

## COURSE DESCRIPTION

### COURSE DETAILS

Title (of the course): **NUTRICIÓN Y ALIMENTACIÓN ANIMAL**

Code: 101485

Degree/Master: **GRADO DE VETERINARIA**

Year: 5

Name of the module to which it belongs: PRODUCCIÓN ANIMAL

Field: NUTRICIÓN Y ALIMENTACIÓN ANIMAL

Character: OBLIGATORIA

Duration: FIRST TERM

ECTS Credits: 6.0

Classroom hours: 60

Face-to-face classroom percentage: 40.0%

Study hours: 90

Online platform: <http://moodle.uco.es>

### LECTURER INFORMATION

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### PREREQUISITES AND RECOMMENDATIONS

#### Prerequisites established in the study plan

Students must hold B1 English level.

#### Recommendations

It is recommended to have passed the subjects: Biochemistry, Agriculture, Animal Physiology, and Animal Production and Veterinary Hygiene.

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### INTENDED LEARNING OUTCOMES

CE55

CE56

### OBJECTIVES

1. To know the fundamentals of Animal Nutrition and Feeding and their role in the professional practice of veterinarians.
2. To evaluate the chemical and nutritional composition of feeds.
3. To understand the origin and evaluation of the nutritional requirements of animals of veterinary interest.
4. To study the characteristics of raw materials and common additives.
5. To apply practical feeding recommendations according to the species, physiological state, and production (quantity and quality).
6. To design and evaluate diets and rations.
7. To become familiar with feed manufacturing (processes and regulations) and the tasks of the veterinarian responsible for the feed factory.
8. To introduce research in Animal Nutrition and Feeding, with special emphasis on the effects of feeding on the animal welfare-health binomial, the quality of animal-derived products, and the environmental impact of livestock farming.

### CONTENT

#### 1. Theory contents

**I. Animal Nutrition.** Introduction. Research in Animal Nutrition and Feeding. Composition of feeds. Analytical methods. Digestion of feed and nutrient metabolism in animals of veterinary interest. Nutritional assessment of feed. Systems for assessing energy, protein, carbohydrates, and minerals. Origin of nutritional requirements of animals.

**II. Feed ingredients.** Chemical, nutritional, and technological characteristics of raw materials. Use of additives. Feed processing methods and use of enzymes.

**III. Animal feeding.** Nutritional requirements of animals based on species, physiological state, and production level. Particularities of feeding in each of the animal species of veterinary interest.

**IV. Feed manufacturing technology.** Processes and machinery in the feed factory. Applicable regulations. Traceability. Hygiene. Labelling.

#### 2. Practical contents

1. Identification of feeds: 4.5 contact hours. Identification of common raw materials in Animal Feed. Differentiation of common presentations of compound feeds and the species they are intended for, according to those presentations.
2. Study of cases of poor nutrition: 5 contact hours. Writing and presentation of a case of poor nutrition in farm or companion animals. The case must be real, obtained from farmers or veterinarians in the exercise of their profession.
3. Design and formulation of feeds: 6 contact hours. Use of a linear programming feed formulation program at minimum cost. Choice of appropriate raw materials and additives according with the presentation of the feed and the type of animal it is intended for.
4. Evaluation of diets and rations: 6 contact hours. Calculation of the energy provided by a feed based on the data declared on the label. Comparison of label values with recommendations from the literature. Evaluation of the suitability of a given ration to meet the nutritional needs of a particular animal or group of animals.
5. Methods of feed analysis: 2.5 contact hours. Techniques and equipment used in common analyses in Animal

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Feeding.

6. Labelling of animal feeds: 3 contact hours. Knowledge of the mandatory and optional information that appears on animal feed labels, according to current regulations. Preparation of labels based on feed formulas.

## SUSTAINABLE DEVELOPMENT GOALS RELATED TO THE CONTENT

No poverty

Zero hunger

Good health and well-being

Responsible consumption and production

Climate action

## METHODOLOGY

### General clarifications on the methodology (optional)

The **theory classes** will be taught according to the established schedule and in the classrooms assigned by the Center. They will last 50 minutes and will consist of lectures accompanied by ad hoc PowerPoint presentations. Student participation will be encouraged through questions posed by the teacher at the most relevant points. Student questions will be answered on the spot and at the end of the class.

**Practical sessions** will be held during the time slot established by the Center and in the premises of the Animal Production Building. The duration and distribution of the sessions will be made with the criterion of favoring the choice of group by the students, avoiding fatigue, and facilitating learning by repetition. Depending on the type of practice, presentations and other support materials, individual computers, blackboards, samples of raw materials and compound feeds, etc. will be used. During the sessions, student participation and cooperative learning will be encouraged.

**Tutorials** will be conducted in-person, on days and at a time agreed upon between the student and the teacher, via email, or through the messaging service of the Moodle platform.

### Methodological adaptations for part-time students and students with disabilities and special educational needs

The required methodological adaptations will be taken into account and in accordance with current regulations for part-time students and students with disabilities and special educational needs.

### Face-to-face activities

Activity	Large group	Medium group	Small group	Total
Lab practice	-	-	22	22
Lectures	33	-	-	33
Seminar	-	5	-	5
<b>Total hours:</b>	<b>33</b>	<b>5</b>	<b>22</b>	<b>60</b>

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### Off-site activities

Activity	Total
<i>Exercises</i>	5
<i>Information search</i>	10
<i>Reference search</i>	15
<i>Self-study</i>	60
<b><i>Total hours</i></b>	<b><i>90</i></b>

## WORK MATERIALS FOR STUDENTS

Coursebook  
Dossier  
Exercises and activities  
Oral presentations  
Placement booklet  
References

### Clarifications

All the material will be made available to students in the designated area for the subject on the Moodle platform of the University of Cordoba. The presentations for the theoretical lessons will be available in pdf format during the same week they are taught. Additionally, students will have access to a comprehensive manual with all the theoretical contents of the subject from the beginning of the course. Likewise, students will have self-assessment questionnaires for each of the lessons available to them. The manual for the practical sessions will be also available from the beginning of the course.

## EVALUATION

Intended learning	Case Studies	Exams	Real and/or simulated tasks
<i>CE55</i>	X	X	X
<i>CE56</i>	X	X	X
<b><i>Total (100%)</i></b>	<b><i>10%</i></b>	<b><i>55%</i></b>	<b><i>35%</i></b>
<b><i>Minimum grade</i></b>	<b><i>5</i></b>	<b><i>5</i></b>	<b><i>5</i></b>

(\*)Minimum mark (out of 10) needed for the assessment tool to be weighted in the course final mark. In any case, final mark must be 5,0 or higher to pass the course.

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### Method of assessment of attendance:

The grade obtained in the theoretical content exam will increase by 10%, provided that the grade is equal to or greater than 5 and the number of attendances is equal to or greater than 75% of the theoretical sessions.

### General clarifications on instruments for evaluation:

The **final exam for the theoretical content** may be either a multiple-choice test or short answer questions. If the exam is a multiple-choice test, it will have questions corresponding to the four subject blocks defined in the "Contents" section. To pass the exam, it will be necessary to pass each block separately with a minimum grade of 5. If this requirement is met, the exam grade will be the arithmetic mean of the grades obtained in each of the blocks. If the exam is of short answers, the grade will be the sum of the points obtained in each question based on a scale of 10, with a minimum grade of 5 required to pass.

The **evaluation of the knowledge acquired in the practical sessions** of Feed Recognition, Feed Design and Formulation, Diet and Ration Evaluation, Feed Analysis Methods and Animal Feed Labelling will be carried out at the end of the course through corresponding simulation exercises of real tasks. To achieve the required minimum grade of 5, it will be necessary to correctly complete at least 90% of the proposed exercise in each practical session. In the Case Studies of Poor Nutrition practice, the interest of the presented case, the quality of the presentation, the oral exposition, and the ability to respond to the questions posed by the teacher and classmates will be evaluated, with a minimum grade of 5 required to pass. Failure to attend all sessions of each practical session on the groups and days specified in the Moodle platform will automatically result in a "Fail" grade for that practice, with no possibility of exam except under exceptional circumstances. The grade of approved practical sessions will be kept indefinitely until the remaining parts of the course are passed. Once all practical sessions have achieved the required minimum grade, the total grade for the practical part will be the weighted average (according to the duration of each practical session compared to the total duration of the practical sessions) of the grade obtained in each practical session.

Once all theoretical and practical tests have achieved the required minimum grade of 5, the **final grade for the course** will be the weighted average of the theoretical part (55%) and the grades obtained in each practical session separately (45% in total).

### Clarifications on the methodology for part-time students and students with disabilities and special educational needs:

Specific learning conditions will be provided for part-time students and students with disabilities and special educational needs.

### Clarifications on the evaluation of the extraordinary call and extra-ordinary call for completion studies:

In extraordinary calls, the exam will be a multiple-choice test and will have questions grouped according to the four blocks of the subject, defined in the "Contents" section. To pass the exam, it will be necessary to pass each of the blocks separately with a minimum grade of 5. If this requirement is met, the grade for the exam will be the arithmetic mean of the grades obtained in each of the blocks. In these calls, it will also be possible to recover the practices carried out but not approved at the time, requiring a minimum grade of 5 to pass each practice. The final grade for the subject will be the weighted average of the grade for the theoretical part (55%) and the grades obtained for each of the practices separately (45% in total).

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### Qualifying criteria for obtaining honors:

*The global mark should be higher than 9.5 out of 10.*

## BIBLIOGRAPHY

### 1. Basic Bibliography

#### 1. General

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- Dryden, G. M. (2008). Animal nutrition science. CABI Press, Wallingford, United Kingdom.
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- Rook, J. A. F., & Thomas, P. C. (1989). Fisiología de la nutrición de los animales domésticos. Editorial Continental, México D.F., México.
- Tisch, D. A. (2006). Animal feeds, feeding and nutrition, and ration evaluation. Thomson Delmar Learning, Clifton Park, NY, United States of America.

#### 2. Complementaria General

- Adams, C. (2008). Nutrition-based health: Nutricines and nutrients, health maintenance and disease avoidance. Nottingham University Press, Nottingham, United Kingdom.
- AWT (2002). Enzymes in animal nutrition. German Animal Feed Additives Association, Bonn, Germany.
- AWT. (2004). Probiotics in animal nutrition. German Animal Feed Additives Association, Bonn, Germany.
- CVB. (2016). Chemical composition and nutritional values of feedstuffs. Federatie Nederlandse Diervoederketen, Wageningen, The Netherlands.
- FEFANA. (2014). Amino acids in animal nutrition. European Association of Specialty Feed Ingredients and their Mixtures, Brussels, Belgium.
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#### Por especies

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- AFRC. (1998). The nutrition of goats. Technical committee on response to nutrients. Report number 10. CAB International, Wallingford, Oxon, United Kingdom.
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- CSIRO. (2007). Nutrient requirements of domesticated ruminants. CSIRO Publishing, Collingwood, Australia.
- Ellis, A. D., Longland, A. C., Coenen, M., & Miraglia, N. (2010). The impact of nutrition on the health and welfare of horses. 5th European Workshop Equine Nutrition. Wageningen Academic Pub., Wageningen, The Netherlands.
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United States of America.

NRC. (2016). Nutrient requirements of beef cattle, 8th revised edition. National Academies Press, Washington DC, United States of America.

Saastamoinen, M., & Martin-Rosset, W. (2008). Nutrition of the exercising horse. EAAP Publication (Vol. 125). Wageningen Academic Publishers, Wageningen, The Netherlands.

### **Tecnología de la fabricación, trazabilidad y etiquetado**

AFIA (1994). Fed manufacturing technology IV. American Feed Industry Association, Arlington, United States of America.

CESFAC. 2005. Guía de aplicación del sistema de análisis de peligros y de puntos críticos de control en la industria de fabricación de piensos. Fundación CESFAC, Madrid, España.

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Payne, J., Rattink, W., Smith, T., & Winowski, T. (2001). The pelleting handbook. Borregaard Lignotech, Sarpsborg, Norway.

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## 2. Further reading

### Histórica

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Armsby, H. P. (1917). The nutrition of farm animals. Macmillan, New York, United States of America.

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## COORDINATION CRITERIA

Tasks performance

## SCHEDULE

Period	Lab practice	Lectures	Seminar
1# Week	4,5	2,0	0,0
2# Week	6,0	2,0	0,0
3# Week	2,5	2,0	0,0



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Period	Lab practice	Lectures	Seminar
4# Week	6,0	2,0	0,0
5# Week	3,0	2,0	0,0
6# Week	0,0	2,0	0,0
7# Week	0,0	2,0	0,0
8# Week	0,0	2,0	0,0
9# Week	0,0	2,0	0,0
10# Week	0,0	3,0	0,0
11# Week	0,0	3,0	0,0
12# Week	0,0	3,0	0,0
13# Week	0,0	3,0	2,5
14# Week	0,0	3,0	2,5
<b>Total hours:</b>	<b>22,0</b>	<b>33,0</b>	<b>5,0</b>

The methodological strategies and the evaluation system contemplated in this Course Description will be adapted according to the needs presented by students with disabilities and special educational needs in the cases that are required.