

AGRI S9Z04: Biotechnology in Animal Feeds

Module Details	
Module Code:	AGRI S9Z04
Full Title:	Biotechnology in Animal Feeds APPROVED
Valid From::	Semester 2 - 2018/19 (February 2019)
Language of Instruction:	English
Duration:	1 Semester
Credits::	7.5
Module Owner::	Caroline Gilleran
Departments:	Unknown
Module Description:	The aim of this module is to provide students with knowledge of biotechnological advances in the feed industry, specific to the conversion of nutrients to high quality animal products. This is a rapidly growing area in all aspects of agriculture with rapid advances noted in the beef, dairy and broiler industries. This module offers a combination of interactive site visits, master practical classes, and lectures that engage student participation with many of the ongoing novel research studies and advances within feed biotechnology industries internationally.

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	Module Learning Outcome Description
MLO1	Critically assess and evaluate merits and constraints of biotechnology in animal feeds and feeding.
MLO2	Synthesise and appraise the range of value added feedstocks and feed additives being researched and employed in the agri-food sector.
MLO3	Appraise and assess the biotechnological conversion of nutrients to quality animal products.
MLO4	Perform lab practical's efficiently in relation to the compositional analysis and efficiency of specific feedstock's.
Pre-requisite learning	
Module Recommendations <i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
No recommendations listed	

Module Indicative Content
Animal feeds and feeding The digestive systems of ruminant and non-ruminant animals; Rumen microbiome and its role in the efficiency of nutrient utilisation and methane production; Types of traditional feed and feed composition.
Introduction to biotechnology in animal feeds and feeding Merits and constraints of biotechnology in animal feeds and feeding; Legislation; Cost.
Feed additives Enzymes as feed additives; Antibacterials in pig and poultry nutrition; microbial probiotics; Oligosaccharide feed additives; Additives for decreasing methane emissions; Role of yeast supplementation in ruminant nutrition; Concept and application of chelation/protection of mineral/trace element supplements; Protected (by-pass) fat and protein supplements; Novel/future protein supplements.
Feed Efficiency Conversion of nutrients to quality animal products; Effects of diet modification and supplementation on beef quality, milk yield, nutrient absorption and animal waste. Molecular biomarkers for the genetic selection of animals with greater feed efficiency.
Value added feedstock Feed with improved nutritional value, for example, GM crops with improved amino acid content. Feed with less environmental impact, for example, crops with improved phosphorus availability.
Laboratory practicals Compositional analysis of animal feed products (Cellulose, hemi-cellulose, dry matter digestibility, sugar content, crude protein, calorific value) / Molecular markers for the identification of feed ingredients/ Analysis of biotech feed additives.

Module Assessment	
Assessment Breakdown	%
Course Work	40.00%
Final Examination	60.00%
Module Special Regulation	

Assessments

Full Time On Campus			
Course Work			
Assessment Type	Class Test	% of Total Mark	10
Marks Out Of	0	Pass Mark	0
Timing	n/a	Learning Outcome	2
Duration in minutes	0		
Assessment Description Site visits to Industry leaders in the animal feed sector will serve to re-emphasise topics covered in lectures and will be assessed by MCQ quiz.			
No Project			
Practical			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	30
Marks Out Of	0	Pass Mark	0
Timing	n/a	Learning Outcome	4
Duration in minutes	0		
Assessment Description Practical skills/evaluation and report. Practical classes on analysis of biotech feed additives e.g. phytase in poultry feed; Compositional analysis of animal feed products (Cellulose, hemi-cellulose, dry matter digestibility, sugar content, crude protein, calorific value).			
Final Examination			
Assessment Type	Formal Exam	% of Total Mark	60
Marks Out Of	0	Pass Mark	0
Timing	End-of-Semester	Learning Outcome	1,2,3
Duration in minutes	0		
Assessment Description n/a			

Module Workload

Workload: Full Time On Campus

Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Weekly lectures relating to course content.	Every Week	2.60	2.5999999046325684
Practical	Contact	Two laboratory classes on the compositional analysis of animal feed products.	Every Week	0.40	0.40000000596046448
Directed Reading	Non Contact	No Description	Every Week	3.00	3
Independent Study	Non Contact	No Description	Every Week	5.00	5
Online Contact	Contact	Online Discussion Forum	Every Week	0.50	0.5
				Total Weekly Learner Workload	11.50
				Total Weekly Contact Hours	3.50

This module has no Part Time On Campus workload.

Module Resources

Recommended Book Resources

John Wallace, Andrew Chesson. (2008), *Biotechnology in Animal Feeds and Animal Feeding*, John Wiley & Sons, 2008, [ISBN: 3527615342].
Holger Zorn and Peter Czermak. (2014), *Biotechnology of Food and Feed Additives*, Springer, [ISBN: 9783662437612].

Supplementary Book Resources

Michael Richard Bedford, Gary G. Partridge. (2010), *Enzymes in Farm Animal Nutrition*, p.319, [ISBN: 1845936744].
Satish Kumar Jindal, M. C. Sharma. (2010), *Biotechnology in Animal Health and Production*, [ISBN: 9789380235356].

This module does not have any article/paper resources

Other Resources

<http://www.efsa.europa.eu/>.