ACTIVITY

1. Display images of Angus and Herford cattle. Describe the unique physical characteristics of these breeds including size, color, etc. Discuss with students how and why these cattle look different (from their parents!)

2. Give each student a Build a Calf worksheet. Read the directions together and demonstrate one or more “flips” and the resulting traits so students know what to do.

3. Students can work alone, in pairs, or in groups to complete the Build a Calf Worksheet.

4. Give each student a “Congratulations” calf color page. Instruct them to color the calf according to the results on their Build A Calf Worksheet.

5. Have students compare their offspring to the breed pictures. Does their calf look more like an Angus or Hereford? What genes determine this?

6. Have a discussion with students on the importance of traits and heredity in beef cattle and animals. Some potential discussion questions include:
   a. What are some traits that farmers or ranchers might select for? How does this effect consumers (people eating the meat)?
   b. If you are raising cattle in an arid desert, what traits might you select for? What might help your animals be more successful in this environment?
   c. Do the traits we played the game for directly affect the animal’s use for consumers? What are some traits that might? Is there a way to select for traits that would focus on nutrition or healthfulness?
   d. Are beef producers the only farmers that need to worry about genetics? Are there traits in corps of other livestock that are important? What might some of those be?

CLASSROOM CONNECTIONS

Science

Research and discuss with students examples of how selective breeding and genetics have improved agricultural animals.

Continued
Health
Investigate the recommended portion size for beef products and the nutritional content of these items.

ACADEMIC STANDARDS

Minnesota Science Standards and Benchmarks
3.4.3.2.1 Give examples of likenesses between adults and offspring in plants and animals that can be inherited or acquired.

5.4.1.1.1 Describe how plant and animal structures and their functions provide an advantage for survival in a given natural system.

National Agricultural Literacy Outcomes
T4. 3-5c Identify examples of how the knowledge of inherited traits is applied to farmed plants and animals in order to meet specific objectives (i.e., increased yields, better nutrition, etc.)

ADDITIONAL RESOURCES

Book: Beef Cattle in the Story of Agriculture by Susan Anderson and JoAnne Buggey


Adapted from Iowa Ag Literacy Foundation
BUILD A CALF WORKSHEET

Flip the coin to find out which traits the parents will pass on to their offspring. The parents are a male (bull) and female (cow). The offspring is called a calf. Each parent gives one gene (example B or b). The combination of two genes, one from each parent, creates a trait combination that causes an observable characteristics. For example, BB = a black coat.

**Cow Characteristics**
- Female = XX
- Polled (no horns) = Pp
- Red = bb
- Spotted = ss

**Bull Characteristics**
- Male = XY
- Polled (no horns) = Pp
- Black = BB
- Solid = SS

**Calf Characteristics**
Flip the coin and record your results in the blanks. Circle the trait combination for your calf.

**MALE OR FEMALE**
- Mother’s gene passed on to offspring:
  - Heads = X Tails = X
  - Coin Flip = 
- Father’s gene passed on to offspring:
  - Heads = X Tails = Y
  - Coin Flip = 
- Circle the trait combination of your calf:
  - XX = Female      XY = Male

**POLLED OR HORNED**
- Mother’s gene passed on to offspring:
  - Heads = P Tails = p
  - Coin Flip = 
- Father’s gene passed on to offspring:
  - Heads = P Tails = p
  - Coin Flip = 
- Circle the trait combination of your calf:
  - PP = Polled   Pp = Polled   pp = Horned

**RED OR BLACK COAT**
- Mother’s gene passed on to offspring:
  - Heads = b Tails = b
  - Coin Flip = 
- Father’s gene passed on to offspring:
  - Heads = B Tails = B
  - Coin Flip = 
- Circle the trait combination of your calf:
  - BB = Black   Bb = Black   bb = Red

**SOLID OR SPOTTED COAT**
- Mother’s gene passed on to offspring:
  - Heads = s Tails = s
  - Coin Flip = 
- Father’s gene passed on to offspring:
  - Heads = S Tails = S
  - Coin Flip = 
- Circle the trait combination of your calf:
  - SS = Solid   Ss = Solid   ss = Spotted

Fill in each blank to describe your calf:
- Gender ________________________________
- Horned or Polled (no horns) ______________
- Color of coat __________________________
- Solid or spotted coat ____________________
BUILD A CALF BREED PICTURES:
HEREFORD