Livestock Unit, Packet 2.3

First & Last Name: _____ Period/Hour:_____

NOTE: Packets are due after completing Part 5. Check each page to be sure all blanks are completed.

Driving Question: How can we use anatomy for management decisions?

Anchoring Phenomenon: In this unit, we explored how animals convert their feed into products, and how their digestive anatomy affects the feeds they can consume and how they are managed. In this final packet, you will summarize what you've learned in order to present effective strategies for managing a specific kind of production animal based on its digestive anatomy.

Deeper Questions

1. How does digestive anatomy affect how livestock are managed?
2. What are common practices for livestock that optimize production?
3. What are the tradeoffs inherent in these management choices?

Schedule

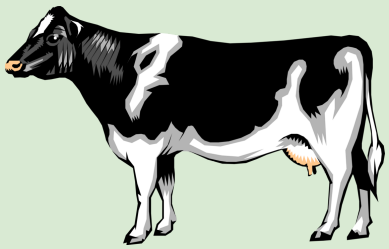
Part 1: Introduction
- Recap of Previous Content

Part 2: Planning
- Choosing species, rations, etc.

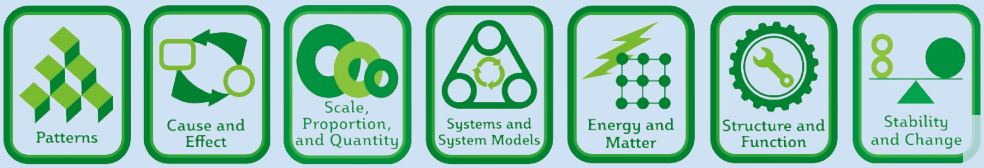
Part 3: Work Time
- Poster Development

Part 4: Presentations
- Presenting your work to the class

Part 5: Career Connections
- Writing Resumes



AFNR Standards: AS.01.02. Assess and select animal production methods for use in animal systems based upon their effectiveness and impacts. AS.02.01. Demonstrate management techniques that ensure animal welfare. AS.03.01. Analyze the nutritional needs of animals. AS.03.02 Analyze feed rations and assess if they meet the nutritional needs of animals.AS.03.03 Utilize industry tools to make animal nutrition decisions.
NGSS Standards (*PEs* & *CCCs are summarized below. SEPs are noted throughout the packet*).
HS-LS1-2. How bodily systems interact in multicellular organisms. HS-LS1-6. How carbon, hydrogen, and oxygen from sugar molecules form amino acids and/or other molecules. HS-LS1-7. How bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.



Semester Schedule

1. Crops Unit
1.1: How can we improve crop productivity?
1.2: How can we explain crop growth using atoms?
1.3: How do we design plant experiments?

2. Livestock Unit
2.1: How do animals convert feed into products?
2.2: How do animals acquire nutrients from their feed?
2.3: How can we use anatomy for management decisions?

3. Genetics Unit
3.1: How can we predict genetic inheritance?
3.2: How do genetic outcomes vary in more complex cases?
3.3: How do we design genetic experiments?

4. Biotech Unit
4.1: How can DNA be modified to enhance species?
4.2 How do we design biotech experiments?

5. Sustainability Unit
5.1: What determines if food production is sustainable?
5.2: What methods improve sustainability in agriculture?
5.3: How do we design sustainability experiments?

These materials were partly developed with assistance from artificial intelligence.

Resource Links: Class Website;

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Part 1: Intro – Review of Core Ideas (2.3.1)

Overview: Work in small teams to identify what you know and what you still need to review. Your instructor may assign specific questions to your group if time is limited. This will prepare you for the unit assessment.

2.1 Core Ideas Review - *Record your ideas separately (e.g., on a white board or scratch paper).*

1. What does livestock feed provide to an animal's cells to enable growth & production?
2. What are cells, and how do their activities affect animal growth and production?
3. What types of feed components are fed to livestock and what nutrients do they provide that enables growth & production?
4. How do nutrients move from food to the cells during digestion? What happens to anything that isn't digested and/or absorbed?
5. What are macronutrients and what roles & functions does each provide?
6. What are micronutrients and what roles & functions does each provide?
7. What is a ration, and what makes a ration balanced? What would occur if a ration were *unbalanced*?
8. Why do an animal's nutrient needs change with age, health, activity, and production stage? How does this affect its ration?
9. What happens to feed nutrients that are not used for production? How does this affect feed efficiency?
10. Develop a conceptual model showing what happens to matter and energy as feed moves through an animal. Include: feed, digestion, absorption, maintenance, growth, production, feces & urine, and heat.
11. What are production and feed efficiency? How are they similar and different, and why do they matter to a farmer or rancher?
12. What factors affect feed efficiency, and how can farmers use information about feed efficiency to make management decisions?

2.2 Core Ideas Review - *Record your ideas separately (e.g., on a white board or scratch paper).*

1. How is food mechanically and chemically broken down during digestion?
2. Why must food molecules be broken down into smaller units, and how are these molecules moved to cells?
3. How do cells use glucose, amino acids, and fatty acids to maintain the body and produce meat, milk, or eggs?
4. How does an animal's digestive anatomy affect the specific types of feed it can consume?
5. What unique anatomical feature allows ruminants (like cattle) to break down cellulose? How do monogastric animals (like pigs) differ from this?
6. How does fermentation differ in hindgut fermenters compared to ruminants?
7. How do chickens mechanically grind their food if they lack teeth? Explain
8. What are the advantages and disadvantages of each type of digestive anatomy? How can this affect management decisions?
9. Hypothesize why pigs and poultry tend to more efficiently convert feed to body weight compared to cattle. Discuss how this relates to the food they can consume.
10. Summarize two key management decisions made by farmers that are directly affected by the digestive anatomy of their livestock.
11. Under what circumstances might a farmer knowingly choose a ration that results in lower animal productivity?
12. What is sustainability and how might the choice of a ration impact this factor?

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Part 2: Project Planning (2.3.2)

Overview: You will choose a specific species and management strategy to use as the basis for your project. Provide APA citations where requested to help you keep track of your sources.

1. What type of livestock species will you focus on? _____

2. Why did you choose this species? _____

   _____

3. Based on your readings, summarize the strategy for how this animal acquires usable nutrients from its feed based on its digestive anatomy. Summarize how this affects its overall feed conversion efficiency:

   _____

   _____

   _____

4. What are the advantages and tradeoffs of this digestive strategy? Consult your readings from this unit.

   Advantages:_____

   Tradeoffs:_____

5. Identify 4–5 key digestive structures in this species. Explain how each changes, moves, or digests feed.

   Key structure: _____ Function: _____

   _____

   Key structure: _____ Function: _____

   _____

   Key structure: _____ Function: _____

   _____

   Key structure: _____ Function: _____

   _____

   Key structure: _____ Function: _____

   _____

6. What ingredients are typically included in feed rations for this species? _____

_____

APA Citation: _____

APA Citation: Last Name, First Name. (Year). Title of Document. URL or Source. *For example: Kohn, Craig. (2026). Livestock Digestion. www.DrKohn.org*

7. Which ration ingredients provide important amounts of each of the following nutrients?

   Protein: _____

   Fats: _____

   Carbohydrates: _____

   Vitamins: _____

   Minerals: _____

   APA Citation(s): _____

   _____

8. Summarize two different options for preparing feed rations (e.g., grassfed vs. feedlot beef; grazing vs. TMR for dairy; pasture vs. hay for horses; etc.). Use your class resources, reference texts, and reliable sources such as university extension, government, or other educational/scientific sources.

   Option 1: _____

   _____

   Option 2: _____

   _____

   APA Citation(s): _____

   _____

   Potential Resources:
   Beef Cattle: OSU State Extension - Grainfed vs. Forage Finishing
   Dairy Cattle: Penn State TMR vs. Pasture
   Swine: Univ of MN Extension - Conventional confinement diet vs. outdoor systems
   Poultry: Univ. of Georgia Extension - Conventional vs. Pasture Broiler Chickens
   Horses: Univ. of MN Extension - Forage-only vs. Forage & Concentrate Feeding

9. Summarize the advantages and tradeoffs of each option you identified in the previous question:

   Option 1: _____

   Advantages:_____

   Tradeoffs:_____

   Option 2: _____

   Advantages:_____

   Tradeoffs:_____

   APA Citation(s): _____

   _____

10. Based on your research, explain how this animal's digestive system, feed ration, and management practices affect its overall *production* and *feed efficiency*. Use the CER Structure below:
    Claim: What should someone understand about feeding and managing this animal?
    Evidence: What information from your research supports this claim? Use reliable sources such as peer reviewed studies and/or government or university extension publications.
    Reasoning: How does the animal's digestive system help to explain the evidence you are presenting?

    Define *production*: _____

    Define *efficiency*: _____

    What is the average feed efficiency for this species? _____ Explain what this means: _____

    _____

    How does the efficiency of this animal compare to other livestock? _____

    _____

    Tip: consider using this source as data.

    APA Citation:_____

    _____

    If you used the suggested source: Hunt, J. & Burns, R. (2024). 2.7.1 Which Type of Livestock is the Most Feed Efficient? In Sustaining Human Life. BYU-I Books.

    How does its digestive anatomy affect its overall efficiency compared to other livestock?_____

    _____

    APA Citation:_____

    _____

11. Which of your two options for preparing feed rations would you recommend for this species?

What quantitative evidence supports your claim?

How does this evidence support your claim?

APA Citation:

Part 3: Poster Development Work Time (2.3.3)

Overview: Use your responses from the previous pages to create an educational poster that teaches another student how digestive anatomy, feed, management, and production efficiency are connected. Use diagrams, labeled models, tables, and brief explanations instead of large blocks of text. Your poster should include:

1. Livestock Overview
    a. Identify the livestock species you are focusing on.
    b. Describe the advantages and tradeoffs of the animal's digestive strategy.
    c. Explain how key parts of the digestive system help the animal acquire nutrients.
2. Feeding & Management
    a. Summarizes a typical feed ration for this species and what nutrients each contributes.
    b. Compare two different feeding or management approaches.
    c. Summarize the advantages and tradeoffs of each.
    d. Support your claims with evidence and reasoning from credible sources.
3. Production & Efficiency
    a. Provide an effective definition or summary of both production and efficiency.
    b. Quantitatively compare the animal's production or feed efficiency with other livestock species.
    c. Explain how each feeding strategy affects production and efficiency.
    d. Support your claims with quantitative evidence and reasoning from credible sources.
4. References: Include an APA reference list.
    a. Use parenthetical in-text citations for important information throughout the poster.
5. Images & Visual Data: Use diagrams, images, tables, graphs, or other visuals to help readers understand the information. Cite images and other visual sources using APA format.

Note: turn in this completed packet with your poster (graded as part of preparation) Rubric on the next page.

Content Criteria	Yes! (5 pts)	Kind of (3–4 pts)	Still Improving (0–2 pts)
1. Livestock Overview	IDs species, details digestive strategy tradeoffs, labels 4–5 key structures, and uses clear diagrams.	IDs species and structures; digestive strategy tradeoffs or diagram explanations are partially complete.	Missing species ID, key anatomical structures, diagrams, or digestive strategy details.
2. Feeding & Management	Maps ration ingredients to nutrients, compares 2 strategy tradeoffs, and evaluates using credible data.	Outlines ration and compares strategies; nutrient mapping or supporting data lacks detail.	Fails to map ration nutrients, compare feeding options, or provide supporting evidence.
3. Production & Efficiency	Defines terms, compares species, and uses CER with quantitative data to evaluate strategy impacts.	Defines terms and shares metrics; species comparison or CER reasoning is limited.	Missing definitions, quantitative metrics, species comparisons, or CER structure.
4. References & Citations	Credible sources; accurate in-text parentheticals, visual image credits, and complete APA reference list.	Minor APA errors; 1–2 claims or images lack required parenthetical citations.	Frequent missing citations, non-credible sources, or missing APA reference list.
5. Professionalism & Presentation	Zero spelling/grammar errors; layout, visual design, and effort reflect adult professional standards.	Minimal spelling/grammar errors; visual layout and effort are neat and organized overall.	Frequent errors; layout appears rushed, unorganized, or lacks professional effort.
6. Completion of Packet 2.3	Packet 2.3 is 100% complete with thorough, well-reasoned responses in all sections.	Packet 2.3 is mostly complete with minor omissions or brief answers in some sections.	Packet 2.3 is largely incomplete or missing multiple required sections.
TOTAL: 30 pts			

Part 4: Project Presentations (2.3.4)

Overview: Your goal is to teach your classmates how digestive anatomy, feed, management, and production are connected. Do not read your poster word-for-word. Use it as a visual guide while you explain the most important ideas. Aim for about 5 minutes. In that time, you should…

1. Introduce your livestock
    a. Identify your species. Briefly explain what makes its diet different from other livestock.
    b. Explain the most important digestive structures and what they do.
    c. Explain how the digestive system affects what the animal can eat and how nutrients are obtained.
2. Explain feeding and management
    a. Describe the main parts of the animal's ration.
    b. Compare your two feeding strategies.
    c. Explain the main advantage and tradeoff of each.
    d. Use evidence from your sources to support your explanation.
3. Explain production and efficiency
    a. Share one or two important numbers from your research.
    b. Explain what the numbers show about production or feed efficiency.
    c. Compare your animal with another species when appropriate.
4. End with your main takeaway
    a. State your main claim about how digestive anatomy influences feeding, management, and production.
    b. Briefly explain why this matters to a livestock producer.

During your presentation

- Point to visuals as you explain them.
- Use scientific vocabulary, but explain unfamiliar terms.
- Do not read large sections of text from the poster.
- Use evidence and numbers to support your ideas.
- Be prepared to answer questions.

Part 5: Career Connections - Writing a Resume (2.3.5)

Overview: A resume is a short, organized summary of your education, experience, skills, accomplishments, and activities. Employers often review resumes when deciding whom to interview before hiring for a job.

Your agriscience classes help you develop skills that can be used beyond the classroom. Employers in agriculture and other careers want people who can communicate clearly, work responsibly, solve problems, and contribute to a team. Your resume gives you a chance to show evidence of these skills.

You may not have much work experience yet, and that's okay. School, FFA, sports, clubs, volunteering, babysitting, family responsibilities, community activities, and other experiences can demonstrate valuable skills. The goal is to identify what you have done and explain what those experiences show about you.

A resume should also be accurate, organized, and professional. Employers use written communication as evidence of how carefully a person works. Creating and revising your resume gives you practice with a skill you will use throughout your education and career.

Initial Ideas - *Record your ideas separately (e.g., on a white board or scratch paper).*
SEP: Engaging in Argument from Evidence

Before creating your own resume, individually examine the example provided on the next page. Then work with a partner or small group and discuss the questions below. Be prepared to share your ideas with the class.

Part A, First Impression: Look at the sample resume for 1–2 minutes without reading every word.

1. What is the first thing you notice? Why do you think the resume is organized this way?
2. What information can you find quickly without reading the entire resume?
3. Does the resume look like something an employer would take seriously? Explain.
4. What makes it easy to read? What would make the resume harder to read?

Part B, What the Resume Communicates: Imagine you are an employer who has never met Mason.

1. After reading the resume, what three things do you know about Mason?
2. What evidence suggests that Mason is: responsible? dependable? willing to learn? collaborative?
3. Which experiences tell you the most about Mason's abilities?
4. Does Mason simply tell the employer that he is responsible and hardworking, or does he provide evidence? Give an example.

Key idea: Strong resumes don't just say, "I am responsible." They show evidence of responsibility.

Part C, Compare these two statements:
A: Worked on a farm. *B: Assist with daily livestock feeding, watering, and animal care.*

1. Which statement gives an employer more useful information? Why?
2. What does the second statement help you picture the student actually doing?
3. Find three action verbs in the resume. What do these verbs tell you about what the student can do?
4. Which experience description gives the strongest evidence of a useful workplace skill? Explain.
5. Why is it better to describe what you actually did rather than simply list the name of a job or activity?

Part D, Wrapping-up

1. Mason is only a sophomore. Does he have enough experience to create a useful resume? Explain.
2. Would the same resume be equally effective for a job at a restaurant or landscaping company? Could he change his resume depending on what kind of job he is applying for?

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MASON KELLER
Burlington, WI | 262-555-0184 | mason.keller@email.com

CAREER OBJECTIVE

Responsible and motivated high school student with experience in agriculture, livestock care, and customer service seeking a part-time position as a veterinary clinic assistant. Eager to contribute to the care and needs of both animals and customers while developing the skills needed for an eventual career as a veterinarian.

EDUCATION

Burlington High School, Burlington, WI
Expected Graduation: June 2029
Agriscience coursework: Introduction to Agriscience, Animal Science
GPA: 3.4

WORK EXPERIENCE

Farm Assistant, Keller Family Farm, Burlington, WI
June 2025–Present

- Assist with daily livestock feeding, watering, and animal care.
- Clean and maintain animal housing, equipment, and work areas.
- Help load, move, and handle livestock safely.
- Complete assigned tasks independently and ask questions when additional direction is needed.
- Work cooperatively with family members and other workers to complete daily chores.

Team Member, Fred's Parkview, Burlington, WI
September 2025–Present

- Provide friendly and respectful service to customers.
- Prepare orders accurately and maintain a clean work area.
- Work with team members to complete tasks during busy periods.
- Handle responsibilities independently after receiving instructions.

EXTRACURRICULAR & LEADERSHIP ACTIVITIES

FFA Sentinel, Burlington FFA | 2025–Present

- Participate in chapter meetings, agricultural activities, and community service projects.
- Prepare and take down for meetings to maintain an orderly and productive room.
- Qualified for state competition in the FFA Veterinary Science Career Development Event.

High School Football, Burlington, WI | 2025–Present

- Participate as a member of the junior varsity team.
- Demonstrate teamwork, responsibility, and commitment through regular practices and competitions.

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SKILLS

- Livestock handling and basic animal care
- Safe use and cleaning of farm equipment
- Basic record keeping and data collection
- Customer service
- Teamwork and communication
- Dependability and time management
- Gmail, Google Docs, Google Slides, Google Sheets

HONORS & ACCOMPLISHMENTS

- Honor Roll, Spring 2025
- FFA community service (roadside cleanup, elementary ag discovery day)
- Completed tractor safety certification
- First-aid & CPR certified

REFERENCES

Mr. Jarod Keller - owner, Keller Family Farm
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262-534-3891
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Mrs. Jane Whitetail, Agriscience Instructor
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262-763-0200
jwhitetail@bhs.us

Mr. Fred Freddington, III
596 N Pine St, Burlington, WI 53105
262-763-8370
fredsparkview@email.com

Creating Your Own Resume
Create a typed, one-page resume that you could actually use when applying for a job, internship, or other opportunity. Organize your resume into appropriate sections. You may use: 1. Contact Information 2. Objective or Career Goal 3. Education 4. Experience 5. Activities & Accomplishments 6. Skills 7. References *Tip: Avoid simply listing what you did. Instead, describe your responsibilities using specific action verbs.*