

LESSON 1.6

Herd Health of Beef and Dairy Cattle

COMPETENCY	STANDARDS
- Demonstrate an understanding of livestock nutrition, health, reproduction, management, and marketing. - Evaluate current issues in animal agriculture.	- AG3.AS2.C.e - AG3.AS3.C.f - AG3.AS4.C.g - AG3.AS5.C.h - AG3.AS6.C.i - LS4.D.3 - ETS1.B.1 - SS.EC.2 - SS.CG.5 - S.ID.6 - A-CED.2 - ELA.RI.3.4 - ELA.WHST.6-12.2

LESSON OBJECTIVES

During the lesson, the student will...

1. Construct a group health monitoring practice for beef and dairy cattle based on recommended best practices.

ENABLING OBJECTIVES

During the lesson, the student will...

1. Construct a quarantine and biosecurity plan for introducing new animals to the herd.
2. Outline local, state, and federal regulations for buying and selling beef and dairy cattle.
3. Use a set of example records for effective group health management.
4. Evaluate the pros and cons of current and emerging health management technologies in the beef and dairy industry.

TIME

210 minutes	OR	5 of 45-minute segments/class periods
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RESOURCES, TOOLS, EQUIPMENT, AND SUPPLIES

- PowerPoint Slides
- Printed handouts and activity sheets
- Pens/Pencils for students

REFERENCES

- Regulatory Agencies & Sources:
 - USDA, Food Safety Inspection Service (FSIS), FDA
 - Meat and Poultry Inspection Program (MPIP) (Missouri-specific)
 - Various state and federal regulatory guidelines on cattle trade and biosecurity
- Additional Educational Resources:
 - South Dakota State University Extension on Calving Records
 - Agricultural health and biosecurity best practices

KEY TERMS

- **Biosecurity**- Measures taken to prevent the introduction and spread of disease in livestock populations.
- **Quarantine**- A period of isolation for new or sick animals to prevent the spread of disease.
- **Vaccination Schedule**- A systematic plan for immunizing cattle against common diseases.
- **Herd Health Monitoring**- Routine observation and documentation of cattle health to identify potential issues early.
- **Culling**- The process of removing animals from the herd due to poor health, genetic defects, or other management decisions.

LESSON OVERVIEW

INTEREST APPROACH

- Students engage in an interactive scenario where they simulate managing a cattle herd. They receive herd health data and must analyze an outbreak, discussing missing information and potential solutions.

OBJECTIVES

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- Throughout the lesson, students will engage in the lesson objectives through activities such as developing health monitoring and biosecurity plans for cattle herds, a hands-on role-playing exercise helps them understand the importance of quarantine procedures, and research assignments to explore state and federal regulations for cattle buying and selling. Students will also analyze cattle health records to make management decisions and complete a final project to evaluate emerging health management technologies.

REVIEW

- Students will share their projects on emerging health management technologies.

INTEREST APPROACH (5 MINUTES)

- Say:** Let's role-play! All of you are now cattle. I am a farmer, and you are my herd. Five of you are new to the herd; I just got you from a cattle sale this morning. The rest of you have been here for years.
- Ask:** What do you think we should do to keep the entire herd healthy? Discuss this with those around you. Write your answers and thoughts as a group.
- Do:** After giving students time to discuss and write things down with their classmates, have students share and discuss their thoughts.
 - Listen for:** We could quarantine the new herd, keep track of the latest cattle, make a biosecurity plan, etc.
- Say:** Today, we are going to begin learning about herd health, everything from what to do with new animals to preventing outbreaks to what records to keep when monitoring the herd.

OBJECTIVE 1: CONSTRUCT A GROUP HEALTH MONITORING PRACTICE FOR BEEF AND DAIRY CATTLE BASED ON RECOMMENDED BEST PRACTICES. (20 MINUTES)

Teaching Strategies	Related Content
Do: Hand out the Handout #1: Herd Health Plan Examples . Say: Let's pretend that your table/desk partners and you are in the cattle industry together. That card has everything you have	Handout #1: Herd Health Plan Examples

recorded for your production. A vet just left your office with news that your herd has an outbreak of an infectious disease, but you think that some of your cattle were vaccinated for it. Look at the information you have as a group. Ask: What information on the card is beneficial going forward? Listen For: Vaccination records, tag numbers, etc. Ask: What information did you wish you had? Listen for: Which cattle were vaccinated, movement records for the cattle, etc. Say: Today we are going to be looking at health monitoring practices, so outbreaks spreading across our herd we discussed at the beginning of the lesson can be quickly assessed and cared for. Do: Show Slide 3: Routine Health Checks. Say: Routine health checks are an important part of operating a cattle herd, and they are the easiest way to monitor the basic health of your cattle. Say: Daily visual inspections are simple observations for situations like unusual behavior, changes in coat, injuries, or lameness in the animal. Regular physical exams are more strenuous, from checking temperature and heart rate to checking body conditioning score, inspecting gums and teeth for diseases, and checking for hoof problems like overgrowth or injury.	Slide 3: Routine Health Checks
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Do: Show Slide 4: Nutrition and Feeding Practices. Say: While laying eyes on your cattle every day is a great step towards monitoring their health, following sound nutrition and feeding practices for your herd is also an important part of ensuring your herd is healthy. Say: Meeting nutritional needs and providing quality feedstuffs, then filling any additional needs by using supplements ensures that the animals are not only going to be at their healthiest, but most productive as well. Say: Monitoring feed and water intake allows a producer to notice any changes that might indicate health problems. Do: Show Slide 5: Vaccination and Deworming. Say: Providing your herd with proper preventative healthcare adds a blanket of security to your herd health plan by planning for diseases that could come. Say: Core vaccinations may vary based on your production type and location, while tailored vaccination plans are more geared towards your specific herd needs. No matter the type of vaccinations you supply, keeping a record of it is important. Deworming is also a preventative practice, often geared with rotating pastures to reduce parasite loads on herds. Do: Show Slide 6: Stress Management.	Slide 4: Nutrition and Feeding Practices Slide 5: Vaccination and Deworming Slide 6: Stress Management
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Say: Just like mental health is important for people, there are parts of herd health that focus on aspects unrelated to their immune systems and injuries, such as stress management. Say: Being able to manage stress in cattle leads to safer work environments, better production, and overall, a better experience for everyone involved. Cattle handlers learn calm practices to handle animals, especially during medical procedures, and producers learn safe ways to load and unload animals from trailers to prevent injury and stress. Say: Stress management starts at home; cattle are much happier when they have shelters to protect them from extreme weather, have comfortable bedding to promote rest, and have sufficient space to move around. Do: Have students complete the exit ticket shown on Slide 7: Objective 1 Exit Ticket. The question for students to answer on this slide is: What are four ways that you can monitor cattle herd health?	Slide 7: Objective 1 Exit Ticket
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OBJECTIVE 2: CONSTRUCT A QUARANTINE AND BIOSECURITY PLAN FOR INTRODUCING NEW ANIMALS TO THE HERD. (30 MINUTES)

Teaching Strategies	Related Content
Do: Before class, print and cut out the cards from Handout #2: Herd Cutouts so they are ready to be used in the lesson. Prepare one complete set of Herd Cutouts before class. They should be placed face down so students cannot read them.	Handout #2: Herd Cutouts

Do: Ask for two volunteers to role-play cattle producers. The rest of the class will be cattle. Give each of the cattle producers a few cattle, then put the rest of them off to the side. Have cutouts from Handout #2: Herd Cutouts set out where they cannot be read. There should be one cut out per students that are playing unpurchased cattle. Say: Each of our cattle producers are looking to buy new cattle. All of you that are separated from the group are available for purchase. One at a time, our cattle producers are going to select cattle they want to buy. Once the producer chooses the animal, they will pick a card from the table and not read it but give it to the person representing the animal they just bought. The producer will decide what to do with the new head of cattle. Do: Allow students to ask questions, but do not give them more information about what they should be doing with the new cattle. Do: Allow students to buy cattle and select a card for each one they have purchased. Ask: Will our newly purchased cattle please read their cards? Listen for: Students to read the biosecurity issues listed on the Herd Cutouts handout. Ask: What do you think about some of the new animals in your herd? Listen for: Some of my new animals are sick.	Handout #2: Herd Cutouts
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Ask: What can happen now? How could this have been prevented? Listen for: The sick cattle could get my other cattle sick. Quarantine and health records could have helped or prevented this. Say: A healthy herd can easily be compromised by a new member, just like in our activity. We are going to look at aspects to consider in quarantine and biosecurity plans when introducing new animals to the herd. Do: Show Slide 8: Quarantine Procedures. Say: There are four basic steps to quarantine procedures every producer should have in place when adding a new animal to the herd. Say: One, the facility should be prepared by ensuring there is a physically separated area to avoid direct contact. The area should be sanitized and easy to disinfect, with proper ventilation. Say: Two, once the animal arrives, an initial health assessment needs to be done thoroughly by a veterinarian, which should include a physical exam and getting their health records. Say: Three, the animal must then go into a monitoring period where they are observed for a minimum of 30 days for any signs of illness. During this, daily health checks should be completed by taking vitals and records should be kept of any observations made.	Slide 8: Quarantine Procedures
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Say: Four, the last step, is testing and treatment of the new animal. Tests need to be completed for common diseases, vaccinations need to be administered based on herd health protocols, and deworming may need to be completed. Ask: How can we make sure that the humans, equipment, etc. going in and out of the quarantine area are not spreading a disease? Listen for: Washing hands, covering clothes, sanitizing equipment, etc. Do: Show Slide 9: Biosecurity Measures. Say: There are several different biosecurity measures that producers should follow to best prevent the spread of diseases before, during, and while integrating the new animal into the herd. Say: The only people who should go into the quarantine area are essential personnel. When they do go in, they should wear proper protective clothing, and make sure to disinfect hands, boots, and equipment before entering and leaving the area. Say: It also helps if dedicated equipment is used instead of using the same equipment as on other animals. Waste management and disposal is also important for preventing contamination, as well as ensuring that rodent and pest control is being implemented to help minimize disease transmission. Say: Before the animal can be brought into the herd, a final health check from a vet should place. After they pass the health	Slide 9: Biosecurity Measures
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check, they are gradually introduced to reduce stress and monitor health for some time after being introduced. Do: Have students complete the exit ticket on Slide 10: Objective 2 Exit Ticket. The question for students to answer is: What are 3 security measures to take when handling a new animal in the quarantine period?	Slide 10: Objective 2 Exit Ticket
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OBJECTIVE 3: OUTLINE LOCAL, STATE, AND FEDERAL REGULATIONS FOR BUYING AND SELLING BEEF AND DAIRY CATTLE. (30 MINUTES)

Teaching Strategies	Related Content
Ask: If I told you I had a steak in a cooler in my car and would sell it to you for \$5, would you buy it? Why or why not? Listen for: Students to respond yes or no and their reasons why (i.e., safety, temperature, don't know where it came from) Ask: If the same steak was at the store for \$5, are you more or less likely to buy it? Why? Listen for: Students to respond yes or no and their reasons why (i.e., bought from store before, refrigeration) Say: While you may not know much about a steak in a cooler in someone's car, there are regulations in place for selling and buying both beef and dairy cattle to ensure that the steak and dairy products we buy at the store are safe, and to ensure that animals are being cared for. You will be doing research on what those regulations are at the state	

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and national level for your type of cattle production as part of your Herd Health and Management Plan. Do: Have students research and complete the Activity #1: Meat Regulations.	Activity Sheet #1: Meat Regulations
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OBJECTIVE 4: USE A SET OF EXAMPLE RECORDS FOR EFFECTIVE GROUP HEALTH MANAGEMENT. (30 MINUTES)

Teaching Strategies	Related Content
Ask: What kind of records might be useful when looking at group health management in cattle herds? Listen for: Vaccination records, grazing records, etc. Say: Farmers rely on records for many aspects of their productions, and there are a lot of different types of records that they keep and are useful to them, just like the records we saw at the beginning of the lesson. We are going to explore what different types of records are kept, as well as different ways they could be useful. Do: Show Slide 11: Basic Records for Beef and Dairy Cattle Health Management. Ask: If we are looking at our herd of cattle, how do we know which has calved? Which cow has been vaccinated? Which one was sick last year? Listen for: Ear tags, identification numbers, etc. Say: Identification records are important, as is using things like ear tags, tattoos, or electronic identification (EID) to track	Slide 11: Basic Records for Beef and Dairy Cattle Health Management

animals. These records are also usually kept with a herd inventory, which is a list of all current animals in a herd, including births, purchases, and sales. Say: Vaccination records, along with disease testing records, are both important records to keep on a herd. It's important to include dates of vaccines or tests, batch numbers, and who gave it. If a test was done, it is important to record the outcome as well. Along those same lines, veterinarian visits should be documented, as well as any additional medical treatments or procedures that need to take place. Always include the date and as many details as needed. Ask: What kinds of information may be included in breeding and calving records? Listen for: When the animal was bred, when the animal calved, how many calves it had, etc. Say: When the animal was bred and when it calved are important records to have, but you also keep track of data like what sire was used to breed, outcomes of breeding if there were more than one attempt, as well as complications during calving. Ask: Why might tracking nutritional information like quantity of food provided, supplements being eaten, or daily food intake be useful records to keep? Listen for: Can monitor for sudden changes in diet, can see if needs are being met, etc. Say: Another important record to keep, specifically for dairy cattle, is logs of their	
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production. Knowing how much milk a cow produces a day, as well as the quality of it, can help in selecting breeding animals and catching health issues quickly based on changes in quality or supply. Say: Health can also be better monitored if good records are kept alongside a biosecurity and quarantine plan, like discussed before. These records would include what animals have been in quarantine, for how long, and any health observations made during that time. Biosecurity records would include documentation of cleaning and disinfection of supplies, as well as a tracking record of pasture grazing. Ask: Why might producers need to keep records of their mortality and culling history? Listen for: Keeping track of herd numbers, monitoring health problems, checking for patterns, etc. Ask: What have we discussed already this lesson that proves that transport and movement records, as well as regulatory compliance records are essential for producers to keep? Listen for: Local, state, and national regulations for buying, selling, and moving cattle Do: Have students complete the Slide 12: Objective 4 Exit Ticket. The prompt for students to complete is: Name three specific types of data cattle producers should keep in their records.	Slide 12: Objective 4 Exit Ticket
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OBJECTIVE 5: EVALUATE THE PROS AND CONS OF CURRENT AND EMERGING HEALTH MANAGEMENT TECHNOLOGIES IN THE BEEF AND DAIRY INDUSTRY. (45 MINUTES)

Teaching Strategies	Related Content
Ask: What are some differences that cattle producers, either dairy or beef, have now compared to 100 years ago? Listen for: Technology, milking machines, artificial insemination, etc. Say: The cattle industry as a whole is growing and developing every day. Many current technologies make the industry more advanced than 10 – 20 years ago, and emerging technologies will take things to the next level. Say: You will each select a current or emerging technology for either beef or dairy cattle and create a presentation to share with your classmates. Do: Pass out Handout #3: Technologies in the Beef and Dairy Industries Rubric Do: Allow students time to create their presentations.	Handout #3: Technologies in the Beef and Dairy Industries Rubric

REVIEW ACTIVITY | (30 MINUTES)

Do: Allow students to share their technologies in the beef and dairy industries presentations to the class as graded presentations.

ASSESSMENT

Consider using the following artifacts from the lesson to assess student learning:

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- Formative Assessment
 - Have students complete an **Exit Ticket for Objective 1** and participate in a group discussion to assess students' ability.
 - Have students complete an **Exit Ticket for Objective 2** and participate in a group discussion to assess students' ability.
 - Have students complete an **Exit Ticket for Objective 4** and participate in a group discussion to assess students' ability.
 - Use **Handout #3: Technologies in the Beef and Dairy Industries Rubric** to assess students' ability in their presentations.
 - Summative Assessment
 - Use **BeefLesson1.6_Assess1** to test student knowledge.
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EXTENDED LEARNING OPPORTUNITIES

Extended Learning Opportunities allow for the primary acquisition of knowledge and skills through instruction or study outside of the traditional classroom, including, but not limited to: Independent study, SAEs, FFA CDEs/LDEs, Internships, guest speakers, and apprenticeships.

Classroom

- Take a field trip to see a veterinarian do a physical exam on either a beef or dairy cow.
- If you have a school farm, have students complete health checks and monitor the cattle for a period of time.

FFA

- Shadow a vet for a semester as they do health checks on herds of cattle.
- Complete an agriscience research project on breed tolerance to certain diseases prevalent in your area.

SAE

- Have students participate in the Dairy Cattle Evaluation CDE, for which knowledge of health is a necessity to complete the knowledge exam.
- Volunteer to do cattle health checks for local farmers for a community service project.

LESSON 1.6

Meat Regulations

Student Name _____ Date _____

DIRECTIONS

Conduct your own research to complete this activity sheet on state and federal meat regulations.

State and Federal Regulations	
What organization is responsible for verifying the safety of meat and poultry products sold to Missouri Consumers?	Meat and Poultry Inspection Program (MPIP)
What health tests must take place to verify the meat's safety?	Meat inspection
Are there specific standards or inspections the cattle/product must meet if they are being sold at markets?	Those interested in selling meat should contact the compliance investigator and fill out registration.
What documentation and tests must be provided for the transport of animals?	All animals entering Missouri shall be accompanied by an official Certificate of Veterinary Inspection (CVI, health certificate) issued within 30 days prior to movement into Missouri unless moving to an approved slaughter facility or to an approved livestock market. All health certificates must have the physical address of livestock being moved (No post office boxes) for both the consignor and consignee.
What organizations are responsible for ensuring the United States meat supply is safe?	USDA, Food Safety Inspection Service (FSIS), FDA

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Assessment

Student Name _____. Date _____

DIRECTIONS

Answer the questions below.

1. Which of the following options best describes the integration of principles needed to manage a small family farm raising cattle that is facing issues with inconsistent cash flow, underutilized assets, and difficulties managing its team while also considering herd expansion?
 - a. Focus solely on increasing the herd size to boost profitability and manage cash flow through increased sales.
 - b. Develop a plan that includes improving cash flow through better budgeting, analyzing profitability before expanding, optimizing asset usage, identifying growth opportunities, and implementing effective team management practices.**
 - c. Prioritize asset management by selling underutilized equipment to generate cash flow. Use the funds to hire more staff for better team management.
 - d. Advise the farm to avoid expansion until it has resolved all current issues, focusing only on cash flow management.
2. Scenario: You have just been hired as a manager for a local beef cattle farm. Create a plan (schedule) of what health monitoring you will do on a daily, weekly, and monthly basis. Include 3 daily tasks, 3 weekly tasks, and 3 monthly tasks.

Answers will vary, but look for something like:

- ☐ **Daily:** Observe herd behavior, check water access, and record daily feed intake
 - ☐ **Weekly:** Check feed quality, hood inspections, vital sign checks of sick animals
 - ☐ **Monthly:** Vaccinate as needed, Deworm as needed, pasture rotation as needed
3. Scenario: The farm that you manage just got three new cows from a cattle auction. Explain at least two things that would be included in your quarantine and biosecurity plan for each of the following:

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- Preparing for Arrival
- Arrival
- Time in Quarantine
- Joining Herd

Answers will vary, but look for something like:

1. Preparing for arrival: Sanitize the area, and make sure there is ventilation in the quarantine area
2. Arrival: Have the veterinarian do an initial inspection of health, review health records

Time in quarantine: Test for diseases, restrict access to essential personnel only

4. Identify three local, state, or federal regulations for buying and selling beef and dairy cattle.

Answers will vary

5. Summarize a current or emerging technology related to health in the cattle industry. Make sure to include at least one pro and one con in your summary.

Answers will vary