

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Introduction to Dairy Production
<b>Lesson</b>	Herd Health
<b>Estimated Time</b>	90 minutes or two 50-minute blocks

### Student Outcome

Develop a herd health program.

### Learning Objectives

1. Describe the common herd health problems in lactating dairy animals.
2. Explain how mastitis is prevented and controlled.
3. Describe the common herd health problems in raising replacement heifers.
4. Explain how medications are administered.

### Grade Level Expectations

SC/ST/3/B/09-11/a

SC/ST/3/B/09-11/b

SC/ST/3/B/09-11/c

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. PowerPoint Slides
  - ☐ PPt 1 - Health Problems in Lactating Dairy Animals
  - ☐ PPt 2 - Routes of Administration
2. Activity Sheet
  - ☐ AS 1 - California Mastitis Test (CMT)
3. *Introduction to Dairy Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
4. *Introduction to Dairy Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplies & Equipment

- ☐ Mastitis-infected milk sample from local dairy producer
- ☐ Store-bought milk sample
- ☐ Materials for California Mastitis Test (CMT)

#### Supplemental Information

1. Internet Sites
  - ☐ Dairy Publications. MU Extension. University of Missouri-Columbia. Accessed April 12, 2007, from <http://extension.missouri.edu/explore/agguides/dairy/>.
  - ☐ Harris, B., and J. K. Shearer. *Raising Dairy Replacement Heifers*. University of Florida, IFAS Extension. Accessed August 30, 2007, from <http://edis.ifas.ufl.edu/DS150>.
  - ☐ Heifer Management Featured Articles. TheDairySite. Accessed August 30, 2007, from <http://www.thedairysite.com/articles/cat18/heifer-management>.
  - ☐ Production and Management Featured Articles. TheDairySite. Accessed August 30, 2007, from <http://www.thedairysite.com/articles/cat25/production-and-management>.

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- ❑ Waldner, D. N., J. Kirkpatrick, and T. W. Lehenbauer. *Recommended Vaccination Schedules for a Comprehensive Dairy Herd Health Program*. Accessed August 30, 2007, from <http://osuextra.okstate.edu/pdfs/F-4354web.pdf>.
2. Print
- ❑ Andrews, A. H. *The Health of Dairy Cattle*. Blackwell Publishing Limited, 2000.
  - ❑ Thomas, H. S. *Getting Started with Beef and Dairy Cattle*. North Adams, MA: Storey Publishing, LLC, 2005.
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### Interest Approach

Obtain a mastitis-infected milk sample from a local dairy producer and a sample of store-bought milk. Have students describe the differences and their impressions of the two milk samples.



### Communicate the Learning Objectives

1. Describe the common herd health problems in lactating dairy animals.
2. Explain how mastitis is prevented and controlled.
3. Describe the common herd health problems in raising replacement heifers.
4. Explain how medications are administered.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>Ask students what the common herd health concerns in lactating dairy cattle are. Use PPt 1 as a guide for discussion.</i></p> <p><input type="checkbox"/> PPt 1 - Health Problems in Lactating Dairy Animals</p>	<p><b>Describe the common herd health problems in lactating dairy animals.</b></p> <p>Milk fever</p> <ol style="list-style-type: none"><li>1. Results from a calcium imbalance and involves abnormally low levels of calcium in the blood</li><li>2. Causes loss of appetite, staggering, and paralysis; can cause death if untreated</li><li>3. Treated with an intravenous injection of calcium by a veterinarian</li><li>4. Prevented by feeding dry cows rations with correct levels of calcium and phosphorus</li></ol> <p>Ketosis</p> <ol style="list-style-type: none"><li>1. Results from underfeeding during the period of high lactation shortly after calving</li><li>2. Causes reduced milk production, weight loss, and a fruity odor to the breath and milk</li><li>3. Treated with injections of glucose or hormones</li><li>4. Prevented by feeding high energy diets to lactating dairy cattle</li></ol> <p>Foot rot</p> <ol style="list-style-type: none"><li>1. Caused by a wound between the toes</li><li>2. Causes lameness, swelling, fever, decreased appetite, and a sharp decrease in milk production</li><li>3. Treated with foot baths and antibiotics</li></ol> <p>Hairy heel warts</p> <ol style="list-style-type: none"><li>1. Causes an extremely painful growth on the skin on the heels of the rear feet</li><li>2. May cause animals to avoid putting weight on their</li></ol>

Instructor Directions	Content Outline
	<p>heels; also associated with decreased milk production</p> <ol style="list-style-type: none"> <li>May be treated with the use of antibiotic sprays on the affected area</li> </ol> <p>Laminitis</p> <ol style="list-style-type: none"> <li>Caused by high concentrate levels combined with insufficient levels of long fiber from forages for adequate cud chewing, which creates acidic conditions in the rumen</li> <li>Causes lameness and poor milking performance</li> <li>Can be prevented by careful management of feeding; may also require aggressive foot trimming</li> </ol> <p>Mastitis</p> <ol style="list-style-type: none"> <li>Causes the greatest economic losses</li> <li>Caused by bacteria entering the udder through the teat or an injury to the cow's udder</li> <li>Clinical or acute mastitis – causes a severely swollen udder, bloody or clotted milk, loss of appetite, and severe reduction in milk production</li> <li>Subclinical or chronic mastitis – causes decreased milk production and an elevated somatic cell count, although the milk appears to be normal to the herd manager</li> </ol>
<p><b>Objective 2</b></p> <p><i>Ask the class to list ways to prevent and control mastitis. Emphasize the fact that mastitis is the single biggest dairy health problem. Have students complete the California Mastitis Test on AS 1.</i></p> <p> AS 1 – California Mastitis Test (CMT)</p>	<p><b>Explain how mastitis is prevented and controlled.</b></p> <p>Prevention</p> <ol style="list-style-type: none"> <li>Proper sanitation <ol style="list-style-type: none"> <li>Milking equipment must be sanitary to keep cows from being infected by milking units.</li> <li>Before milking, milkers should strip the teats, removing a small amount of milk that is higher in bacteria.</li> <li>They should then wash and dry the teats before attaching the milking units.</li> <li>After milking, they should dip the teats in an acceptable disinfectant.</li> <li>Milkers may also predip the teats before milking instead of washing them.</li> </ol> </li> <li>Testing for subclinical mastitis <ol style="list-style-type: none"> <li>Producers should give tests at least once every month to detect the high somatic cell counts caused by subclinical mastitis.</li> </ol> </li> </ol>

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	<ul style="list-style-type: none"> <li>b. Producers can administer the California Mastitis Test.</li> <li>c. Laboratory tests can be used to determine somatic cell counts more accurately.</li> </ul> <p>3. Prevention of infections during the dry period – Producers treat the cow’s mammary glands with long-lasting antibiotics that will combat infections that may be present and prevent mastitis.</p> <p>Treatment</p> <ul style="list-style-type: none"> <li>1. One treatment is frequent milking of the cow; the toxins causing the infection can be milked out with repeated milkings.</li> <li>2. Some producers give cows an injection of oxytocin, which is a naturally occurring hormone causing milk secretion; the additional oxytocin allows the cow to be more completely milked out with a normal milking routine.</li> <li>3 They may also give cows antibiotics to treat mastitis; however, they must discard the milk from cows treated with most antibiotics.</li> </ul>
<p><b>Objective 3</b></p> <p><i>Ask students what the common health problems in raising replacement heifers are. Write suggestions on the board or overhead.</i></p>	<p><b>Describe the common herd health problems in raising replacement heifers.</b></p> <p>Diarrhea, or scours, is the biggest health concern; it causes dehydration if not treated properly.</p> <p>Brucellosis</p> <ul style="list-style-type: none"> <li>1. Brucellosis causes abortions, sterility, and reduced milk production.</li> <li>2. Heifers should be vaccinated at four to seven months of age.</li> </ul> <p>Leptospirosis</p> <ul style="list-style-type: none"> <li>1. Leptospirosis causes abortions.</li> <li>2. Heifers should be vaccinated against leptospirosis and other reproductive diseases before breeding.</li> </ul> <p>Other diseases</p> <ul style="list-style-type: none"> <li>1. Bovine rhinotracheitis (IBR)</li> <li>2. Pasteurella (PI3)</li> <li>3. Bovine viral diarrhea (BVD)</li> <li>4. Blackleg</li> </ul>

Instructor Directions	Content Outline
	5. Heifers should be vaccinated between weaning and eight months of age, with boosters given as appropriate.
<p><b>Objective 4</b></p> <p><i>Ask students to describe how medications should be administered to dairy cattle. Use PPt 2 to illustrate different routes of administration.</i></p> <p> PPt 2 – Routes of Administration</p>	<p><b>Explain how medications are administered.</b></p> <ol style="list-style-type: none"> <li>1. Intramuscular (IM) – administered into the muscle; should be given in the neck</li> <li>2. Subcutaneous (Sub-Q) – administered between the skin and muscle; should be given in the loose skin on the side of the neck</li> <li>3. Oral – given by mouth</li> <li>4. Intranasal (IN) – given as a nasal spray</li> <li>5. Intravenous (IV) – given directly into the jugular vein</li> </ol>
<p><b>Application:</b></p> <p> AS 1 – California Mastitis Test (CMT)</p>	<p>Answers to AS 1</p> <p>Scores should be based on student participation.</p> <p>Other activities:</p> <ol style="list-style-type: none"> <li>1. Conduct a research project with a local dairy producer on the incidence of mastitis in his or her herd and the control measures used to prevent it.</li> <li>2. Profile various medications used in beef and dairy cattle. Note the restrictions for lactating and nonlactating cows.</li> </ol>
<p><b>Closure/Summary</b></p>	<p>Dairy producers must be able to detect and treat herd health problems. Mastitis is the most serious dairy herd health problem. Other diseases that affect lactating cows are milk fever and ketosis. Replacement heifers also have specific health concerns. Medicines must be used correctly when treating these diseases.</p>
<p><b>Evaluation: Quiz</b></p>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. b</li> <li>2. b</li> <li>3. a</li> <li>4. c</li> <li>5. d</li> <li>6. b</li> <li>7. Subcutaneous injections should be given between the skin and muscle in the loose skin on the side of the neck.</li> <li>8. The symptoms of subclinical mastitis are decreased</li> </ol>

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	milk production and an elevated somatic cell count.