least the following basic competencies must be guaranteed:

CG1: That students have demonstrated knowledge and understanding from the basis acquired in their previous studies at a level that, while supported by advanced textbooks, also includes aspects that involve knowledge from the avant-garde of this discipline.

CG2: That students know how to apply their knowledge to their work in a professional way and possess the skills they usually demonstrate through the development and defense of arguments and problem solving within their area of study.

CG3: That students have the ability to gather and interpret data and make judgments that include reflection on relevant issues of a social, scientific or ethical nature.

CG4: That students can convey information, ideas, problems and solutions to both specialized and non-specialized audiences.

CG5: That students should develop the learning skills necessary for undertake further studies with a high degree of autonomy.

In addition the graduate must be able to:

CG6: Analyze specific situations, define problems, make decisions and implement action plans in search of solutions.

CG9: Use existing computer and communication tools as support for the development of their professional activity (UdL strategic competence)

CG11: Understand and express themselves with the appropriate terminology.

CG12: Present correctly information orally and in writing (strategic competence

UdL)

## Specific skills

The graduate in Degree in Agricultural and Food Engineering after completing his studies will have acquired the following knowledge and skills:

CEFB8. Knowledge of the biological bases and foundations of the animal field in engineering.

CEMC3 The Basics of Animal Feeding and Genetic Improvement.

CG11 Capacity and mastery of information and communication technologies.

CE2 Knowledge and use of animal production technologies. Animal production, protection and exploitation systems. Genetics and animal breeding.

## Subject contents

### ANIMAL FEEDING BLOCK (16h)

Module 1. Nutrient metabolism. Anabolism and catabolism. Metabolic efficiency. Metabolism of nutrients obtained from the digestion of carbohydrates, lipids and proteins. Metabolic aspects that affect the production of different animal products (3h)

Module 2. Energy balance. Definition of all inputs and outputs. Main methods for estimating the main inputs and outputs. Factors affecting the energy balance (2h)

Module 3. Protein assessment. Dynamics of the rumen. Degradability. Microbial protein. Protein evaluation index. Limiting amino acids. Availability of amino acids. Ideal protein (2h)

Module 4. Systems of assessment and calculation of energetic needs for ruminants. Classical methods. Energy valuation of food. Calculation of energy needs (2h)

Module 5. Systems of assessment and calculation of protein needs for ruminants. Classical methods. Protein evaluation of foods. Calculation of protein needs (2h)

Module 6. Systems of valuation and calculation of needs for monogastric. System for monogastrics. Food assessment and needs calculation. (2h)

Module 7. Food consumption. Ingestion capacity. Factors affecting ingestion regulation. (1h)

Module 8. Water. Water functions. Water quality and balance. Factors affecting water needs and consumption. (1h)

Module 9. Vitamins and minerals. Functions and classification. Main sources and factors that affect the needs of the animal. (1h)

## ANIMAL IMPROVEMENT BLOCK (4pm)

Module 1. Programs and schemes of improvement. Organizations involved in improvement schemes. Differences between species. (2h)

Module 2. The objectives of selection. Definition of selection objective. Calculation of economic weights for different characters. Selection objectives in different species. (2h)

Module 3. Schemes of improvement in little prolific species (2h)

Module 4. Schemes of improvement in prolific species (2h)

Module 5. Genetic management in little prolific species. (2h)

Module 6. Genetic management in prolific species. (2h)

Module 7. Biotechnology and Animal Improvement. Molecular markers. Selection assisted by markers. Older people and QTL: main examples in production animals (2h)

Practical activities

COMPUTER CLASSROOM PRACTICES

- Rationing practices for ruminants and monogastrics (2h)

## PROBLEMS AND CASES

- Solving an energy balance case. (2h)
- Solving problems of assessment of needs and food inputs. (2h)

## SEMINARS

- Animal feeding seminar (2h)
- Genetic improvement seminar (4h)

## VISITS

- Visit to genetic selection centers in beef and dairy sheep (5h)

## Development plan

All sessions will be held in person, virtually or semi-in person according to the recommendations, regulations or restrictions of the health authorities.

## Evaluation

Type of activity	Evaluation activity		Weight qualification
	Procedure	Number	(%)
Master class	Written tests on the theory of the syllabus of the subject	4	60
Problems and cases	Deliveries or Tests writings on problems and cases	1	5
<b>Seminars</b>	Written or oral tests	1	10
<b>Lab work</b>	Delivery of reports. Written or oral tests	1	10
<b>Computer work</b>	Delivery of reports. Written or oral tests	2	10
Field work	Delivery of reports. Written or oral tests		
<b>Visits</b>	Delivery of reports. Written or oral tests	1	5
Directed activities	Delivery of work		
<b>Total</b>		<b>10</b>	<b>100</b>

## Observacions

To pass the assessment it is essential to obtain at least 4/10 in the set of theoretical tests (master class) (with a

minimum of 3.5 / 10 in each individual test). In the final examination, the suspended parts will be recovered.

## Bibliography

### Basic bibliography

ALFONSO, L. y ESTANY, J. (1996). Organización y esquemas de mejora animal. Universitat de Lleida

BUXADÉ, C. (1995) (Coord.). Zootecnia: bases de producción animal. Tomo II: Reproducción y Alimentación. Mundi-Prensa. Madrid.

BUXADÉ, C. (1995) (Coord.). Zootecnia: bases de producción animal. Tomo III: Alimentos y Racionamiento. Mundi-Prensa. Madrid.

BUXADÉ, C. (1995) (Coord.). Zootecnia: bases de producción animal. Tomo IV: Genética, patología higiene y residuos animales. Mundi-Prensa. Madrid.

DE BLAS, C, GONZALEZ, G, ARGAMENTERIA A, (1987). Nutrición y alimentación del ganado. Mundi-Prensa. Madrid.

McDONALD, P, EDUARDES, R.A. y GREENHALGH, J.F.D. (1985). Nutrición animal. Ed. Acribia. Zaragoza.

### Further reading

BOWMAN, J.C. (1982). Introducción a la mejora animal. Omega. Barcelona. DALTON, D.C. (1982). Introducción a la genética animal práctica. Acribia, Zaragoza.

FEDERACIÓN ESPAÑOLA PARA EL DESARROLLO DE LA NUTRICIÓN ANIMAL (2003). Tablas FEDNA de composición y valor nutritivo de alimentos para la fabricación de piensos compuestos (2ª edición). Disponible a Internet: <http://www1.etsia.upm.es/fedna/tablas.htm>.

INRA (2008). Alimentation des bovins, ovins et caprins. Besoins des animaux – Valeurs des aliments. Ed. Quae. París.

LAZARO, R. Y MATEOS, G.G. (2008). Necesidades nutricionales para avicultura. Normas

FEDNA. Asociación Española de Ciencia Avícola (sección Española de la WPSA).

LEGATES, J.E. y WARWICK, E.J. (1992). Cría y mejora del ganado. Ed. Interamericana. McGraw-Hill, México.

NRC (1998). Nutrient requirements of swine. National Academy Press. Washington D.C.