Animal Nutrition

Code: 102626
ECTS Credits: 6

2025/2026

Degree	Type	Year
Veterinary Medicine	OB	2

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

It is advisable to have passed the subject of Animal and Cell Biology, Biochemistry, Agronomy and Agrarian Economy, Bases of Animal Production and Management.

Objectives and Contextualisation

It is a compulsory subject in the second-year course of the Veterinary degree. The main objective is to introduce the student to the principles of nutrition and animal nutrition through a global and inclusive vision of biochemistry and physiology of the main domestic species.

The welfare, health and productivity of animals depend to a large extent on the exchanges of material and energy they do with the outside environment through the food. Humans participates in the selection of these foods and in the formulation and manufacture of the rations to be administered. This is especially relevant in livestock production, but also apply to companion animals. In this subject we study aspects related to the structure and analysis of food, its digestion, metabolism, and nutritional value. We also review different concepts that determine the nutritional requirements of the different animal species.

The course also aims to train the students in the basic principles of quantitative nutrition, addressing the minimum conceptual environment needed to interpret the information available on the subject. Particularly they will be trained in the nutritional evaluation of foods and the nutritional requirements of the animals (Use of Tables). Through different case-studies and exercises, the student will face the challenge of advising or making decisions about an adequate feeding of animals.

Therefore, the objectives of the course include:

1 - To understand and to know the importance of nutrients in the health and performance of animals; making an appropriate use of the terminology.

2 - To know the different procedures to calculate the nutritional value of the food and the nutritional requirements of domestic animal species, as well as all the factors able to modify them.

3 - To know the basic principles for feed formulation for domestic animals.

Competences

- Analyse, synthesise and resolve problems and make decisions.
- 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.
- Properly evaluate the nutritional status of animals and know how to advise others on breeding and feeding principles.
- Seek and manage information related with professional activity
- Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

Learning Outcomes

1. Analyse, synthesise and resolve problems and make decisions.
2. Classify nutrients and food additives by their nutritious importance and integrate their assimilation processes in the animal organism.
3. Communicate information obtained during professional exercise in a fluid manner, orally and in writing, with other colleagues, authorities and society in general.
4. Evaluate the main methodologies used to analyse feedstock and fodder.
5. Formulate rations for animals in the most conventional situations.
6. Identify the main types of feedstock and classify them by their utility for animal feeding.
7. Seek and manage information related with professional activity
8. Use current feeding systems: Know how to obtain the nutritious value of foodstuffs and calculate animals' nutrition requirements.
9. Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

Content

THEORY

Presentation of the subject (1 h TE)

Presentation of the Animal Nutrition discipline. How animals obtain and use food, energy and nutrients. Essentials and particularities in the nutrition of pets and livestock. How we will work in this subject.

Unit 1. Energy. (7 h theory + 3 h problems)

1. Introduction to bioenergetics. (1 h TE)

Types of energy. How animals use the energy: basal and fasting metabolism, thermoregulation, exercise, work, deposit in organic tissues.

2. Carbohydrates as a source of energy. (2 h TE)

Chemical composition, classification and analysis methods. Characteristics of carbohydrate digestion and metabolism in monogastric and ruminant animals.

3. Lipids as a source of energy. (2 h TE)

Chemical composition, classification and analysis methods. Characteristics of digestion and metabolism in monogastric and ruminant animals. Impact on body composition.

4. Energy assessment. (1 h TE + PN1 + PN2 + PN3)

Concept of gross energy. Partition of the energy within the animal: Digestible Energy, Metabolizable Energy and Net Energy. Introduction to the different feeding systems.

5. Main energy sources in the ration (raw materials). (1 h TE)

Cereals, forages, fats and oils. Impact of the processing and thermal treatments on digestibility and energy use.

Unit 2. Protein. (6 h theory + 2 h problems)

6. Introduction to the unit. (1 h TE)

What are proteins. Why animals need to ingest protein and amino acids. Protein turnover and protein requirements. Impact of dietary protein on the environment.

7. Proteins. (2 h TE)

Composition and classification. True protein and non-protein nitrogen. Essential amino acids and limiting aminoacids. Digestion and metabolism of proteins in monogastric and ruminant animals.

8. Protein value of foods. (2 h TE + PN4 + PN5)

Protein value for monogastric animals: crude protein and digestible protein. Concept of biological value of proteins. Total, digestible and available amino acids.

Protein value for ruminants: Concept of digestible protein in the intestine. Estimation of the effective degradability of dietary protein. Nylon bags method: degradation curves and rate of passage. Synthesis of microbial protein: efficiency of synthesis. Digestibility of the protein in the duodenum.

9. Main sources of protein in the diet (raw materials): (1 h TE)

Sources of vegetable origin: legumes, oilseed meals and expellers, vegetable protein concentrates.

Sources of animal origin: meat and fish meal, dairy ingredients, other ingredients of animal origin. Legislation.

Impact of the technological process on nutritional and microbiological quality.

Unit 3. Making a ration. (12 h theory + 8 h problems)

10. Introduction to the unit. (1 h TE)

Different steps when making a ration: Obtaining information. Management and interpretation of the tables (feeding regulations). Formulation methods. Introduction to linearprogramming. Preparation, manufacture and administration of the ration.

11. Voluntary intake (1 h TE)

Control mechanisms of voluntary intake: physical and metabolic theories. Factors that can modify voluntary intake. Energy concentration of diet and feed intake: regulation intervals in different species. Impact of

environmental temperature: winter and summer diets. Methods of predicting voluntary feed intake. Control of satiety: hypocaloric diets in the control of obesity.

12. Water and minerals (2 h TE)

Roles of water in the animal organism and water requirements in health. Factors that modify water requirements. Replenishment of body water: drinking water and metabolic water. Consumption and quality of water in the farm: practical aspects. Definition and classification of minerals. Basic functions and aspects the metabolism. Requirements and recommendations in some practical feeding situations.

13. Feed dditives. (1 h TE + SNA1 (2h seminar-additives))

Legal definition of additives. Registration process in Europe (EC-EFSA). Categories of additives: technological, sensory, nutritional, zootechnical, cocciidiostaticos. Vitamin-mineral supplements and pre-mixes. Introduction to the activity: Seminars of additives.

14 . Nutritional requirements for maintenance and exercise. (1 h TE + PN6 + PN7)

Introduction to the assessment of nutrient requirements: Minimum requirements and recommendations. Methodologies to estimate the needs of a nutrient: response curves and the factorial approach.

Assessment of requirements for maintenance: Concept of metabolic live weight and estimation of basal metabolism. Energy cost of thermoregulation and muscle activity. Energy metabolism in sport. Endogenous nitrogenlosses and estimation of protein requirements.

15. Nutritional needs for growth. (1 h TE + PN8 + PN9)

Change in the body composition with growth. Implications in the calculation of requirements. Modification of body composition through food and/or feeding practices. Protein deposition curves and estimation of energy and amino acid requirements based on the ideal protein concept. Requirements of by-pass protein in ruminants.

16. Nutritional requirements for reproduction and laying. (2 h TE + PN11)

Impact of feeding on puberty and fertility. Energy and protein needs during the period of rearing and service. Body condition score and reproduction. Feeding of the breeding sow and the milk cow.

Energy and amino acid requirements for the layers. Ca needs in the laying hen. Feeding for a higher egg quality: size, shell quality, yolk colour. Use of pigments.

17. Nutritional requirements for pregnancy and lactation. (2 h TE + PN10 + PN12 + PN13)

Deposit of nutrients during pregnancy in the uterus and mammary gland. Fetal nutrition Heat production during pregnancy. Anabolism of pregnancy. Pregnancy toxemia. Requirements for milk production. Mobilization strategies of energy during pregnancy / lactation. Strategy of the dog and the cat. Calculation of energy and protein requirements during pregnancy and lactation.

18. Feed manufacturing technology. (1 h TE)

Flow diagram of a feedmill. Reception and storage of raw materials. Grinding, dosing and mixing processes. Changes in the presentation of the feed: granulation and extrusion. Management of liquid ingredients. Coating. Packaging and transport of the finished product.

PRACTICES.

Practice 1. Food panel for pets (2 h PLAB).

Lab practice in which the student will become familiar to different commercial pet food presentations and different quality ranges. Students will learn how to read the labelling.

Practice 2. Analysis and composition of foods (2 sessions of 1.5 h PLAB).

This practice will be developed during two different days. It aims to improve the student's knowledge about the nutritional composition of raw materials commonly used in animal feeding. There will be considered the chemical analysis (methodologies of analysis and calculations of nutritive composition, interpretation of the obtained results) and also the microscopy of feed. Microscopy will not only allow the identification of the ingredients, but also to relate morphological traits with the chemical composition of the ingredients.

Practice 3. Nutrition Workshops. (3 sessions of 1.5 hour, SESP).

Throughout the course, 3 different workshops with will be done. Below it can be found examples of possible topics to be discussed:

Effect of feed processing on nutritional value.

Modifying milk composition through food.

Insects as a source of animal protein.

Feed management of horse.

Evaluation of nutritional status.

Make a right reading of the labelling of a pet-food.

Quality paramethers in pet-food: Ingredients of animal origin.

Trends in pet-food: Low-grain Diets. BARF Diets. Vegan Diets

How to reduce farm emissions through feeding strategies.

Heat stress. Summer diets in livestock.

Feeding strategies to improve egg quality.

Optimum Vitamin Nutrition Concept. Applications in livestock.

Design rations for non-conventional species.

Manage over-weight and obesity in pets.

Nutrition in sports: The sportive dogs.

Feeding management in large aquariums.

Pigmentation: Application in ornamental aquatic species and aquiculture.

Before the activity in the classroom, students will have to work in small groups of 4 people around one topic proposed by teacher and make a small summary of 1-2 pages (brief notes). This work will be supervised by the teacher. In the classroom, students will need to solve a specific problem related to a particular diet or feeding program. For that they will need to work in new teams formed by people who had previously worked on different topics (puzzle methodology). They will prepare a brief report in the classroom that will be used for the evaluation.

Practice 4. Problems sessions (13 sessions of 1 h of PAUL associated with the theory classes).

These PAUL sessions will be tightly associated to the hours of theory and they will be scheduled along the morning (the same time-slot than lecturers). In these sessions there will be solved different exercises aimed to help students to understand better the theoretical concepts presented in the lecturers (theory). During these sessions some of these exercises could be used for the evaluation.

Practice 5. Seminarsof feed additives (2 h SESP).

Students, in teams of 3-4 people, will have to solve a case-study regarding the registration of a new feed additive. Previous to the seminar, they will have to submit a brief written report to the teacher. In the sessions they will have to make an oral presentation in front of the rest of mates (within the demonstration group). Each seminar session will last two hours in which 5 different case studies will be discussed.

These seminars will allow the student to become familiar with the legislation, with the scientific browsers and to initiate themselves in the different families of feed additives.

Practice 6. Practices for the nutritive evaluation of diets and introduction to the feed formulation (3 sessions of 1.5 h and one session of 1 h. All PLAB in computer room).

These practices will include 3 different sessions in the computer room. First session will be devoted to the evaluation of homemade diets for dogs and cats (Balance-it program). The following two sessions will be an introduction to the feed formulation with the design of diets for dogs and poulty/layers (Linear formulation with the Winfeed program). The last forth session will consist of different exercises that the students will have to solve individually and that will be used for the evaluation.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes	26	1.04	4, 2, 5, 6, 8
Practicals	26	1.04	1, 4, 7, 2, 3, 5, 6, 9, 8
Seminars Feed Additives	2	0.08	1, 7, 2, 3, 9
Type: Supervised			
Tutorials for feed additives case-study	1	0.04	7, 2, 3, 9
Tutorials for Nutritional Workshops	1	0.04	4, 7, 2, 5, 6, 9, 8
Type: Autonomous			
Evaluation and formulation of diets	4	0.16	1, 3, 5, 6
Exercises Food Composition	2	0.08	4, 2, 6
Personal Study	47	1.88	4, 2, 5, 6, 8
Preparation of case-study of Feed Additives	9	0.36	7, 2, 3, 9
Reading and bibliographic search-Nutrition Workshop	10	0.4	1, 4, 7, 2, 5, 6, 9, 8
Solve exercises (problems)	17	0.68	1, 3, 8

TEACHING METHODOLOGY AND TRAINING ACTIVITIES.

The centre of the learning process is the student's work. The student learns by working, being the mission of the teacher to help him/her in this task (1) by supplying the students with information or by showing them how

to get it (2) re-directing their steps so that the learning process can be done effectively. In line with these ideas, and in accordance with the objectives of the subject, teaching will be based on the following methodologies and activities:

1. Work methods based on master classes.

The student acquires knowledge by attending master classes and complementing them with the personal study. The master classes are conceived as a fundamentally unidirectional method of transmitting teacher's knowledge to the student, although the participation of the student during this sessions will be encouraged.

2. Methods oriented to the discussion and / or teamwork.

Through cooperative learning the students increases their motivation and initiative, improve the degree of understanding and learning, promoting positive social relationships.

In particular the Nutrition Workshops will be taught following the Puzzle method in which the samestudents become tutors of the learning of their classmates while being tutored by them, producing a positive interdependence when working together. The students do not depend too much on the teacher, but rather they are the builders of their own learning.

2.1. Practices in the lab.

Food panel for pets (2 h)

Students will become familiar to differentcommercial foodsavailable for pet animals. They will get used to the different lines of products and will learn to read critically the labelling of the package.

Analysis and composition of foods (2 sessions of 1.5 h)

This practice will be developed during two different days. Its objective is to improve the knowledge regarding the nutritive composition of ingredients or raw materials used in animal feed.

There will be reviewed the different chemical analysis commonly used in feed analysis and also some basics on microscopy of feed. Microscopy will allow the identification of the ingredients, and also help students to relate morphological traits with the chemical characteristics of the ingredients.

2.2. Practices in the classroom.

Problem Sessions (13 sessions of 1 h, from them 2h will be used for evaluation)

Thirteen PAUL sessions of one hour will be programmed along the theory lecturers (TE). Before these sessions the students will need to work on a serie of exercises given by the teacher. The sessions in the classroom will addressed to solve doubts and answer questions. This part of the subject will be evaluated through small exercises solved in these classes. Also some exercises will be included in the written tests.

Nutrition Workshops (3 sessions of 1.5 h).

In this activity, the puzzle methodology will be used. Previously to the workshopt in the classroom the students will have to work in small groups of 4 people, on a particular topic suggested by the teacher (it is stimated 3 h of work per workshop). Different topics afforded by the different groups will be necessary to solve the problems that will be arised in the workshop. Before the session in the classroom, each small group will have to make a brief summary of 1-2 pages (like short notes) for the rest of mates to help them to solve the challenge. The teacher will supervise this material to amend possible errors. The day of the activity in the classroom students will have to solve an specific challenge normally related with an specific diet or feeding program. To solve this challenge new teams will be built in the classroom formed by people who have previously worked on different topics (puzzle methodology). They will prepare a brief report in the classroom that will be used for the evaluation

In this activity students will have to apply knowledge acquired along the lecturers and combine it with the search of complementary information using different sources. The students at the end of this activity should be

able to identify problems, make a diagnosis and search solutions. Moreover this activity is aimed to encourage critical analysis and capacity of discussion and communication of the students.

2.3. Practices in the computer room.

Nutritive evaluation of diets and introduction to the feed formulation (3 sessions of 1.5 h and one session of 1 h. All PLAB in computer room).

In the first session the nutritional assessment of homemade diets for dogs and cats will be carried out and in the followingtwo sessions there will be an introduction to the feed formulation with the help of the program Winfeed. With these practices it is pursued that the student will be able to make an assessment of the nutritional adequacy of a diet, identifying ingredients, nutrients and requirements of the animals and also become familiar with basic principles of lineal formulation.

2.4. Seminars.

Additive seminars (2 h).

Students, in teams of 3-4 people, will have to solve a case-study regarding the registration of a new feed additive. Previous to the seminar, they will have to submit a brief written report to the teacher. In the sessions they will have to make an oral presentation in front of the rest of mates (within the demonstration group). Each seminar session will last two hours in which 5 different case studies will be discussed.

These seminars will allow the student to become familiar with the legislation, with the scientific browsers and to initiate themselves in the different families of feed additives.

3. Autonomous work.

Autonomous work is a methodology focused primarily on the student, although the teacher also has a prominent role in this process. The objective that he pursues is to get the students to develop skills to establish their learning objectives, choose between different ways of learning, set their own pace, plan and organize their work, discover and solve problems, make decisions and evaluate their own progress. Autonomous learning fosters diverse transversal competences and becomes an essential teaching method. Within this subject different autonomous work activities are proposed.

Study.

The student is estimated to dedicate about 45 total hours of study in the subject.

Reading and bibliographic search - Nutrition Workshops.

For the activity of the Nutrition Workshops it is estimated that the student will dedicate 10 h..

Exercises of Analysis and composition of foods

Before the first practice of analysis and composition of foods, students should read the material provided by the teacher and solve a proposed exercise (2 hours).

Preparation of the case-study of additives.

A total of 9 hours is estimated for the bibliographic search and selection of the work, the preparation of the written report and the oral presentation.

Evaluation and formulation of diets

Associated to the practical sessions in the computer room, students will have to solve different exercises following the practicals book (4 h).

Resolution of problems.

With the support of the material provided by the teacher, and before and after the problem sessions, the students will have to work autonomously different exercises of the practicals book (17 h).

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.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation and formulation of diets	10%	1	0.04	2, 3, 5, 6, 8
Exercises (problems) solved in the classroom	10 %	2	0.08	1, 4, 8
Nutrition Workshops	10 %	0	0	1, 7, 6, 9, 8
Seminars Feed Additives	10%	0	0	7, 2, 3, 9
Written test Unit I and II	30 %	1	0.04	1, 4, 7, 2, 6
Written test Unit III	30 %	1	0.04	5, 6, 8

CONTINUOUS EVALUATION

For the assessment of the students the following methods of evaluation will be used:

- Written test Unit I and II (First term) (it includes concepts seen in lectures, practicals on analysis and composition of foods, nutrition workshops 1 and 2 and problems) 35%.

- Written test Unit III (Second term) (includes concepts seen in lectures, nutrition workshop 3 and problems) 35%.

- Nutrition Workshops (questions solved during the session) 10%.

- Problems solved in the classroom (bonus of the final grade up to a 10%).

- Exercises solved in practical session NA7-computer room 10%.

- Seminars on feed additives. The written document, the public defence of the case, and the participation in the discussion will be evaluated 10 %.

PASS THE SUBJECT

To pass the subject it will be necessary:

- Attendance to practices in the lab and in the computer room.

- To pass the two written tests with a minimum of 4/10 in each of them, and a minimum of 5/10 in the average of the two written tests.

- Pass the average global assessment with a minimum of 5/10

SINGLE ASSESSMENT (For those students who request it beforehand)

For the calculation of the final grade of the subject, the following qualifications will be taken into account:

- Single written test (includes concepts studied in theoretical classes, food analysis and composition practices, nutrition workshops 1, 2, and 3, and problems) 70%. This test will take place on the same date as the second written continuous assessment test.

- Nutrition Workshops (students will have to do an individual work for each of the workshops. The papers must be handed in on the same day as the written test of the single assessment) 10%.

- Feed formulation and evaluation, The students will have to present an individual work consisting of the formulation of a diet with the Winfeedsoftware and the evaluation of a diet with the BalanceIT software. The papers must be handed in on the same day as the written test of the single assessment, 10%.

- Additives seminar. Students will have to prepare an individual report on the effectiveness or safety of an additive using evidence from an indexed scientific publication. The papers must be handed in on the same day as the written test of the single assessment. 10%.

The same recovery system will be applied as for the continuous assessment.

The review of the final qualification follows the same procedure as for the continuous assessment.

(*Notes and attendance at Workshops, Additives Seminars and Ration Evaluation and Formulation can be saved for one year.)

PASS THE SUBJECT

To pass the subject it will be necessary:

- Assisting in laboratory practices NA1, NA2, and NA3.

- Pass the only written test of the single assessment with a minimum of 5/10.

- Pass the average global assessment with a minimum of 5/10

(*The marks from the Nutrition Workshops, Seminar on feed additives and from practicals in the computer room can be saved for one year).

NO AVALUABLE

Those students that had been evaluated in less than 60% of the potential final grade of the subject will be considered not avaluable.

EVALUATION OF TRANSVERSAL COMPETENCES.

CT1 (Analyze,synthesize, solve problems and make decisions)

- It will be assesed in the problems solved in the classroom (20% of the grade of this item).

- It will be assesed in Nutrition Workshops (50 % of the note of this item).

- The assesesment of this competence contributes in a 9 % of the final grade.

The CT2 (Work effectively in a team, uni or multidisciplinary, show respect, appreciation and sensitivity

In front the work of others)

- It will be assesed under the rubric of the Seminars of feed additives (20% of this item).

- The assesment of this competence contributes 2% in the final grade.

The CT4 (Communicate the information obtainedduring the professional exercise in a fluid, oral and written way, with other colleagues, authorities and society in general).

- It will be assesed with the rubric of the Seminars of feed additives (20% of the grade of this item).

- It will be assesed with the rubric of the formulation of diets (computer room) (20% of the note of this item).

- The assesment of this competence contributes 4% in the final grade.

CT6 (Search and manage information related to professional activity).

- It will be assesed with the rubric of the Seminars of feed additives (20% of the grade of this item).

- The assesment of this competence contributes 5% in the final grade.

The sum of the 4 transversal competences contributes to a 20 % of the final grade of the subject.

For this subject, the use of Artificial Intelligence (AI) technologies is allowed exclusively in support tasks, such as bibliographic or information search, text correction or translations. The student will have to clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how they have influenced the process and the final result of the activity. Non-transparency of the use of AI in this assessable activity will be considered a lack of academic honesty and may result in a partial or total penalty in the grade of the activity, or greater penalties in cases of seriousness

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- Voluntary Food Intake and Diet Selection in Farm Animals Eds: Forbes, JM, *et al.* (2007)

- Encyclopedia of Human Nutrition . Academic Press (2005)

Nutritional evaluation.

- Forage Evaluation in Ruminant Nutrition . Eds: Givens, DI, et al. (2000)

- Poultry Feedstuffs: Supply, Composition and Nutritive Value Eds: McNab, JM, et al. (2002)

- Mathematical Modeling in Animal Nutrition Eds: France, J., et al. (2008)

- Nutrient Digestion and Utilization in Farm Animals: Modeling Approaches Editor (s): Kebreab, E., et al. (2006)

- Quantitative Aspects of Ruminant Digestion and Metabolism Editor (s): Dijkstra, J., et al. (2005)

Nutritional requirements.

- Mineral nutrition of livestock. Eds: Suttle, N., et al. (2010)

- Phosphorus and calcium utilization and requirements in farm animals Ed: Vitti, DMSS, et al. (2010)

- Nutrient requirements and feeding of finfish for aquaculture Editor (s): Webster, CD, et al. (2002)

- Farm animal metabolism and nutrition . Eds (s): D'Mello, JPF (2000)

- The mineral nutrition of livestock. Underwood, EJ, et al. (1999)

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Animal feeding

- Nutrition of the rabbit . Editor (s):Blas, C. de, et al. (2010)

- Nutrition and feeding of organic poultry Eds: Blair, R., Et al. (2008)

- Nutrition and feeding of organic pigs. Eds: Blair, R., et al. (2007)

- Dairy sheep nutrition. Eds: Pulina, G., et al. (2004)

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- Dairy Goats Feeding and Nutrition . Eds: A.Canna and G. Pulina. Wallingford: CABI (2008)

WEBS DE INTERÈS

* Tablas FEDNA de Composición de Alimentos. Fundación Española para el Desarrollo de la Nutrición Animal.

http://www.fundacionfedna.org/tablas-fedna-composicion-alimentos-valor-nutritivo

* Normas FEDNApara la formulación de piensos.

http://www.fundacionfedna.org/node/75

* PubMed , is a service of the US National Library of Medicine that includes around 19 million citations of the

MEDLINE and other publications of Life Sciences. It is a good search engine to locate scientific articles published on very specific topics. http://www.ncbi.nlm.nih.gov/pubmed/

Software

BalanceIT, is a software (with restricted access to users) to evaluate the nutritional composition of diets for pets.

http://lab.balanceit.com/

WinFeed, is a software (with a free demo version) to formulate rations using linear and stochastic programming. I
http://www.winfeed.com/

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	1	Catalan/Spanish	second semester	morning-mixed

(PLAB) Practical laboratories	2	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	3	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	4	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	5	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	6	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	1	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	2	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	3	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	4	Catalan/Spanish	second semester	morning-mixed
(TE) Theory	1	Catalan/Spanish	second semester	morning-mixed
(TE) Theory	2	Catalan/Spanish	second semester	morning-mixed