INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Animal Feeding Technologies			Field of study	Animal Science		
Master in	Technology and Animal Science			School	School of Agriculture		
Academic Year	2022/2023	Year of study	1	Level	2-1	ECTS credits	6.0
Type	Semestral	Semester	1	Code	5026-453-1103-00-22		

Workload (hours)	162	Contact hours	T	TP	PL	TC	S	E	OT	O
			30	-	26	-	4	-	20	-

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 and analysis systems, knowledge of nutrients, their digestive and metabolic usage.
2. Criterias for evaluating the quality of food and basic principles for the feeding of zootechnic animals, house pets, wild animals and those in captivity.
3. With the aim of enabling learners to formulate nutritionally balanced diets to increase the conversion of food and the well being of the animals.

Prerequisites

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

Course contents

Food composition and analysis systems . Knowledge of nutrients. The digestive and metabolic use of nutrients. Nutritional characteristics and use of food for zootechnic animals and house pets. Systems of evaluating the energy and protein of food. Vitamin and mineral nutrition. Types of food and additives. Ingestion of food. Nutritional requirements of zootechnic animals, house pets, wild animals and those in captivity.

Course contents (extended version)

1. Concepts ofanimal nutrition and feeding. Evolution of the Science of Animal Nutrition.
   - Relationship to other sciences. Objectives of discipline 2. 2-Composition of animals
   - and plants. Concept of food and nutrient
2. General nutrients.
   - Water – carbohydrates – Proteins –Lipids – Minerals
   - Food Analysis. The meaning of food analysis in animal nutrition
   - Food analysis systems Analysis conventional (Weende).
   - Methodology and chemical composition of analytical groups.
   - Analysis by detergents solutions (Van Soest).
   - Methodology and concepts of neutral detergent fibre (NDF) and fiber. acid detergent (ADF)
   - Comparison of analytical system of Weende and analytical system of Van Soest
3. Productive value concept and nutritional value. Concept of digestibility.
   - Digestibility estimates based on chemical composition of foods.
   - Microbiological methods for the determination of the digestibility of foods. .
4. Digestive organs of different species.
   - General aspects on the physiology of digestion on ruminants and monogastric.
   - Microbial digestion in ruminants. General aspects of rumen microbiology.
   - Rumen microbial population Microbial Interactions.
   - Digestion of carbohydrates of various livestock species.
   - Digestion of proteins of various livestock species.
   - Digestion of lipids of various livestock species.
   - Nutrient metabolism Metabolism of carbohydrates, lipids and proteins.
   - Aspects of biosynthesis
5. ENERGY FOOD application of the principles of thermodynamics to food energy.
   - Energy of foods Gross Energy 2. 2-Digestible Energy
   - Metabolizable Energy Net energy and energy deposition.
   - Heat Increment. Concept of basal metabolism and metabolism of fasting from food.
   - Systems of evaluating the energy of food. .
6. Concept of essential amino acid, biological value of protein and CUPP.
   - Protein efficiency factors.
   - Systems of evaluating the protein of food.
7. Role of minerals and vitamins in food.
   - Functions, disorders, symptoms of major sources of grace and macroelementos.
   - Functions, disorders, symptoms of major sources of grace and microelementos.
   - Functions, disorders, symptoms of deficiency and main sources of fat soluble vitamins.
   - Functions, disorders, symptoms of deficiency and main sources of water-soluble vitamins.
8. FOODS AND ADDITIVES
   - Feedstuffs and feeds concentrate. Additives
   - Additives that influence the stability of food,
   - processing or nutritional and physical properties.
   - Additives that modify animal growth, feed efficiency,
   - metabolism and its performance high. Additives that modify the state of health of the animal.
   - Additives that alter the acceptance of the product by the consumer.
9. VOLUNTARY FOOD INTAKE
   - Concept
   - Theories of the monitoring of intake of food in the short and long term.
   - Sensory stimulating.
   - quimiostátic, lipostátic and thermostatic theories.
10. Practical component:
   - Laboratory practic Food analysis
   - Weende method. Van Soest method.
   - calculation of dry matter digestibility of organic matter
   - from tabulated values.
   - Techniques in formulating rations.

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Recommended reading

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

Teaching and learning methods

Classes of theory and practice. Laboratory practice. Calculation of digestibilities in vivo by different methods. Calculation of energy and protein value of food for the different systems studied. Feeding techniques. When the teacher is absent, students should work on the data of laboratory practices and should produce a theoretical and practical work.

Assessment methods

1. 2 Written insert examination (83. 3%) - (Regular, Student Worker) (Final)
2. Restrict Exam(16. 7%) - (Regular, Student Worker) (Final)
3. General Exam (100%) - (Regular, Student Worker) (Supplementary, Special)

Language of instruction

Portuguese

Electronic validation

Vasco Augusto Pilão Cadavez	Teresa Maria Montenegro Araújo A. Correia	Alfredo Jorge Costa Teixeira	Ramiro Corujeira Valentim
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