

Module code: MOD011333	Version: 1 Date Amended: 11/Apr/2025
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1. Module Title
Principles of Animal Nutrition

2a. Module Leader
Sifelani Chikunya

2b. School
Writtle School of Agriculture, Animal and Environmental Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions			
Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:			

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

This module provides you with the knowledge and skills that underpin the science of animal nutrition and feeding practice. You'll explore comparative aspects of digestion, evaluate feed ingredients and examine the chemical composition of animal feeds. You'll also study the biological functions of nutrients and the physiological basis of nutrient requirements. In addition, you'll investigate methods for assessing nutrient utilisation in animals, as well as factors that regulate appetite and voluntary feed intake in farm, companion and zoo species.

Through hands-on laboratory sessions, you'll gain practical experience in feed analysis skills used within the animal feed industry. You'll also learn how to calculate nutrient and ingredient levels in animal diets and develop the skills and confidence to interpret, validate and evaluate feed composition information.

6b. Outline Content

COMPARATIVE DIGESTIVE PHYSIOLOGY: Analysis of differences and/or similarities in anatomy of gastrointestinal tracts, nature and location of agents of digestion, chemical nature of absorbed end products, advantages and disadvantages of different modes of digestion, and consequences for nutrient utilisation.

FOOD INTAKE AND FEEDING BEHAVIOUR: mechanisms controlling appetite and voluntary food intake, measurement and prediction of food intake, factors influencing food intake.

ASSESSMENT OF NUTRIENT UTILISATION: measurement of digestibility e.g. metabolism trials, growth trials, use of indigestible markers, in-vivo, in-vitro, and in-sacco techniques.

PROTEIN AND ENERGY UTILISATION: physiological basis of protein and energy requirements, partitioning of energy, measurement of animal feed energy, essential amino acid requirements, assessment of protein quality for ruminant and non-ruminant animals, and factors affecting protein and energy requirements.

VITAMINS AND MINERALS: biological functions, dietary sources, deficiency symptoms and nutritional disorders, toxicity and general feeding management.

PROCESSING ANIMAL FEEDS: rationale for processing raw dietary ingredients, exploration of the various mechanical, chemical, thermal, and biological methods of processing animal feeds.

PRINCIPLES OF RATION FORMULATION: concept of a balanced diet, information required to formulate diets, methods of formulating animal diets such as Pearson square method and computer based linear programming methods.

FEED COMPOSITION ANALYSIS: laboratory methods for analyzing nutrient composition of feedstuffs e.g. proximate analysis (dry matter, crude fibre, crude protein, ash, ether extract), detergent methods for fibre analysis, familiarisation with laboratory equipment and its use.

6c. Key Texts/Literature

The reading list to support this module is available at: <https://readinglists.aru.ac.uk/>

6d. Specialist Learning Resources

None

7. Learning Outcomes (threshold standards)		
No.	Type	On successful completion of this module the student will be expected to be able to:
1	Knowledge and Understanding	Evaluate and appraise the comparative aspects of digestive physiology, techniques for assessing digestibility and methods for processing animal feeds.
2	Knowledge and Understanding	Comprehend biological functions of nutrients, determination of nutrient requirements and the principles of ration formulation.
3	Intellectual, practical, affective and transferrable skills	Perform laboratory procedures to generate nutritional composition data of animal feeds and apply knowledge to interpret and evaluate such data.

8a. Module Occurrence to which this MDF Refers				
Year	Occurrence	Period	Location	Mode of Delivery
2026/7	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	Hours	Learning Outcomes	Details of Duration, frequency and other comments
Lectures	26	1-2	Formal lectures, in-class group discussions
Other teacher managed learning	26	3	Hands-on practical activities in the laboratory, calculation, interpretation/discussion of laboratory results supported by formative tutorials
Student managed learning	98	1-3	Set reading, background reading, study for examination and assignments. Directed reading material and learning activities will be supplied in class and on Moodle. Reading in preparation for in lecture discussions, examination and assignments.
TOTAL:	150		

9. Assessment for the above Module Occurrence

The assessment for some modules includes a presentation (see below for details on how this particular module is assessed). We recognise that presenting, especially to a large group, can cause significant anxiety or distress for some students. If this may affect you, please contact your Module Leader or the Disability and Neurodiversity Service as early as possible. We will work with you to consider appropriate reasonable adjustments. Depending on your individual needs, these might include, for example, presenting to a smaller group or presenting only to a member of academic staff.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Coursework	3	40 (%)	Fine Grade	30 (%)

Report (1500 Words) - Group practical in laboratory and reports written on an individual basis.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Examination	1-2	60 (%)	Fine Grade	30 (%)

Exam (1.5 Hours) - Closed-book, long essay-type (selection of questions from a seen question bank).

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:

- (a) achieve the qualifying mark for each element of fine graded assessment as specified above
- (b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]