

Course	Agricultural Science I
Unit	Introduction to Beef Production
Lesson	Principles of Beef Cattle Selection
Estimated Time	90 minutes or 2-50 minute blocks

Student Outcome

Utilize the available information to select beef cattle.

Learning Objectives

1. Identify the parts of a beef animal.
2. Identify the wholesale cuts of beef.
3. Determine the criteria used in the selection of slaughter and feeder cattle.
4. Determine the criteria used in the selection of breeding cattle.
5. Explain the difference between crossbred and purebred breeding systems.

Grade Level Expectations

SC/EC/3/B/09-11/a SC/LO/3/E/09-11/a

SC/LO/3/B/09-11/d SC/LO/3/E/09-11/c

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. PowerPoint Slides
 - ☐ PPt 1 – Parts of a Beef Animal
 - ☐ PPt 2 – Wholesale Cuts of Beef
 - ☐ PPt 3 – Thickness
 - ☐ PPt 4 – U.S.D.A. Grades for Feeder Steers
2. Activity Sheets
 - ☐ AS 1 – Parts of a Beef Animal
 - ☐ AS 2 – Calculating Adjusted Weaning Weights
 - ☐ AS 3 – EPDs and the Performance of Limousin Bulls
3. *Introduction to Beef Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
4. *Introduction to Beef Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- ☐ Picture of a champion market steer from a major show

supplemental Information

1. Internet Sites

- ❑ Animal Science Publications. MU Extension. University of Missouri-Columbia. Accessed June 28, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/>.
- ❑ TheBeefSite.com. 5M Enterprises, LTD. Accessed June 28, 2007, from <http://www.thebeefsite.com/articles/>.
- ❑ Livestock and Forages Publications. Cooperative Extension Service. University of Arkansas, Division of Agriculture. Accessed June 28, 2007, from <http://www.aragriculture.org/livestock/publications.htm>.
- ❑ "Retail Beef Cuts, Yellowsheet.com." Stewart-Miller Incorporated. Accessed June 28, 2007, from <http://www.yellowsheet.com/retail/>.
- ❑ "Beef Cuts." Certified Angus Beef, LLC. Accessed June 28, 2007, from <http://www.certifiedangusbeef.com/chef/cuts.php>.
- ❑

2. Print



- ❑ Field, T. G. and R. E. Taylor. *Beef Production Management and Decisions*. 5th Ed. Upper Saddle River, NJ: Prentice Hall, 2006.
 - ❑ Ensminger, M.E. *Beef Cattle Science*. 7th Ed. Upper Saddle River, NJ: Prentice Hall, 2002.
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Interest Approach

1. Show a picture of a champion market steer from a major show (e.g., the Missouri State Fair) from a trade magazine or semen catalog. Discuss the value that the steer generated and how selection was a key to its success.
2. Allow students to participate in judging contests. Many area, district, and state livestock judging contests are open to agricultural education students.


Communicate the Learning Objectives

1. Identify the parts of a beef animal.
2. Identify the wholesale cuts of beef.
3. Determine the criteria used in the selection of slaughter and feeder cattle.
4. Determine the criteria used in the selection of breeding cattle.
5. Explain the difference between crossbred and purebred breeding systems.

Instructor Directions	Content Outline
Objective 1 <i>Display PPt 1 and pass out AS 1 to students. While correctly labeling the diagram, discuss the importance of knowing the correct terms for various parts of the beef animal. Confusion can arise from trying to describe an animal using incorrect terminology.</i>  PPt 1 – Parts of a Beef Animal  AS 1 – Parts of a Beef Animal	Identify the parts of a beef animal. <ol style="list-style-type: none">1. Muzzle2. Face3. Eye4. Poll5. Throat6. Dewlap7. Hoof8. Dewclaw9. Cannon bone10. Knee11. Forearm12. Brisket13. Shoulder14. Loin15. Heart girth16. Ribs17. Belly18. Flank19. Hock20. Round21. Rump22. Hip bone23. Tail head24. Pin bones25. Twist26. Cod/udder27. Switch

Instructor Directions	Content Outline
<p>Objective 2</p> <p><i>Discuss the difference between a wholesale and retail cut of meat. Display PPt 2 and discuss the different cuts of beef. Emphasize that the purpose of raising beef cattle is for food. Stress the fact that producers are not producing cattle but beef for human consumption.</i></p> <p><input type="checkbox"/> PPt 2 – Wholesale Cuts of Beef</p>	<p>Identify the wholesale cuts of beef.</p> <ol style="list-style-type: none"> 1. Round 2. Sirloin 3. Short loin 4. Rub 5. Chuck 6. Flank 7. Short plate 8. Brisket 9. Fore shank
<p>Objective 3</p> <p><i>Ask students to describe the difference between slaughter cattle and feeder cattle. Survey students about what characteristics would be important to each type of animal. As an example of muscling, display PPt 3.</i></p> <p><input type="checkbox"/> PPt 3 – Thickness</p> <p><i>While discussing feeder cattle frame size, display PPt 4 to demonstrate the USDA grading</i></p>	<p>Determine the criteria used in the selection of slaughter and feeder cattle.</p> <p>Slaughter cattle</p> <ol style="list-style-type: none"> 1. Muscling <ol style="list-style-type: none"> a. Thicker cattle have more muscle thickness and width along their top line and through their rump and stifle. b. Observe the size of the forearm, the thickness along the top of the calf, and thickness and depth of the quarter. 2. Size <ol style="list-style-type: none"> a. Size suggests the potential carcass weight of the animal. b. Packers prefer a carcass weight of 600 to 850 pounds with a live weight between 1,000 and 1,250 pounds. 3. External Fat <ol style="list-style-type: none"> a. Cattle must have 1/2 inch or less of external fat at the 12th and 13th rib area to have the potential to reach choice-quality grade. b. Steers and heifers will have a smooth appearance along the ribs, pones of fat opposite the pin bones, and evidence of fat on the cod or udder region and through the brisket. <p>Feeder Cattle</p> <ol style="list-style-type: none"> 1. Frame size <ol style="list-style-type: none"> a. Frame size is determined by looking at height in

Instructor Directions	Content Outline
<p><i>system for frame size and muscling.</i></p> <p>📄 PPT 4 – USDA Grades of Feeder Steers</p>	<p>relation to age.</p> <ol style="list-style-type: none"> b. Feeder steers and heifers may have a large, medium, or small frame. c. Frame size is based on a prediction of what the live weight of the calf will be when it has 1/2 inch of external fat in the 12th and 13th rib area. <p>2. Muscling</p> <ol style="list-style-type: none"> a. Feeder steers and heifers may have a muscle score of 1, 2, or 3, with the lower number indicating the more muscular animal. b. Scores depend on the animal's thickness.
<p>Objective 4</p> <p><i>Ask students why selecting breeding animals carefully is important. Stress that breeding animals will have a long-term impact on a producer's herd because of females kept as replacements. Have students complete AS 2 and AS 3 after discussing EPDs.</i></p> <p>📄 AS 2 – Calculating Adjusted Weaning Weights</p> <p>📄 AS 3 – EPDs and the Performance of Limousin Bulls</p>	<p>Determine the criteria used in the selection of breeding cattle.</p> <ol style="list-style-type: none"> 1. Skeletal – ease of movement <ol style="list-style-type: none"> a. Taking long strides off both ends of the skeleton b. Filling its track c. Setting feet down square and wide 2. Volume/capacity <ol style="list-style-type: none"> a. Deep sided b. Wide ribbed c. Spring or curvature of rib cage 3. Muscling – Heavily muscled 4. Balance <ol style="list-style-type: none"> a. Long bodied b. Level topped c. Uniform in depth d. Stout boned e. Clean fronted 5. Performance values <ol style="list-style-type: none"> a. Actual weights – birth weight, weaning weight, yearling weight b. Feed to gain rations 6. Frame score – height in relation to age <ol style="list-style-type: none"> a. Males larger than females b. Range from one to ten, with five to seven considered ideal 7. EPDs – expected progeny differences <ol style="list-style-type: none"> a. Birth weight (BW) EPD – prediction in pounds of the difference in birth weights b. Weaning weight (WW) EPD – prediction of the difference in pounds in weaning weights c. Yearling weight (YW) EPD – difference in pounds at one year of age

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	<p>d. Milk (M) EPD – difference in pounds in the weaning weights of the calves produced by the parent’s female offspring due to the milk production of the cow</p>
<p>Objective 5</p> <p><i>Ask students about the importance of proper selection for commercial producers using crossbreeding and for purebred breeders. For which is it more important?</i></p>	<p>Explain the difference between crossbred and purebred breeding systems.</p> <p>Crossbred</p> <ol style="list-style-type: none"> 1. Crossbreeding is mating in their herd animals of different breeds to take advantage of their different characteristics and produce offspring that display heterosis, or hybrid vigor. 2. Producers buy purebred bulls to use. 3. Most producers sell feeder calves or retain ownership through the feedlot. 4. Daughters of bulls are kept as replacements. <p>Purebred</p> <ol style="list-style-type: none"> 1. Breeders use registered bulls and females of the same breed to produce bulls and females that will be purchased by other purebred breeders and commercial producers.
<p>Application:</p> <p> AS 1 – Parts of a Beef Animal</p>	<p>Answers to AS 1</p> <ol style="list-style-type: none"> 1. Poll 2. Eye 3. Face 4. Muzzle 5. Throat 6. Dewlap 7. Brisket 8. Forearm 9. Knee 10. Cannon bone 11. Dewclaw 12. Flank 13. Hock 14. Switch 15. Round 16. Pin bones 17. Tail head 18. Rump 19. Hip bone

Instructor Directions	Content Outline
<p>AS 2 – Calculating Adjusted Weaning Weights</p> <p>AS 3 – EPDs and the Performance of Limousin Bulls</p>	<p>20. Loin 21. Shoulder 22. Belly 23. Ribs 24. Heart girth 25. Hoof 26. Cod/udder 27. Twist</p> <p>Answers to AS 2</p> <p>1. $\frac{600 - 75}{180} \times 205 + 75 + 0 = 673 \text{ lbs.}$ 2. $\frac{480 - 90}{180} \times 205 + 90 + 20 = 554 \text{ lbs.}$ 3. $\frac{390 - 70}{210} \times 205 + 70 + 54 = 436 \text{ lbs.}$ 4. $\frac{690 - 80}{210} \times 205 + 80 + 54 = 729 \text{ lbs.}$ 5. $\frac{515 - 79}{211} \times 205 + 79 + 40 = 543 \text{ lbs.}$</p> <p>Answers to AS 3</p> <p>1. 2, 1, 4, 3 BW EPDs, low to high 2. 3, 4, 1, 2 WW EPDs, high to low 3. 4, 3, 1, 2 YW EPDs, high to low, or fastest growth to slowest growth. Cattle will be over one year of age when sold, so the YW EPD will be expressed.</p> <p>Other Activities:</p> <p>1. Use EPD information for a judging class. 2. Show a video on selection and judging.</p>
Closure/Summary	<p>Selecting feeder, slaughter, or breeding animals is a complex task. Producers can make wise choices if they keep in mind the traits needed by productive animals.</p>
Evaluation: Quiz	<p>Answers:</p> <p>1. d 2. g 3. i 4. b 5. h 6. e 7. a</p>

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	<ul style="list-style-type: none"> 8. c 9. f 10. j 11. d 12. b 13. a 14. Answers may include any three of the following: soundness, volume/capacity, muscling, balance, performance values, frame size, or EPDs. 15. Producers use crossbred breeding systems to take advantage of the characteristics of different breeds and produce offspring that display heterosis, or hybrid vigor.