



Dairy Worksheet

Objective(s):

Students will be able to use scientific genetics to realize how genotypes and phenotypes relate to the agriculture industry.

Indiana Academic Standards:

7.LS.1: Investigate and observe cells in living organisms and collect evidence showing that living things are made of cells. Identify the characteristics of living things.

National Agricultural Literacy Outcomes

Science, Technology, Engineering & Mathematics Outcomes

T4.6-8.b. Describe how biological processes influence and are leveraged in agricultural production and processing.

Materials:

Writing utensil

Student worksheet

DAIRY

Background Information: Most Holstein dairy cattle are black and white. Black spots are the dominant gene (RR), meaning most dairy cattle will have black spots (RR or Rr). The red and white Holstein carries a recessive (rr) gene, and is not very common.

Directions: Today, you are going to be a genetic scientist! Use these Punnett squares to determine the chances of getting a black and white or a red and white Holstein dairy cow.



Dominant



Recessive

	R	R
R		
R		

Percentage of a red and white calf: _____

Percentage of a black and white calf: _____

	R	r
r		
r		

Percentage of a red and white calf: _____

Percentage of a black and white calf: _____

	R	r
R		
r		

Percentage of a red and white calf: _____

Percentage of a black and white calf: _____

	R	R
R		
r		

Percentage of a red and white calf: _____

Percentage of a black and white calf: _____

	r	r
r		
r		

Percentage of a red and white calf: _____

Percentage of a black and white calf: _____



Teacher Answer Key

	R	R
R	RR	RR
R	RR	RR

Percentage of a red and white calf:

0%

Percentage of a black and white calf:

100%

	R	r
r	Rr	rr
r	Rr	rr

Percentage of a red and white calf:

50%

Percentage of a black and white calf:

50%

	R	r
R	RR	Rr
r	Rr	rr

Percentage of a red and white calf:

25%

Percentage of a black and white calf:

75%

	R	R
R	RR	RR
r	Rr	Rr

Percentage of a red and white calf:

0%

Percentage of a black and white calf:

100%

	r	r
r	rr	rr
r	rr	rr

Percentage of a red and white calf:

100%

Percentage of a black and white calf:

0%

Supplemental Information

- Indiana has over 800 dairy farms of all shapes and sizes.
- Holsteins represent 70% of the dairy cows in Indiana.
- 97% of Indiana dairy farms are family owned.
- Indiana has over 174,000 dairy cows.
- One dairy cow can produce close to 7 gallons of milk each day or about 400 glasses of milk.
- The dairy industry has an economic impact of nearly \$629 billion each year.
- **Careers:** Milk inspector, milk nutrition scientist, dairy cattle herd manager and cattle caretaker