ADVS 6550/7550
PROTEIN METABOLISM AND NUTRITION

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Hours: By appointment

Objective:
The objective of this course is to make students familiar with processes involved in digestion, degradation and synthesis of microbial protein in the rumen. Special emphasis will be given to protein-energy relationships in the rumen and whole animal. Recent advances in the systems used around the globe for describing protein requirements of an animal will be discussed. In addition to protein requirements, efficiency of protein utilization with reference to nutrient management on the farm will also be discussed. For more details please see the attached course detail.

After taking this comprehensive course, students will have knowledge about the basic, applied and recent advances in the area of protein nutrition.

Course: Digestion, absorption, metabolism and utilization of proteins in ruminants

Topic	Lectures
1. Structure and classification of proteins	
a. Introduction to proteins and amino acids	1
b. Properties and classification of proteins	1
c. Nucleic acids and other nitrogenous compounds	1
2. Digestion and degradation of proteins	
a. Digestion of undegraded intake protein	2
b. Estimation of undegraded intake protein	2
c. Ruminal ammonia and nitrogen recycling	2
3. Microbial protein synthesis in the rumen	
a. Microbial protein synthesis	2
b. Methods to measure microbial protein synthesis	2
c. Factors affecting microbial protein synthesis	3
d. Microbial yield	2
4. Non-protein nitrogen utilization	2
5. Protein-Energy relationship	
a. Interrelationship between protein and energy yielding nutrients	2

6. Protein requirements and utilization

a.	Protein requirements of host animal	1
b.	Utilization of microbial protein	2
c.	Calculation of protein needs	1
d.	Manipulation of protein degradability	2

7. Systems of protein evaluation

a.	Old and new systems of protein evaluation	3
b.	Further research into protein nutrition	2

8. Amino acid

a.	Amino acid requirements	2
b.	Amino acid supplementation	2

9. Practical aspects of feeding protein

a.	Meeting the protein requirements of high producing cows	2
b.	Efficiency of protein utilization	1

10. Protein deficiency and excess feeding 2

Grading: Grading will be based on the percent of the total points earned. Following are tentative cutoff points for letter grades:

A =	>90%	C =	70 - 76%
B+ =	86 - 89%	D =	60 - 69%
B =	80 - 85%	F =	<60%
C+ =	77 - 79%		

Physical impairment:

If a student has any physical disabilities or other problem that will likely require some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability Resource Center (DRC) as soon as possible. Any requests for special considerations relating to attendance, pedagogy, taking examinations etc., must be discussed with and approved by the instructor. In cooperation with DRC, course materials can be provided in alternative formats – large prints, audio or diskette.