

COURSE: **ANIMAL NUTRITION AND FEEDING**

ACADEMIC YEAR: **2016/2017**

TYPE OF EDUCATIONAL ACTIVITY: **Characterizing**

TEACHER: **DI TRANA ADRIANA C. L.**

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Language: **ITALIAN**

ECTS: (lessons e tutorials/practice) 8 ECTS lesson 1 ECTS tutorials/practice	n. of hours: (lessons e tutorials/practice) 64 hours lessons 16 hours tutorials/practice	Campus: Potenza Dept./School: Scuola di Scienze Agrarie, Forestali, Alimentari, ed Ambientali (SAFE) Program: Agricultural Technologies	Semester: Second
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EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course is the first and the only teaching of Animal Nutrition and Feeding and deals with the basic elements of the Animal Nutrition section and Animal Feeding section.

The first objective of the course is to give students the basic knowledge of nutrition and animal feeding and provide the right tools for the formulation of balanced rations for livestock.

The second objective is to provide students with all tools for the evaluation of feed and raw materials used in animal feed in order to ensure the welfare and health of the animal as well as the healthiness of animal's origin derived from them.

The main knowledge provided will be:

- Knowledge of the theoretical basis and the practices regarding classification, the chemical properties, physiological and nutritional assessment of feed for farm animals.
- Knowledge of principles and methods for evaluating the feed intake and the requirements of farm animals.
- Knowledge of feeding techniques for animal production.
- Basic knowledge for the formulation of balanced diets for animals with different production types.

The main skills will be:

- analyze the business environment concerning animal feeding management and feed management;
- identify the weaknesses and the strengths of the feeding management of different farm types;
- evaluate appropriate solutions to different types of farm, in order to optimize the animal feeding management from the nutritional point of view, of production, of health and animal welfare, of economic income
- use all the theoretical and practical skills acquired and learned during the course to maximize the achievement of goals.

PRE-REQUIREMENTS:

Is necessary to have acquired and assimilated the following knowledge provided by the course "Anatomy and physiology of domestic animals"

- knowledge of the fundamental concepts of Anatomy of the Digestive Apparatus of ruminant and monogastric
- knowledge of the fundamental concepts of Physiology of the Digestive Apparatus of ruminant and monogastric

Is necessary to have acquired and assimilated the knowledge provided by the course of "general chemistry, inorganic and organic"

Is necessary to have acquired and assimilated the following knowledge provided by the course "Mathematics and Physics - Form of Mathematics"

- knowledge of the basic concepts on linear regression, solution of systems of equations with two unknowns and simple correlation

SYLLABUS

BLOCK 1 (8 HOURS) Chemical composition of feed: Proteins. Lipids. Structural and Non-Structural Carbohydrates.

Vitamins. Minerals. Nonprotein Nitrogen Sources. Water.

BLOCK 2 (8 HOURS) Feed Utilization: Digestive tract physiology in ruminants and monogastrics. Digestibility and degradability. Energy metabolism and Protein metabolism.

BLOCK 3 (8 HOURS) Analytic procedure in evaluating feeds for animals: Method Weende. Van Soest method. CNCPS method.

BLOCK 4 (8 HOURS) Expression systems of Energy and Protein value of feeds: Protein value expressed as Biological Value (VB), Digestible Protein. Digestible Protein in the Intestine (DPI). Metabolizable Protein (MP). Energy value expressed as Milk Forage Unit (UFL), Meat Forage Unit (UFC), Net energy for lactation. Cornell Net Carbohydrate Protein System method (CNCPS).

BLOCK 5 (8 HOURS) Feeding behavior and regulation of feed intake: Factor affecting feed intake. Feeding behavior. Predicting feeding intake. Techniques of feed distribution. Body Condition Score. Fecal score.

BLOCK 6 (8 hours) Nutrient requirements: Criteria and methods for estimating requirements of energy, protein, lipids, minerals, vitamins, carbohydrates structural, non-structural carbohydrates and water for animals. Requirements for maintenance and gain, lactation, pregnancy, growth and activity.

BLOCK 7 (8 HOURS) Animal Feeds: Classification and identification of the main types of animal feeds. Assessment of nutritional and dietary quality of green fodder, hay, silage, by-products, cereal grains, legume grains. Classification as energy sources, protein supplements, roughages and feed additives.

BLOCK 8 (8 HOURS) Diet Formulation: Criteria and methods for the planning and execution of diet formulation, by hand and by computer, for different classes of livestock.

BLOCK 9 (16 HOURS exercises): Applications: Guided technical visits to livestock and feed mill companies. Guided technical visits to chemical laboratory for chemical analysis of feed. Solving exercises under supervision on the calculation of UFL, UFC of different feed, calculation of the dry matter intake, calculation of nutrition requirements of several classes of animals. Solving exercises on the diet formulation / rations using excel sheet. Vision of diet formulation by open access programs.

TEACHING METHODS

The course is arranged as follows:

- Theoretical lessons on all subjects of the course (64 hours);
- Tutorials/practice (16 hours)
 - Guided visit at the Laboratory "Chimico Bromatologico" to observe the procedures for feed chemical analysis (3 hours)
 - Technical visit at livestock farms of sheep, goats and cows (4 hours)
 - Technical visit at feed mill (2 hours)
 - Classroom tutorials for the calculation of nutritional value of feed, feed intake and for the formulation of diets for animals (7 hours)

At the end of the guided visit in the Laboratory "Chimico Bromatologico", students, individually, still have the option to access the lab spaces, in order to deepen the subjects treated, after programming with the tutor.

EVALUATION METHODS

The aim of the examination is to test the level of achievement of the previously mentioned educational goals and expected learning outcomes.

The exam is divided into 2 parts and takes it place on the same day:

- an oral examination on each block indicated in "Course content", will also be evaluated for their ability to link and compare different aspects covered during the course; to pass the test it is necessary to acquire at least 18 points out of 30;
- discussion of a practical project concerning formulation of a diet for an assigned type of animal production; to pass the test it is necessary to acquire at least 18 points out of 30;

The final grade is the average of the two scores. If one of the two test is insufficient it is necessary to repeat the test had proved inadequate.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

TEXTBOOK

- Antongiovanni M., Gualtieri M., 1998, Nutrizione e alimentazione animale, Edagricole, Bologna;
- Betti S. e Pacchioli M.T., 1994, L'alimentazione della vacca da latte. – CRPA, Edizioni l'Informatore Agrario;
- Mcdonald P., Edward R.A., Greenhalgh J.F.D., 1992, Nutrizione animale, Tecniche Nuove, Milano;

- Cevolani D., 2005, Gli alimenti per la vacca da latte. Edagricole;
- Proto V. 1984; La produzione del suino magro. Edagricole, Bologna
- Monetti P.G. 2000. Allevamento dei bovini e dei suini. Cristiano Girarldi Editore, Ozzano dell'Emilia (BO)

TEXTS DEEPENING

- NRC: Nutrient Requirements of Dairy Cattle: Seventh Revised Edition, 2001. The National Academies Press;
- Alimentation des Bovins, Ovins et Caprins: les Tables INRA 2010. Octobre 2010, Éditions Quae.
- Pulina G., 2001; L'alimentazione degli ovini da latte. Avenue media. Bologna.
- Cannas A. e Pulina G. 2005; L'alimentazione della capra da latte. Avenue media. Bologna.
- Succi G. e Hoffmann I. 1993; La vacca da latte. Città Studi, Milano
- Piccioni M., 1989; Dizionario degli alimenti per il bestiame, Edagricole, Bologna.

ON-LINE EDUCATIONAL MATERIAL

- Alimenti:<http://erclib.vet.unibo.it/jb/bd/alimenti/>
- Open access programs

INTERACTION WITH STUDENTS:

At the beginning of the course, after describing the objectives, the program and the verification procedures, the teacher provides students educational materials. Simultaneously, he collects a list of students, together with your name, freshman, email and / or cell phone.

Consulting hours

<i>Day</i>	<i>FROM (hour)</i>	<i>TO (hour)</i>	<i>AT</i>
MANDAY	16:30	18:30	TEACHER OFFICE
TUESDAY	16:30	18:30	TEACHER OFFICE
WEDNESDAY	16:30	18:30	TEACHER OFFICE
THURSDAY	16:30	18:30	TEACHER OFFICE

Over time weekly meeting, the teacher is available at all times for a contact with students through email and / or phone service.

EXAMINATION SESSIONS (FORECAST)¹

23/02/2017, 23/03/2017, 20/04/2017, 25/05/2017, 22/06/2017, 31/07/2017, 21/09/2017, 19/10/2017, 23/11/2017, 14/12/2017.

SEMINARS BY EXTERNAL EXPERTS YES X NO

FURTHER INFORMATION

BOARD EXAM

President: prof.ssa Adriana DI TRANA

Component: prof. Corrado PACELLI

Substitute: prof. Raffaele BONI

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.