Western Technical College

10006171 Livestock Nutrition Principles

Course Outcome Summary

Course Information

Description	The student will demonstrate how to formulate and balance rations for all forms of livestock. In addition, they will also be able to know the nutritional needs of various species and identify different feedstuffs. Students will be familiar with the laws and regulations on livestock feeding along with reading, interpreting, and making recommendations from feed test reports and tags. They will also be able to successfully understand the digestive systems of monogastric and ruminant animals.
Career Cluster	Agriculture, Food and Natural Resources
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	72

Textbooks

Open Education Resource: *A Guide to the Principles of Animal Nutrition*. 1st Edition. Cherian, Gita. Publisher: Oregon State University. Required. https://open.oregonstate.education/animalnutrition

Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Refine Professionalism: Improve Critical Thinking
3. Refine Professionalism: Practice Effective Communication

High Impact Practices

1. Community Engagement - in this course, you will explore and reflect on opportunities presented by the college and the program to become more involved in the community (ex: Employer Spotlights, Volunteerism, Professional Associations, and Community Action Boards)

Course Competencies

1. Investigate the anatomy and physiology of the ruminant digestive system.

Assessment Strategies

1.1. Written Product

Criteria

You will know you are successful when

1.1. you identify the parts of the ruminant digestive system.
1.2. you illustrate how the physical characteristics are related to their function.
1.3. you describe the functions of the ruminant digestive system
1.4. you describe the role of digestive enzymes.
1.5. you explain the role of bacterial digestion in the rumen and cecum

Learning Objectives

1.a. Identify parts of digestive system.
1.b. Identify the functions of the digestive system.
1.c. Explain feedstuff digestion.
1.d. Choose appropriate feedstuffs for ruminants.
1.e. Demonstrate healthy rumen function.

2. Investigate the anatomy and physiology of the monogastic digestive system.

Assessment Strategies

2.1. Written Product

Criteria

You will know you are successful when

2.1. you identify the parts of the monogastric system.
2.2. you illustrate how the physical characteristics are related to their function.
2.3. you describes the functions of the non-ruminant digestive system.
2.4. you describe the role of digestive enzymes.
2.5. you explain the role of bacterial digestion in the non-ruminant.

Learning Objectives

2.a. Identify parts of monogastic digestive system.
2.b. Identify the functions of the monogastric digestive system.
2.c. Explain feedstuff digestion.
2.d. Choose appropriate feedstuffs for non-ruminants.
2.e. Demonstrate healthy rumen function.
2.f. Compare digestion processes between ruminants and non-ruminants.

3. Evaluate the functions of the six basic nutrients.

Assessment Strategies

3.1. Written Product

Criteria

You will know you are successful when

3.1. you describe the importance of water, carbohydrates, fats, proteins, minerals, and vitamins in the diet of an animal.
3.2. you explain the typical symptoms of nutrient deficiencies.
3.3. you categorize feedstuffs according to the level of each nutrient.
3.4. you determine the role of each nutrient in the health and nutrition of the animal.
3.5. you describe how animals metabolize the nutrients.
3.6. you describe how feedstuff nutrients are determined.

Learning Objectives

3.a. Explain the six basic nutrients: water, carbohydrates, fats, protein, minerals, and vitamins.
3.b. Describe how livestock metabolize the main nutrients.
3.c. Discriminate the differences of fiber and non fiber carbohydrate digestion in ruminants and non-

ruminants.
3.d. Explain the role of ADF and NDF fiber in the health of the animal.
3.e. Explain the symptoms of a deficiency in either ADF or NDF fiber.
3.f. Identify essential and non-essential amino acids.
3.g. Identify saturated and unsaturated fats for both ruminants and non ruminants.
3.h. Explain the functions of major and trace minerals.
3.i. Explain the functions of fat and water-soluble vitamins.
3.j. Explain the symptoms of mineral deficiency.
3.k. Explain the symptoms of vitamin deficiency.
3.l. Explain the symptoms of amino acid deficiency.
3.m. Explain the symptoms of fatty acid deficiency.

4. Demonstrate methods of feed sampling.

Criteria

You will know you are successful when

4.1. you collect a feed sample
4.2. you compare the quality of feeds to the descriptions
4.3. you calculate percent dry matter, percent moisture, and percent particle size.

Learning Objectives

4.a. Demonstrate the proper way to collect a sample.
4.b. Compare the quality of various feeds.
4.c. Calculate percent dry matter and percent particle size as it relates to ADF and NDF.
4.d. Describe how to take a proper forage sample
4.e. Explain the terms used on a feed analysis report.
4.f. Compare how different feed compositions affect animal performance

5. Evaluate the nutrient content of feedstuffs for livestock.

Assessment Strategies

5.1. Case Study
5.2. Written Product
5.3. Demonstration

Criteria

You will know you are successful when

5.1. you analyze feedstuff reports.
5.2. you evaluate feedstuff reports on the basis of nutrient content.
5.3. you recommend feedstuffs for a designated production level.
5.4. you collect a feed sample
5.5. you compare the quality of feeds to the descriptions.
5.6. you calculate percent dry matter, percent moisture, and percent particle size.

Learning Objectives

5.a. Define the different classifications of feedstuffs.
5.b. Convert feedstuffs from as fed to dry matter basis.
5.c. Evaluate several feedstuffs that are tested by a Testing Lab.
5.d. Identify differences in feedstuff quality using Feedstuff Composition Tables.
5.e. Estimate energy values of feedstuffs.
5.f. Describe all feedstuff nomenclature found on lab analysis reports.
5.g. Identify factors affecting feed quality.
5.h. Identify feed manufacturing terminology.
5.i. Differentiate between a forage and a concentrate.
5.j. Demonstrate the proper way to collect a sample.
5.k. Compare the quality of various feeds.
5.l. Calculate percent dry matter and percent particle size as it relates to ADF and NDF.
5.m. Describe how to take a proper forage sample

6. Determine the nutrient requirements of livestock.

Assessment Strategies

6.1. Research Paper
6.2. Case Study

Criteria

You will know you are successful when

6.1. you predict appropriate dry matter intake and nutrient requirements for specific cows.
6.2. you calculate the nutritional needs of beef cattle based on mature weight and desired rate of gain
6.3. you calculate the nutritional needs of dairy cattle based on mature weight, pounds of milk produced and the % of milk fat

Learning Objectives

6.a. Recognize that different life ages (growing, lactating, and gestating) will require different nutrients.
6.b. Assess the nutrient requirements of a lactating cow.
6.c. Determine how dry matter intake affects dairy rations.
6.d. Choose the correct forages based on availability and quality.
6.e. Determine how stage of lactation affects requirements.
6.f. Assess requirements for dry cows.
6.g. Identify how changes in requirements are affected by environmental factors.
6.h. Choose the correct concentrates and by- product feeds for high producing dairy cows.
6.i. Identify factors affecting the dairy cows health in early lactation.
6.j. Generate reports using Dairy Balancing Software.

7. Balance least cost rations for a livestock herd.

Assessment Strategies

7.1. Written Product
7.2. Case Study

Criteria

You will know you are successful when

7.1. you identify proper feedstuffs used in dairy, beef and swine rations
7.2. you calculate the nutritional values of feedstuffs
7.3. you develop a balanced ration, using a ration sheet for beef

Learning Objectives

7.a. Identify the nutritional requirements of different species.
7.b. Input the correct data for the ration to be completed.
7.c. Input the correct feedstuffs into the ration.
7.d. Adjust the ration according to requirements.
7.e. Apply these principles to different livestock herds: beef, dairy, horse, goat, sheep, etc.

8. Interpret the relationship between feedstuffs quality, animal health, and productivity.

Learning Objectives

8.a. Describe common metabolic disorders
8.b. Describe how metabolic disorders affect lactation and production.
8.c. Research what causes metabolic disorders
8.d. Identify common prevention methods
8.e. Explore treatments metabolic disorders for livestock
8.f. Explain the relationship between nutrition and health
8.g. Recognize the relationship between nutrition and productivity
8.h. Discuss BMPs in determining and obtaining quality forage

9. Evaluate feed additives for livestock.

Learning Objectives

9.a. Determine how additives will differ based on livestock: cattle, horses, goats, sheep, etc.

10. Evaluate modern feed technologies.

Learning Objectives

10.a. Compare computer programs of modern feed technologies
10.b. Describe basic management practices associate with total mixed ration systems (TMRs)

10.c. Identify the basic ration nutrient levels to be feed with individual versus group systems
10.d. Compare advantages and disadvantages of available feeding systems