UNIVERSITÀ DEGLI STUDI DELLA BASILICATA

SAFE - SCUOLA DI SCIENZE AGRARIE, FORESTALI, ALIMENTARI ED AMBIENTALI

ACADEMIC YEAR: **2019/2020**			
COURSE: **ANIMAL NUTRITION AND FEEDING**			
TYPE OF EDUCATIONAL ACTIVITY: **Characterizing**			
TEACHER: **DI TRANA ADRIANA C. L.**			
e-mail: **adriana.ditrana@unibas.it**		website: https://scholar.google.it/citations?user=1dHv7pgAAAAJ&hl=it&oi=ao	
phone: **+39 0971 205021**		mobile (optional):	
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: **II semester**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

Objectives of the Course "Animal Nutrition and Feeding" are: (i) to provide basic knowledge of animal nutrition and animal feeding; (ii) to provide tools for evaluating feed and raw materials used in animal feeding; (iii) to provide tools for formulating balanced animal ration for animal health and well being and the healthiness of the productions.

- **Knowledge and understanding:** the student will acquire skills and competences in the identification, classification, nutritional and physiological evaluation of food for animals of zootechnical interest; ability to evaluate and estimate the food intake and nutritional requirements of the animals in the different production phases; ability to formulate balanced diets for animals with different productive destiny.
- **Applied knowledge and understanding skills:** the student will acquire the ability to apply in real cases the knowledge acquired to manage the feeding of animals and the collection, conservation and nutritional evaluation of food; ability to identify the appropriate solutions to optimize the nutritional management of animals from a nutritional, productive, economic, health and well-being point of view; ability to apply all the theoretical and practical tools acquired and learned during the course to maximize production and optimize the costs of ration.
- **Autonomy of judgment:** the student must be able to identify the weaknesses and strengths of the food management of various farms. The student must be able to evaluate and choose the food strategy suitable for the type of animal in production.
- **Communicative Skills:** the student must have the ability to explain, in a simple way, organizing in a logical way, with a correct language and with the aid of graphs and tables, the knowledge and skills acquired.
- **Ability to Learn:** the student must be able to collect, acquire, organize and rework, independently, the information received during the lessons and through the consultation of texts and / or publications and with the help of computer tools; to constantly update on the themes of nutrition and animal feeding.

PRE-REQUIREMENTS: The knowledge provided by the course of Anatomy and Physiology of Animals, General Chemistry, Inorganic and Organic Chemistry, Mathematics and Physics are recommended.

SYLLABUS

The course is divided in 9 blocks.

BLOCK 1 (8 HOURS) Chemical composition of feed: Proteins. Lipids. Structural and Non-Structural Carbohydrates. Vitamins. Minerals. Non-protein Nitrogen Sources. Water.

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

BLOCK 3 (8 HOURS) Analytical systems for evaluation of feeds: Method Weende. Van Soest method. Cornell Net Carbohydrate Protein System (CNCPS) method

BLOCK 4 (8 HOURS) Expression systems of protein value and energy value of feeds: Protein value expressed as Biological Value, Digestible Protein. Digestible Protein in the Intestine. Metabolizable Protein. Energy value expressed as Milk Forage Unit, Meat Forage Unit, Net energy for lactation, Total Digestible Nutrients.

BLOCK 5 (8 HOURS) Feeding behavior and regulation of feed intake: Factor affecting feed intake. Feeding behavior. Estimation methods of feed intake. Techniques of feed distribution. Body Condition Score. Fecal score.
BLOCK 6 (8 hours) Nutrient requirements: Criteria and methods for estimating animals requirements of energy, protein, lipids, minerals, vitamins, carbohydrates structural, non-structural carbohydrates and water. Requirements for maintenance and gain, lactation, pregnancy, growth and activity at pasture.
BLOCK 7 (8 HOURS) Livestock feed: Classification and identification of the main types of animal feed. 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 additives.
BLOCK 8 (8 HOURS) Diet Formulation: Criteria and methods for planning and execution of diet formulation 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 animal feed. Solving exercises under supervision on the calculation of UFL, UFC of different animal feed, calculation of 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 animal feed, feed intake and for the formulation of diets for animals (7 hours).

EVALUATION METHODS

During the course, the verification of learning will be performed by asking students questions to evaluate the ability to compare, link and deepen aspects covered in previous lessons.
The final assessment will consist of an oral exam in which the level of achievement of the previously indicated training objectives is assessed.
The exam is divided into 2 parts:

- 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.

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;
- Capitolo "Determinazione del valore nutritivo" di G. Piva, pagine 39-50 del libro AIA 1995. Valutazione degli alimenti e dello stato metabolico nutrizionale dei ruminanti. AIA, Roma.
- Cevolani D. 2014. Prontuario degli alimenti per la vacca da latte ed il bovino da carne. 85 schede per valutare le materie prime. Edagricole, Bologna.
- Monetti P.G. 2000. Allevamento dei bovini e dei suini. Cristiano Girarldi Editore, Ozzano dell'Emilia (BO)

ON-LINE EDUCATIONAL MATERIAL

- Animal feed: https://www.feedipedia.org/content/feeds?category=13593; https://www.fefac.eu/
- Open access programs

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

INTERACTION WITH STUDENTS:

At the beginning of the course the objectives, the program, the reference texts, the didactic and evaluation methods will be illustrated. The teaching material will be provided to the students attending the course. At the same time, a list of students will be collected, accompanied by name, surname, matriculation number and email address in order to plan the practice.

Consulting hours

Day	***FROM (hour)***	***TO (hour)***	***AT***
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: adriana.ditrana@unibas.it

EXAMINATION SESSIONS (TENTATIVE)[1]

23/05/2019, 20/06/2019, 25/07/2019, 19/09/2019, 24/10/2019, 21/11/2019, 19/12/2019, 23/01/2020, 20/02/2020, 19/03/2020, 23/04/2020.

EVALUATION COMMITTEE

President: prof.ssa **Adriana DI TRANA**

Member: prof. Corrado PACELLI

Replacement member: prof. Raffaele BONI

SEMINARS BY EXTERNAL EXPERTS YES X NO □

FURTHER INFORMATION

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