Syllabus on AS 3103

ANIMAL NUTRITION AND FEEDING

Animal Nutrition and Feeding

Course Outcomes (CO) and Relationship to Program Outcomes (PO)*															
After completing the course, the student must be able to:	PO**														
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
1. *Recognize the fundamental concepts of animal nutrition in the processing of feeds*			E												
2. *Explain and describe the techniques in identifying the feedstuff to be included in formulating feeds for farm animals*											D				
3. *Demonstrate skills in compounding ration for both simple and modified stomach farm animals*											D				
4. *Recognize various techniques in offering feeds to farm animals*											D				
5. *Demonstrate skill in the compounding and processing of feeds for farm animals*											D				
6. *Explain the concept in processing feeds for compound stomach farm animals*											D				
7. *Demonstrate knowledge and skills in processing and utilizing silage for ruminant animals*											D				
8. *Demonstrate knowledge and skills in processing and utilizing hay for ruminant animals*											D				

***Program Outcomes**

- Central Philippine University-based
  - *a. Diligently and religiously strive to offer the best that they could to answer the needs of the world*
  - *b. Manifest the CPU Core Values instilled with them*
- PSG in BS Agriculture
  - *c. Articulate and discuss the latest developments in the specific field of practice;*
  - *d. Effectively communicate orally and in writing using both English and Filipino;*
  - *e. Work effectively and independently in multi-disciplinary and multi-cultural teams;*
  - *f. Act in recognition of professional, social, and ethical responsibilities;*
  - *g. Preserve and promote "Filipino historical and cultural heritage";*
  - *h. Generate and share knowledge relevant to specific fields in the study of agriculture;*
  - *i. Formulate and implement agricultural development plans and programs;*
  - *j. Apply scientific methods in knowledge generation and knowledge application;*
  - *k. Understand and apply the concepts of agricultural productivity and sustainability in the context of national, regional, and global developments;*
  - *l. Engage in agricultural production and post-production activities;*
  - *m. Promote sound agricultural technologies to various clients and in the manpower development for agriculture;*
  - *n. Employ relevant tools in information technology in solving agriculture-related problems; and,*
  - *o. An ability to participate in the generation of new knowledge or in research and development projects.*

**PO – Level: I – Introductory; E – Enabling; D–Demonstrate

Module 1: COURSE INFORMATION

Course Title	*Animal Nutrition and Feeding*
Course Description	*This course tackles the composition and use of feeds, formulation of rations, and feeding practices for livestock and poultry. It uses the existing projects on Feedmill and the Production of Philippine native chicken as an example for this course.*
Prerequisites	*None*
Credit Units	*3 units*
Business units	Lecture: ***2 units*** Laboratory: ***3 units***
Textbook	Wu, G. (2018). Principles of Animal Nutrition. USA: CRC Press (https://heyzine.com/flip-book/df8e1533f1.html) Blair, R. (2018). Nutrition and Feeding of Organic Poultry. USA: CABI (https://heyzine.com/flip-book/bdefa145e3.html) Blair, R. (2018). Nutrition and Feeding of Organic Pig. USA:CABI (https://heyzine.com/flip-book/05be9c371d.html) Chiba, L.I. (2009). Animal Nutrition Handbook. Retrieved on August 10, 2022, from https://www.academia.edu/12404360/Animal_Nutrition_Handbook (https://heyzine.com/flip-book/c749ce3d66.html)
Learning Materials	- *E-book & References* - *Online flipbook* - *Audio-video book* - *Recorded lectures*
Learning Activities	- *Self-learning through the online learning management system* - *Face-to-face lecture and discussion* - *Field visit of feed mill* - *Exposure to the DA Regulatory Division*
Resources Needed	*Connectivity, Native Chicken Production Project, Mini-Feed Mill, Mini-Phytobiotic Processing Equipment*
Assessment Techniques	*Quizzes, Major Exams, and Practical Exams*

Program Outcome	Topics	*Course Outcome*	Learning Schedule
Module 2: THE BASIC OF ANIMAL NUTRITION			
Articulate and discuss the latest developments in the specific field of practice	**I. Animal Nutrition** A.Terms - Nutrition - Nutrients - Nutrient composition - Proximate analysis - Diet - Animal feed - Ration - Roughages - Concentrates	*Recognize the fundamentals concepts of animal nutrition in the processing of feeds*	○ 1st week of class

Program Outcome	Topics	*Course Outcome*	Learning Schedule
	B. Why nutrition is essential to farm animals - Nature of production system - Economics of production - Target products - Consumers' perception C. Classes of nutrients - Carbohydrates - Proteins - Fats - Vitamins - Minerals - Fiber - Water **II. The Function of Feeds** - Embryo development - Growth - Maintenance - Source of energy - Reproduction **III. Relationship Between Animals and their Feeds** - Metabolic control of feed intake - Basic types of feed • Concentrates • Roughages - Classes of feeds based on the preparation • Ready-to-fed • Basemixed • Premixes • Medicated		
Module 3: FEEDSTUFFS AND THEIR NUTRITIONAL COMPOSITION			
Understand and apply the concepts of agricultural productivity and sustainability in the context of national, regional, and global development	A. Nutrient composition of feeds and feedstuffs - The feed elements - The proximate composition - Factors affecting the nutritional composition of feedstuffs B. Feed ingredients - Cereal and cereal by-products	*Explain and describe the techniques in identifying the feedstuff to be included in formulating feeds for farm animals*	○ 2nd week of class

Program Outcome	Topics	*Course Outcome*	Learning Schedule
	- Roots and tubers - Leguminous seeds - Vegetable oil extraction residues - Animal by-products and fats - Miscellaneous ingredients, including sugar industry by-products C. Nutrient requirements of farm animals - Feeding standards - Meeting nutrient requirements for various physiological activities • Maintenance • Production		
NUTRITION FOR SIMPLE AND MODIFIED STOMACH FARM ANIMALS			
Module 4: COMPOUNDING THE RATIONS			
Understand and apply the concepts of agricultural productivity and sustainability in the context of national, regional, and global development	**I. Rules for Balancing the Rations** A. Logical steps in formulating a ration - Identify the animals to be fed - Select nutrient allowances to fit the animal requirement - Select the feedstuffs to meet the nutrient allowances - Determine the volume of each feedstuff **II. Methods of Compounding the Rations** A. Person square method B. Algebraic method C. Trial and error method	*Demonstrate skills in compounding ration for both the simple and modified stomach farm animals*	○ 3rd week of class
Module 5: FEEDING PRACTICES			
Understand and apply the concepts of agricultural productivity and sustainability in the	A. Ad libitum versus restricted feeding B. Wet versus dry feeding	*Recognize various techniques in offering feeds to farm animals*	○ 4th week of class

Program Outcome	Topics	*Course Outcome*	Learning Schedule
context of national, regional, and global development	C. Mash versus pelleted feeds D. Scheduled feeding E. Limit feeding F. Full feeding G. Free access feeding H. Supplemental feeding I. Cafeteria feeding		
Module 6: FEED MILLING			
Understand and apply the concepts of agricultural productivity and sustainability in the context of national, regional, and global development	A. Type of feed milling - Home-based feed milling - Community-based feed milling - Commercial feed milling B. Feed mill equipment - Hammermill - Shifter - Feed mixer - Pellet mill - Weighing scale - Small tools - Engine/electric motor C. Consideration in feed milling - Scale of production - Capital requirement - Availability and cost of feedstuffs all year round - Availability of personnel to carry the tasks - Existing class of feeds in the market - Storage facility and product shelf life - Packaging D. Pre- and post-milling handling practices - Feedstuff handling consideration • Moisture content • Presence of contaminants • Hauling of feedstuffs • Packaging media - Storage considerations • Moisture content • Packaging media • Storage pests • Product shelf life	*Demonstrate skill in the compounding and processing of feeds for farm animals*	○ 5th to 7th week of class

Program Outcome	Topics	*Course Outcome*	Learning Schedule
	E. Product costing and pricing - Fixed cost • Building • Land • Equipment - Operation costs • Labor • Feedstuff • Fuel and oil • Other utility costs - Miscellaneous costs • Discounts • Promotional products • Ads • Other miscellaneous costs - Pricing • Break-even cost-plus mark-up costs		
NUTRITION FOR COMPOUND STOMACH ANIMALS			
Module 7: NUTRITION FOR COMPOUND STOMACH ANIMALS			
Understand and apply the concepts of agricultural productivity and sustainability in the context of national, regional, and global development	A. Review of the ruminant digestive system - Mouth - Esophagus - Rumen - Reticulum - Omasum - Abomasum - Small intestine - Large intestine - Rectum B. Nutritional requirement of ruminant animals - Dry matter - Energy - Protein - Fats C. Factors affecting the protein variation in forages - Maturity - Species - Fertilization - Ensiling - Heat damage	*Explain the concepts in processing feeds for compound stomach farm animals*	○ 8th to 10th week of class

Program Outcome	Topics	*Course Outcome*	Learning Schedule
Module 8: UNDERSTANDING SILAGE MAKING PROCESS AND UTILIZATION			
Understand and apply the concepts of agricultural productivity and sustainability in the context of national, regional, and global development	A. Requirements to achieve a good fermentation - An anaerobic environment - Optimum moisture content - Adequate amount of water-soluble carbohydrates - Adequate population of lactic-acid-producing bacteria - Good buffering capacity of forage - Type of silo B. Phases of silage fermentation - Phase 1: Aerobic phase - Phase 2: Lag phase - Phase 3: Fermentation phase - Phase 4: Stable phase C. Harvesting of silage - When to harvest the silage - Determining if the silage was properly ensiled - How to fed the silage	*Demonstrate knowledge and skills in processing and utilizing silage for ruminant animals*	○ 11th to 13th week of class
Module 9: HAY-MAKING FOR SMALLHOLDERS			
Understand and apply the concepts of agricultural productivity and sustainability in the context of national, regional, and global development	A. Hay-making - Importance - Steps • Cut • Dry • Rake • Collect • Bale • Store B. Crops for hay-making - Natural pasture - Sown grasses C. Harvesting D. Drying, raking, and collecting E. Baling F. Storing hay G. Feeding hay	*Demonstrate knowledge and skills in processing and utilizing hay for ruminant animals*	○ 14th to 16th week of class

Course Policies and Procedures

Learning Materials

Every student is expected to be in the online class on the scheduled date for lectures and actively participate in the learning process. Given that the learning activities are online and you can visit the learning platform anytime, the total activity hours recorded in your canvas will be used as the basis for your attendance. The full term comprises 75-hour sessions (Lecture and Laboratory), and your allowable absences are 20% of the total session hours. In case of illness or loss of connectivity, the student must communicate as soon as possible with the teacher, showing the reasons for the absences.

Academic Honesty

Students are responsible for their learning and development. They are responsible for being active learners by attending class, completing the class and laboratory assignments, and preparing before the scheduled class session. Students are expected to understand and maintain high standards of academic honesty. Examples of academic dishonesty include, but are not limited to, the following:

- *Cheating*
- *Plagiarisms*
- *Fabrication of statement beyond reality*
- *Conspiring with others for acting dishonestly works*

Assignments and Group Works

Students are expected to submit assignments as scheduled. Failure to submit an assignment when due will earn zero points for that assignment. Only under extenuating circumstances, for which the student has notified the teacher in advance, will be considered for a late submission.

Breakdown of Grades

Assessment Methods	% to the total grades
Quiz	10
Assignment	10
Major Exams	
Prelim	10
Midterm	20
Final	30
Practical Exam	20
Total	**100**