

Investigation 2: Incomplete dominance

Feathering in chickens, the ability for the feathers to lay down or curl outward, is an incompletely dominant gene. Feathers that lay down help a chicken to stay warm and maintain their body temperature in cold weather. This is known as smooth feathering (ff). Feathers that curl outward allow the chicken's body heat to escape into the environment and is known as frizzle feathering (Ff). If a chicken possesses two of these curling alleles, it will not be able to maintain its body temperature and will die shortly after hatching. This combination is known as frazzled feathering (FF).

The curling trait has become popular with chicken enthusiasts and makes the chicken look unusual, to say the least! Take a look at the Smooth chicken versus the Frizzle chicken below and discuss how this trait is both helpful and harmful to birds.



Smooth feathers (ff)



Frizzled feathers (Ff)

1. Identify the phenotype for each genotype listed, then complete the Punnett squares and answer the following questions.

Genotype	Phenotype
FF	
Ff	
ff	

A frizzle rooster is crossed with a hen that is frazzled.

How many offspring are...

- Smooth: _____
- Frizzled: _____
- Frazzled: _____

2. Two frizzle chickens are crossed.

How many offspring are...

- Smooth: _____
- Frizzled: _____
- Frazzled: _____

3. A Frizzle rooster is crossed with a hen that has normal feathers.

How many offspring are...

- Smooth: _____
- Frizzled: _____
- Frazzled: _____

4. A Frazzled rooster is crossed with a hen that has normal feathers.

How many offspring are...

- Smooth: _____
- Frizzled: _____
- Frazzled: _____

5. Poultry breeders need to be careful when breeding chickens for this trait. Look at your data in the Punnett squares above and explain what would be the best method to breed frizzle chickens for consumers.

6. Explain why commercial breeders would not want this trait amongst their flock.
7. This trait is very rare in wild poultry even though it is dominant to smooth feathers. Why don't you see more frizzled bird species in the wild?