Station 1:
Milk Production

1 Read the background information on selective breeding and milk production in the dairy industry.

2 Study the milk production scenario. How can selective breeding benefit this dairy farmer?

3 Analyze each of the dairy cows and their annual milk production. Which four cows should be selected for breeding purposes?

Station 1:
Milk Production
Background Information

One trait a dairy farmer desires in his/her cows is high milk production. This allows farmers to produce more milk for a growing population in the most sustainable manner for our environment. Holstein cows are known for producing high amounts of milk—making them the most popular dairy breed.

Through **selective breeding**, dairy farmers select their top-producing cows who produce high amounts of milk each year. High producing cows will pass on their milk production traits to future generations.
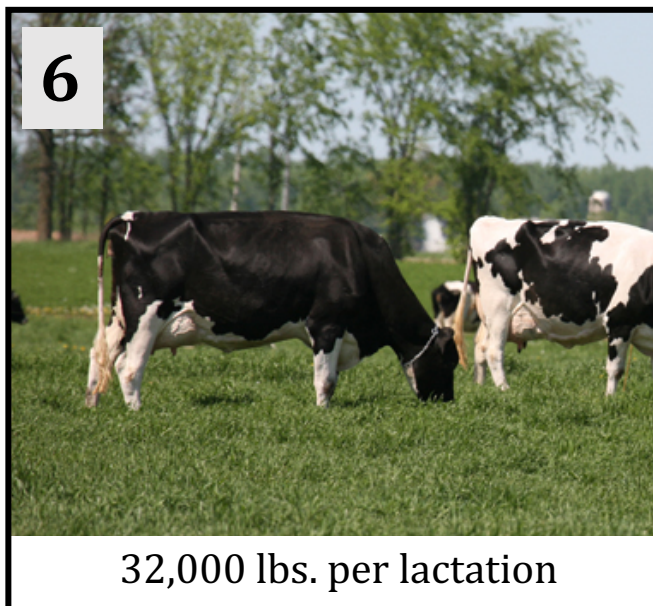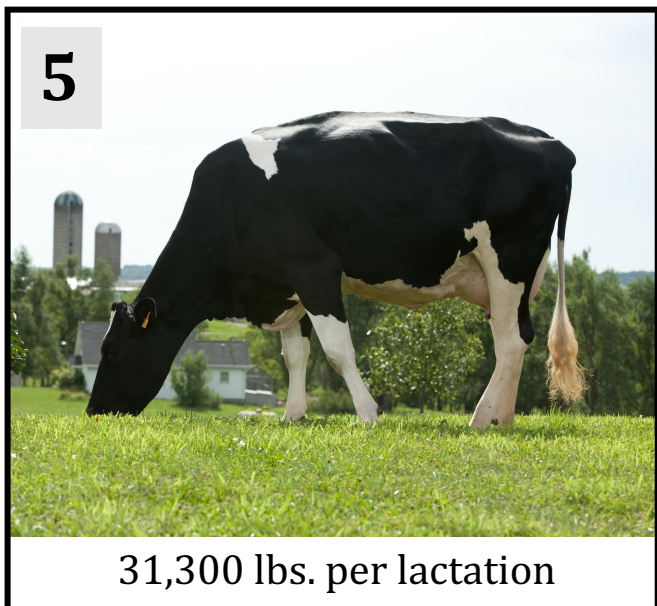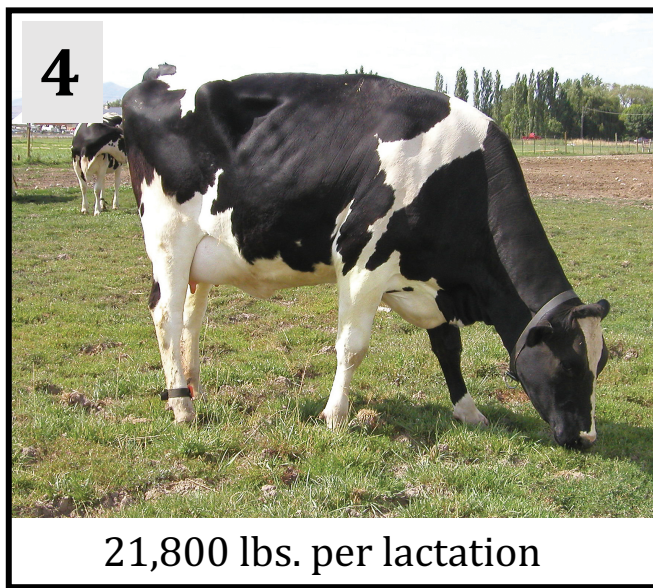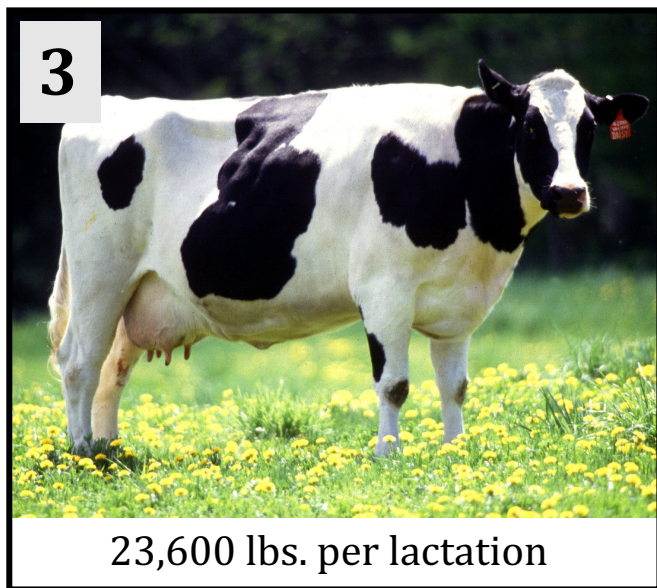
Station 1:
Milk Production Scenario

John is a local dairy farmer looking to increase his herd's milk production with the next generation of calves. He measures his cows' milk production by the pound, per lactation period. A lactation period typically lasts 305 days.

John has six remaining cows left to choose from. Which four cows should he select and breed if he wants to improve the herd's future genetics and increase milk production?

1 19,000 lbs. per lactation

2 24,500 lbs. per lactation

3 23,600 lbs. per lactation

4 21,800 lbs. per lactation

5 31,300 lbs. per lactation

6 32,000 lbs. per lactation
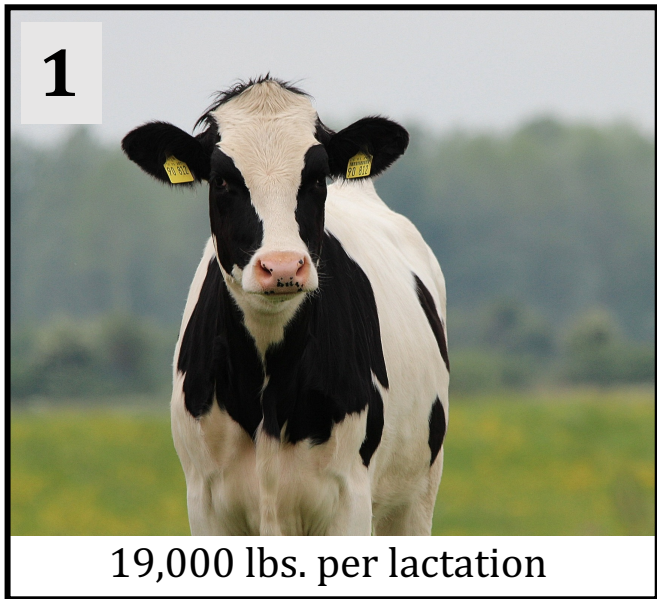
Station 2:
Butterfat Content

1   Read the background information on selective breeding and butterfat content in the dairy industry.

2   Study the butterfat content scenario. How can selective breeding benefit this dairy farmer?

3   Analyze each of the dairy cows and their butterfat production. Which four cows should be selected for breeding purposes?

Station 2:
Butterfat Content
Background Information

Besides measuring how many pounds of milk a cow produces, dairy farmers also measure the protein and butterfat content of their herd's milk supply. Jersey cows are known for high butterfat content in their milk. Dairy farmers use **selective breeding** to select cows who produce high amounts of butterfat. This helps improve the butterfat content in the herd's milk supply.

High butterfat content in milk is a desirable trait because it helps produce quality cheese. Cheese processing companies often purchase milk that is high in butterfat.

Station 2:
Butterfat Content Scenario

Carrie manages a dairy farm with Jersey cattle.

A local cheese processing company buys milk from Carrie, so she would like to keep her herd's butterfat content high. Which four cows should she keep in her herd for breeding and milk production?
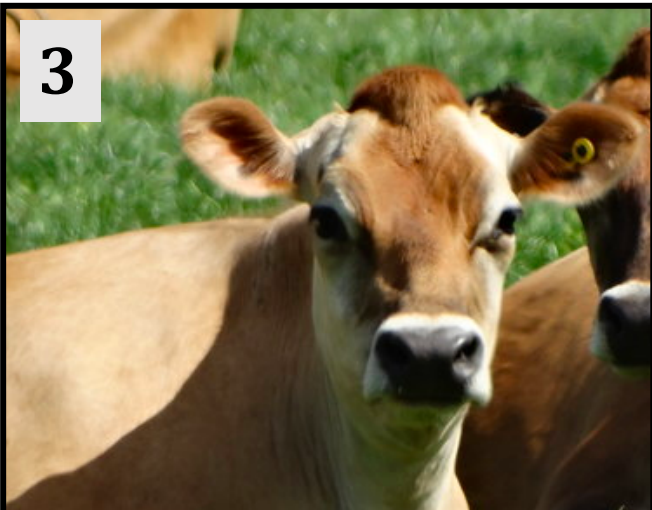
1 4.6% butterfat/100 lbs. of milk

2 3.7% butterfat/100 lbs. of milk

3 3.9% butterfat/100 lbs. of milk

4 4.1% butterfat/100 lbs. of milk

5 4.4% butterfat/100 lbs. of milk

6 3.2% butterfat/100 lbs. of milk

Station 3
Birthweight and Weaning Weight

1 Read the background information on selective breeding, birthweight, and weaning weight in the beef industry.

2 Study the birthweight and weaning weight scenario. How can selective breeding benefit this beef producer?

3 Analyze each of the Angus bulls and their predicted offspring weights. Which bull should be selected for breeding purposes?

Station 3
Birthweight and Weaning Weight Background Information

In beef production, the birthweight of calves is often taken into consideration when selecting breeding bulls. Calves with very high birthweights (>90 pounds) can cause problems for young heifers (cattle who have never given birth before) and small cows. If the calf is too big, this causes problems during birth for the cow and calf, which can lead to serious complications or death.

Detailed records are kept on bulls and the average birthweight of a bull's offspring can be predicted based on the bull's genetics.

In beef production, many producers sell their calves in the fall after they have been weaned. This means they no longer receive milk from their mothers.

Typically, calves weigh about 600-700 pounds at weaning. Beef producers are paid by the pound, so a high weaning weight is a desirable trait sought after when breeding cattle. ($1.50 per lb. for a 600 lb. calf = ?)

Birthweights and weaning weights are both considered highly heritable traits.

Station 3
Birthweight and Weaning Weight Scenario

Joe is looking for a bull to breed his young heifers and small cows. He does not want his cattle to give birth to large calves (anything over 90 lbs.) because a large birthweight may cause serious problems for the cow and calf.

Joe plans to sell his calves in the fall after he has weaned them from their mothers. Typically, his calves weigh between 600-700 lbs. at weaning. He is paid for his calves by the pound, so he strives to raise calves with a high weaning weight.

Which bull would best fit Joe's needs?

1

BW: 80 lbs.
WW: 790 lbs.

2

BW: 77 lbs.
WW: 700 lbs.

3

BW: 105 lbs.
WW: 810 lbs.

4

BW: 70 lbs.
WW: 650 lbs.

Station 4
Polled and Horned Cattle

1 Read the background information on selective breeding and polled and horned cattle.

2 Study the polled and horned cattle scenario. How can selective breeding benefit this beef producer?

3 Analyze each of the cows and determine which **genotype** will produce offspring with no horns.

Station 4
Polled and Horned Cattle
Background Information

Many beef producers like to select and breed cattle that are naturally **polled**. Polled means the cattle will not grow horns.

The polled gene is a desirable trait for safety and management reasons. If cattle are naturally polled, cattle producers don't have to worry about injuries from horns, and they won't have to spend time de-horning cattle.

Station 4
Polled and Horned Cattle Scenario

The polled gene in cattle is dominant (P) to the horned gene (p).

Brad, a local beef producer, currently has a horned Hereford bull (pp) that he uses to breed his cows; however, he doesn't want any of his calves to have horns. Which cows should he select to ensure **no** offspring will have horns?
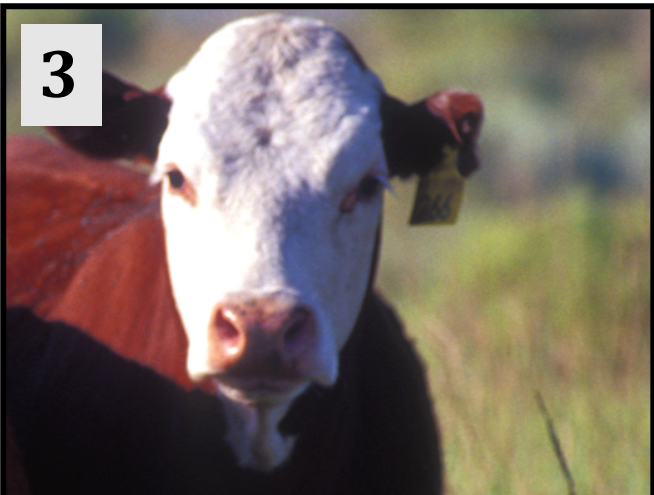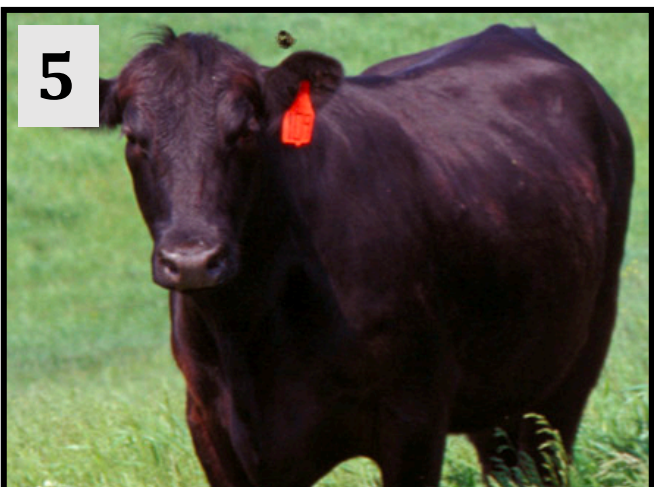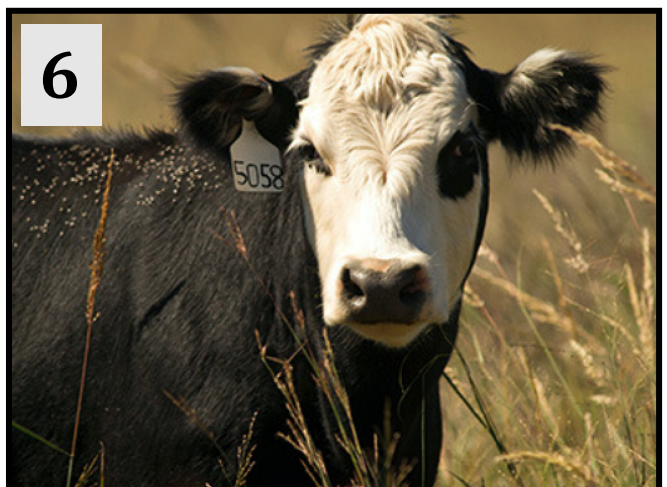

	?	?
p		
p		

1

Genotype: (pp)

2

Genotype: (Pp)

3

Genotype: (PP)

4

Genotype: (PP)

5

Genotype: (PP)

6

Genotype: (Pp)