

Course Unit	Animal Food Science and Nutrition		Field of study	Agricultural and Animal Production	
Bachelor in	Veterinary Nursing		School	School of Agriculture	
Academic Year	2022/2023	Year of study	2	Level	1-2
Type	Semestral	Semester	1	ECTS credits	6.0
Code	9085-671-2103-00-22				
Workload (hours)	162	Contact hours	T 30	TP -	PL 26
			TC 4	S -	E -
			OT 20	O -	

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Vasco Augusto Pilão Cadavez

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Have knowledge of food composition analysis systems, knowledge of nutrients, their digestive and metabolic usage.
2. Quality criterias to evaluate the food and basic principles for the feeding of livestock species.
3. With the aim of enabling learners to formulate nutritionally balanced diets to increase the conversion of food into zootechnical products.

### Prerequisites

Before the course unit the learner is expected to be able to:

1. Before the course unit the learner is expected to be able to: Have good knowledge
2. of anatomy, comparative morphology, animal biochemistry, physiology, ethology and welfare.

### Course contents

Food composition and analysis systems of food to provide knowledge of the nutrients. Anatomy and physiology of the digestive tract of various livestock species. Digestive and metabolic use of nutrients. Systems of evaluating the energy and protein of food. Vitamin and mineral nutrition. Types of food and additives. Criteria for evaluating the quality of food and basic principles for food. Basic calculating techniques in formulating rations.

### Course contents (extended version)

1. Introduction - Concepts of animal nutrition and feeding
  - Evolution of the science of animal nutrition. Relationship to other sciences.
  - Importance and objectives of the discipline. Position of various animal species in the chain food.
  - Concept of food and nutrient.
2. The animal and food - Reference to general nutrient from food
  - Water - Carbohydrates. - Proteins. - Lipids. - Minerals. - Composition of animals and plants.
3. Evaluation food utilization. - Productive value concept and nutritional value
  - Concept of digestibility. - Digestive utilization coefficient as a measure of digestibility.
  - Digestibility estimates based on composition food chemistry.
  - Microbiological methods for the determination of the digestibility of foods.
4. Nutritional Significance of the digestive system of various animal species
  - Digestive organs of different species.
  - Aspects on the physiology of digestion of domestic carnivores, horses, pigs, rabbits and birds.
  - Microbial digestion in ruminants. - Rumen microbiology.
  - Rumen microbial population. - microbial Interactions.
  - Digestion of carbohydrates, lipids and proteins in various livestock species.
5. Analysis of foods. - what chemical and biological analysis of food in Animal nutrition.
  - Food analysis systems. Analysis conventional (Weende).
  - Analysis solutions detergents (Van Soest).
  - Comparison of analytical system Weende and analytical system of Van Soest.
6. Fundamental aspects of Intermediary metabolism.
  - Metabolism of carbohydrates, lipids and proteins. - General aspects of biosynthesis
  - General aspects of metabolic regulation.
7. Food Energy - Application of the principles of thermodynamics to food energy.
  - Energy content of foods. - Gross Energy. - Digestible Energy
  - Metabolizable Energy - Net energy and energy deposition. - Heat Increment
  - Concept of basal metabolism and metabolism of fasting.
  - Systems of evaluating the energy of foods
8. Nitrogenous Nutrition - concept of essential amino acid, biological value and CPUP
  - Protein efficiency factors. - Value protein food.
9. Minerals in Animal nutrition
10. Vitamins in Animal nutrition
11. Voluntary Food Intake. - Concept.
  - Theories of the monitoring of intake of food in the short and long term.
12. Requirements. - Pet and animal production.
  - Methods of determination of dietary requirements.
  - Distinction between food requirements and recommendations. - Conservation requirements: concept, and requirements of energy, protein, minerals and vitamins -Growth requirements
  - Requirements for wool production. - Breeding requirements
  - Food requirements for egg production. - Lactation requirements.
13. Feeding and Productive Roles. - Classification of foods.
  - Tables of nutritional value of food and feed recommendations.
  - Techniques and general procedures to be adopted in formulating feeds
  - Feeding of domestic carnivores, horses, cattle, sheep, goats, pigs, poultry, rabbits and new pets.
14. Feeding and preventive nutrition in dog and cat.
  - Body condition and weight control; - Nutritional counseling to the animal tutor;
  - Special needs in newborns. - Special needs in pregnant / lactating.
  - Special needs in geriatric animals. - Nutritional support and assisted feeding.
  - Pet foods, raw foods and homemade food.
15. Therapeutic nutrition in the main pathologies of companion animals.
  - Gastrointestinal and hepatic diseases, - Urinary tract diseases, - Endocrine diseases,
  - Heart diseases, Musculoskeletal diseases, Tumor diseases.
  - Particular cases (refeeding syndrome and others).
16. Practical: - Laboratory practice.
  - Calculation of dry matter digestibility of organic matter from tabulated values.
  - Calculating the energy value and protein feed different systems studied.

**Course contents (extended version)**

- Equivalences and conversions. Techniques in formulating rations.
- Basic calculation techniques in formulating rations for different domesticated species.
- Clinical nutrition and weight management.

**Recommended reading**

1. Artigos científicos da especialidade. BAKSHI, M. , WADHWA, M. , 2014. Recent Advances in Animal Nutrition. Astral International, India, 377 pp.
2. LINTON, R. , BRADLEY, G. , CHAMOCK, O. , 2013. Animal Nutrition and Veterinary Dietetics. The Edinburgh Veterinary Series. Literary Licensing, LLC, EUA, 416 pp.
3. ARMSBY, H. , 2015. The Principles of Animal Nutrition: With Special Reference to the Nutritional Needs of Farm Animals (Classic Reprint). Forgotten books, EUA, 646 pp.
4. WORTINGER, A. , BURNS, K. , 2015. Nutrition and Disease Management for Veterinary Technicians and Nurses. 2ª edição, John Wiley & Sons Inc, 272 pp.
5. McNAMARA, J. , 2013. Principles of Companion Animal Nutrition. Pearson Education, EUA, 312 pp.

**Teaching and learning methods**

Classes of theory and practice. Laboratory practice. Calculation of energy and protein value of food for the different systems studied. Feeding techniques. Establishing diets and feeding plans for different livestock species. When the teacher is absent, students should work on the data of laboratory practices.

**Assessment methods**

1. Written insert examinations - (Regular, Student Worker) (Final)
2. Restrict exam - (Regular, Student Worker) (Final)
3. General exam - (Regular, Student Worker) (Supplementary, Special)

**Language of instruction**

Portuguese

**Electronic validation**

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22-12-2022	23-12-2022	23-12-2022	31-12-2022