

Course	Agricultural Science II
Unit	Introduction to Grassland Management
Subunit	Grassland Management Practices
Lesson	Grasslands and the Nutritional Needs of Livestock
Estimated Time	Two 50-minute blocks
Student Outcome	

Analyze the nutrient needs of livestock.

Learning Objectives

1. Describe what determines the nutritional needs of livestock.
2. Describe the daily forage dry matter intake requirements for cattle.
3. Describe when livestock herds have the highest forage quality requirement.
4. Identify how daily dry matter intake is calculated.

Grade Level Expectations

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. PowerPoint Slide
 - PPt 1 – Energy Needs of a Mature Beef Cow for Spring Calving
2. Activity Sheets
 - AS 1 – Calculating Dry Matter Intake
3. *Introduction to Grassland Management* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
4. *Introduction to Grassland Management Curriculum Enhancement, "Unit III – Grassland Management Practices."* University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplemental Information

1. Internet Sites
 - Beef Publications: Feeding Cattle. University of Missouri Extension. Accessed February 14, 2008, from <http://extension.missouri.edu/explore/agguides/ansci/beef.htm#Feeding>.

Interest Approach

Discuss with students how grass quality affects cattle gains, allowing for quicker sales and higher profits. In addition, point out that people who show and judge cattle appreciate the smoother appearance and better overall composition of the animals due to quality forage.

Communicate the Learning Objectives

1. Describe what determines the nutritional needs of livestock.
2. Describe the daily forage dry matter intake requirements for cattle.
3. Describe when livestock herds have the highest forage quality requirement.
4. Identify how daily dry matter intake is calculated.

Instructor Directions	Content Outline
<p>Objective 1</p> <p><i>Just as the nutritional needs of humans differ according to their growth and life stage, so do the nutritional needs of livestock. Ask students to describe what determines the nutritional needs of livestock.</i></p>	<p>Describe what determines the nutritional needs of livestock.</p> <ol style="list-style-type: none">1. Type of production (function)<ol style="list-style-type: none">a. Maintenance: carbohydrates, fats, protein, and mineralsb. Growth: protein, carbohydrates, fats, minerals, and vitamin Dc. Fattening: carbohydrates and fatsd. Reproduction: protein, carbohydrates, fats, and mineralse. Rebreeding: carbohydrates, fats, protein, and vitaminsf. Lactation: carbohydrates, fats, protein, and mineralsg. Work: carbohydrates and fats2. Level of output or production3. Size of the animal
<p>Objective 2</p> <p><i>Ask students if they know the daily forage dry matter intake requirements for cattle. Emphasize that factors such as size and level of production affect the amount of forage required for production. Point out that dry matter intake is given as a percentage of live bodyweight.</i></p>	<p>Describe the daily forage dry matter intake requirements for cattle.</p> <ol style="list-style-type: none">1. Dry beef cow: 2% of bodyweight2. Lactating beef cow (average milk prod.): 2.5% of bodyweight3. Lactating beef cow (superior milk prod.): 3% of bodyweight4. Bull (during breeding season): 2.5% of bodyweight5. Bull (out of breeding season): 2% of bodyweight6. Growing steers and heifers: 3% of bodyweight

Instructor Directions	Content Outline
<p>Objective 3</p> <p><i>Ask students when the herd needs the highest quality forage. Use PPt 1 to illustrate the changing energy needs of a mature beef cow.</i></p> <p>☐ PPt 1 – Energy Needs of a Mature Beef Cow for Spring Calving</p>	<p>Describe when livestock herds have the highest forage quality requirement.</p> <ol style="list-style-type: none"> 1. The herd has the highest forage requirement after the majority of the cows have given birth, when they require energy for lactation and rebreeding (Stage 1). 2. In spring calving, cows calve just before the peak of grass growth in May and June, when forage quality is very high. 3. Fall calving matches the period of highest nutritional needs with another peak in grass growth in October.
<p>Objective 4</p> <p><i>Have students explain how daily dry matter intake is calculated. Point out that optimum production requires close management and supervision. The calculation of daily dry matter intake will help to produce the best livestock possible. Have students complete AS 1.</i></p> <p>📄 AS 1 – Calculating Dry Matter Intake</p>	<p>Identify how daily dry matter intake is calculated.</p> <ol style="list-style-type: none"> 1. Daily dry matter intake = <ul style="list-style-type: none"> # of animals in a class x avg. weight per animal x forage dry matter intake requirement 2. The number of pounds of forage dry matter needed per day for a herd is equal to the total of the daily dry matter intake for all classes of cattle in the herd.
<p>Application</p> <p>📄 AS 1 – Calculating Dry Matter Intake</p>	<p>Answers to AS 1</p> <ol style="list-style-type: none"> 1. 2,136.5 lbs. 2. 1,010 lbs. 3. 3,964 lbs. <p>Other activities</p> <p>Visit the facilities of a local dairy or beef cattle operation. Have the manager describe the procedures used for feeding the cattle and the changes made based on growth, gestation, lactation, and maintenance.</p>

Instructor Directions	Content Outline
<p>Closure/Summary</p>	<p>The true test of productive grassland is the livestock it produces. If the grassland meets the nutritional needs of the animals during all of their life stages, it is successful. In order to meet these needs, the grassland manager must match the production potential of the grasses to them. The best grasslands will provide nutrients in a sufficient quantity to allow the producer to meet his or her production goals for the herd.</p>
<p>Evaluation: Quiz</p>	<p>Answers:</p> <ol style="list-style-type: none"> 1. d 2. d 3. b 4. The herd has the highest forage requirement after the majority of the cows have given birth. In spring calving, cows calve just before the peak of grass growth when forage quality is very high. Fall calving matches the period of highest nutritional needs with another peak in grass growth. 5. Any four of the following: maintenance, growth, fattening, reproduction, rebreeding, lactation or milk production, and work 6. 1,615 lbs. of dry forage matter per day