Code: 1792 **Animal Nutrition**
Degree: 1st cycle – Animal Production Engineering; 2nd cycle – Agriculture
Stream: Agriculture – Agriculture and Animal Production
Curricular Year: 2nd (APE) / **1st** (Agr) **Semester Course: 2nd**
Credits: 6 ECTS **Compulsory** (Animal Production Engineering)
Language: Portuguese/English **Optional** (Agriculture)
Responsible: Luísa Almeida Lima Falcão e Cunha
Other lecturer(s): -
Endereço Web: http://www.isa.utl.pt/home/node/3798

1. Contact hours:
Lectures 28 **Practicals/Laboratory** 42 **Others** 14 **Total** 84

2. Objectives:

Knowledge of the basic principles of animal nutrition:
- Knowledge of the nutritional value of feeds for various animal species;
- Knowledge of requirement of animals;
- Knowledge of energy and protein systems for ruminants and monogastrics

3. Programme:

1. Introduction to the study of nutrition and feeding of animals: concept and fields of nutrition and feeding; classification of nutrients;
2. Feed for animals: classification; general characteristics; composition and analysis: basic and critical study; digestion and absorption. Digestibility: concept, meaning and practical interest; methods for determining and estimate. Metabolic use of nutrients.
3.Feed energy. Measuring of energy metabolism; Energy requirement of animals. Supply of energy by feed: energy degradation - importance and factors of variation according the species and the feed. Systems for expressing the energy value of feeds and energy requirements of animals: ruminants and monogastrics; use to predicting the energy value of feeds. Analysis of raw-materials as energy efficiency feed in the diet of ruminants and monogastrics.
The use of energy systems in diet formulation for monogastrics and ruminants
4. Protein nutrition. Protein requirement of animals. The nitrogen in feeds.
Protein nutrition of monogastrics. Digestive and metabolic efficiency. Evaluation of protein in feeds: methods; bioavailability of essential amino acids; feeds as a source of N for monogastrics.
Protein nutrition of ruminants. Utilization of feed proteins in digestives compartments. Protein systems: measures of protein food value for ruminants. Analysis of raw materials as protein source in the diets of ruminants.
The use of protein systems in diet formulation of ruminants and monogastrics
5. Mineral nutrition. Characterization and function of mineral elements. Macronutrients. Micronutrients. Interactions.
6. Vitamins nutrition. Characterization and function of vitamins. Fat-soluble and water soluble vitamins.

4. Bibliography:

Main Bibliography

McDonald P., Edwards R.A., Greenhalgh J.F.D., Morgan C.A., 2002. Animal Nutrition. 6th Ed. Pearson Education Limited, UK.
Cheeke P.R., 2004. Applied Animal Nutrition - Feeds and Feeding. Macmillan Publishing Company, NY, USA.

Other Bibliography

A FRC,1993. Energy and Protein Requirement of Ruminants. CAB International, UK, 159p
INRA 1987. Alimentation des Ruminants: revision des systémes et des tables de l´INRA. Bull. Tech., CRZN, Theix, 70.
Jarrige R, Ruckebusch Y, Demarquilly C, Farce M-H, Journet M,1995. Nutrition des ruminants domestiques ingestion et digestion. INRA, Paris
Moughan PJ, Verstegen M W A, Visser-Reyneveld MI, 2000. Feed evaluation – Principles and practice. Wageningen Academic Publishers, The Netherlands
Van Soest, P, 1994. Nutritional Ecology of the Ruminant. 2 Ed., Cornell Univ Press, USA

5. Assessment:

25% - 3 multiple-choice tests and simple pratical problems 75% - final examination

6. Estimated Workload:	168	Hours
7. Last Update:	15/7/2010	