AGRI 0203 - ANIMAL FEEDS AND NUTRITION

Catalog Description

Formerly known as AGRI 12
Advisory: Eligibility for ENGL 1A
Hours: 108 (54 lecture, 54 laboratory)
Description: An introduction to the feeds and nutrition of animals including basic digestive system anatomy and physiology; composition and selection of feeds; characteristics of nutrients; principles of nutrition; nutrient requirements of non-ruminant and ruminant animals; and formulating diets to meet these requirements. (CSU)

Course Student Learning Outcomes

- CSLO #1: Evaluate the role of livestock feeding in human nutrition and human food safety as well as agriculture production.
- CSLO #2: Assess changing nutritional requirements based upon animal physiological development and stage of production.
- CSLO #3: Evaluate economic, environmental and social factors and trends in feeding practices and management.
- CSLO #4: Compare and contrast various types of roughages, protein, high-energy feedstuffs, mineral and vitamin supplements, feed additives, nutrient assessment techniques, primary and by-product feeds, forms and processing techniques and ration formulation techniques.

Effective Term

Spring 2021

Course Type

Credit - Degree-applicable

Contact Hours

108

Outside of Class Hours

108

Total Student Learning Hours

216

Course Objectives

Lecture Objectives:
1. Identify career requirements and potential opportunities leading to successful employment.
2. Evaluate the role of livestock feeding in human nutrition and human food safety.
3. Analyze cultural inputs that have shaped the livestock nutrition industry.
4. Assess changing nutritional requirements based upon animal physiological development and stage of production.
5. Relate type of GI tract to the type of diet required and nutritional management.
6. Categorize nutrients by class and discuss the metabolism of each as well as their feeding standards.
7. Appraise animal behavior and relate it to feeding practices and management.
8. Assemble & organize data used in ration formulation.
9. Evaluate economic factors and trends in feeding practices and management.
10. Formulate rations with economic feasibility using the Pearson Square method.
11. Compare and contrast various types of roughages, protein, high-energy feedstuffs, mineral and vitamin supplements, feed additives, nutrient assessment techniques, primary and by-product feeds, forms and processing techniques and ration formulation techniques.
12. Interpret National Research Council (NRC) nutrition tables and apply the relevant information to the formulation of livestock rations.
Laboratory Objectives:
1. Assemble & organize data used in ration formulation.
2. Formulate rations with economic feasibility.
3. Identify various feedstuffs.
4. Sort feedstuffs by classification.
5. Analyze feedstuffs for nutritive content.
6. Read and evaluate feedtags for nutritional value.
7. Access nutritional requirements from credible sources.
8. Read a label/feed table and compare and contrast diets.
9. Locate anatomical features of ruminant, monogastric and avian gastrointestinal tracts.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Essay Examinations
  - Example: Sample Question: Compare and contrast nutritional related differences resulting from two different feed processing techniques. Essay will be assessed based upon content accuracy, grammar and style. Rubric Grading.
- Objective Examinations
  - Example: Students will take a multiple choice examination on digestive tract. Standard Grading. Sample Question: Which of the parts of the ruminant digestive tract is where hydrochloric acid is produced? a. rumen b. reticulum c. omasum d. abomasum e. B&D
- Projects
  - Example: Formulate a nutrition management program for a cow-calf operation. Address prebreeding, all stages of pregnancy, stages of lactation, and maintenance. Each of the stages should include a balanced ration (developed using Pearson Square) as well as the cost of the ration (least cost ration). Feedstuffs used in the ration should be available in California (consult local feed stores/mills). Feedstuffs should be evaluated for palatability, nutritional value and economic feasibility. In addition to the actual feeds incorporated into the management plan, the feeding facilities as well as the times and methods of feeding should be included. This project and report will be assessed based

on accuracy of rations based on stage of animal performance, feedstuff availability, correct ration formulation and cost analysis.

- Reports
  - Example: Formulate a nutrition management program for a cow-calf operation. Address prebreeding, all stages of pregnancy, stages of lactation, and maintenance. Each of the stages should include a balanced ration (developed using Pearson Square) as well as the cost of the ration (least cost ration). Feedstuffs used in the ration should be available in California (consult local feed stores/mills). Feedstuffs should be evaluated for palatability, nutritional value and economic feasibility. In addition to the actual feeds incorporated into the management plan, the feeding facilities as well as the times and methods of feeding should be included. This project and report will be assessed based on accuracy of rations based on stage of animal performance, feedstuff availability, correct ration formulation and cost analysis.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. In groups, students will identify anatomical features of ruminant, monogastric and avian gastrointestinal tracts. Tissue examination will occur via dissection. The functions of anatomical features will be reported. Comparison and contrasts will be made between the three different gastrointestinal tracts.

Lecture:

1. Instructor will present information on how to access and interpret NRC nutrition tables. Students will be provided various scenarios of different species and different stages of production and will determine nutrient requirements using the NRC nutrition tables. Lecture Objectives: 4, 12; Laboratory Objectives: 1, 7

Distance Learning

1. The instructor will develop an online text, audio and/or video lecture (with captions), which explains the concept of the National Organic Program or other USDA regulated livestock feed labeling programs. After reading/listening/watching the assigned lecture content students may be asked to participate in a discussion board assignment which explains their understanding and addresses the relevance of the lecture content.

Typical Out of Class Assignments Reading Assignments

1. Students will read the assigned pages from the textbook and be prepared to discuss ruminant microbial symbiosis. Students will give specific examples of feeds that disrupt this microbial population and discuss feeding management strategies to prevent this. 2. Students will be responsible for reading current media and scientific articles regarding animal nutrition and feeding management. For example, students will read articles from peer-reviewed journals regarding ruminant by-pass fats and relate the information to dairy cattle nutrition management assessing its impacts on milk production.

Writing, Problem Solving or Performance

1. Students will complete a series of one page reports on nutritional deficiencies, nutrition management & technology and other aspects of animal nutrition. 2. Students will be given specific livestock production scenarios and evaluate various feed options for: palatability, nutritional value, and economic feasibility.

Other (Term projects, research papers, portfolios, etc.)

Students will design a nutrition management program using least cost rations for the species of their choice. Nutritional requirement changes based on animal purpose and changes in physiological development will be incorporated.

Required Materials

- Livestock Feeds and Feeding
  - Author: Kellems & Church
  - Publisher: Prentice Hall
  - Publication Date: 2010
  - Text Edition: 6th
  - Classic Textbook?: No
  - OER Link:
  - OER:
- Applied Animal Nutrition
  - Author: Cheeke
  - Publisher: MacMillan
  - Publication Date: 2010
  - Text Edition: 6th
  - Classic Textbook?: No
  - OER Link:
  - OER:
- Basic Animal Nutrition and Feeding
  - Author: Pond
  - Publisher: John Wiley and Son
  - Publication Date: 2011
  - Text Edition: 7th
  - Classic Textbook?: No
  - OER Link:
  - OER:
- ANIMAL FEEDING AND NUTRITION
  - Author: JURGENS MARSHALL H and BREGENDAHL KRISTJAN
  - Publisher: Kendall Hunt Publishing
  - Publication Date: 2012
  - Text Edition: 11th
  - Classic Textbook?: No
  - OER Link:
  - OER:
- Principles of Animal Nutrition
  - Author: Wu
  - Publisher: Taylor and Francis
  - Publication Date: 2017

- Text Edition: 1st
- Classic Textbook?: No
- OER Link:
- OER:

Other materials and-or supplies required of students that contribute to the cost of the course.