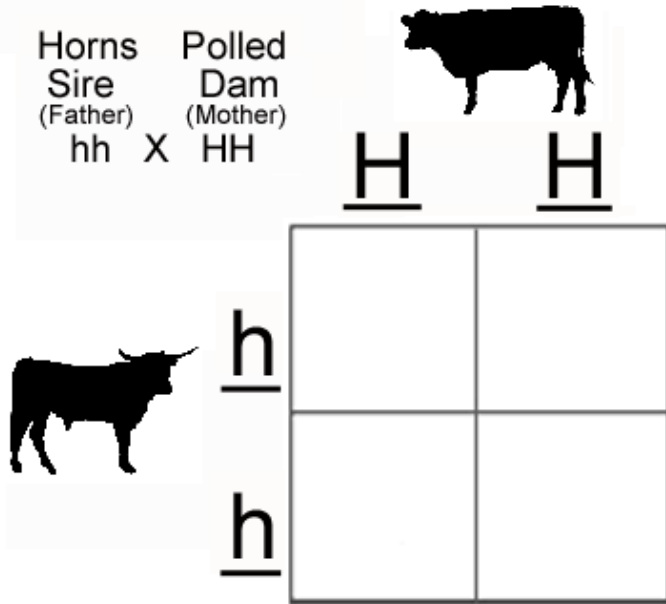


Bos Taurus Genetics

Many ranchers use longhorn bulls on their beef herds because the longhorn produces a much smaller calf. However Longhorns have horns and most beef cattle do not. Ranchers prefer not to have horns on their cattle. Fill out the Punnett Squares to show the results of possible crosses. List the possible resulting genotypes and phenotypes and their likely percentages.

1. Homozygous Cross



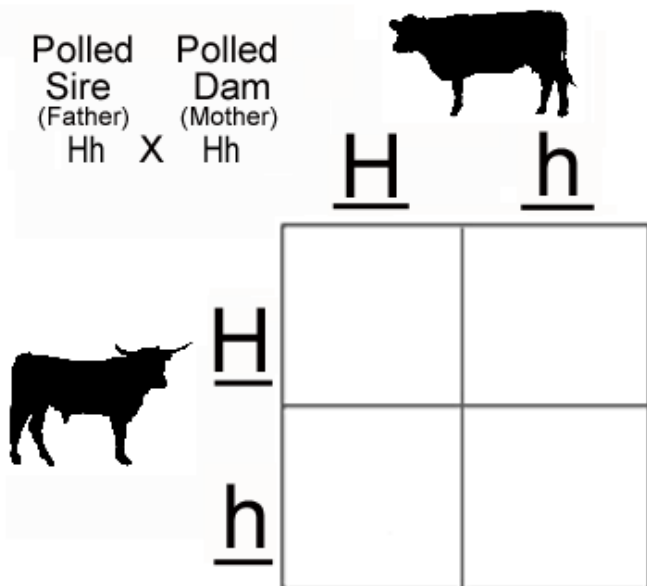
Phenotypes :

_____ %HH
 _____ %Hh
 _____ %hh

Genotypes:

_____ % Horns
 _____ % Polled

2. Heterozygous Cross



Phenotypes :

_____ %HH
 _____ %Hh
 _____ %hh

Genotypes:

_____ % Horns
 _____ % Polled

3. Homozygous / Heterozygous Cross

Polled Sire (Father) Hh X Polled Dam (Mother) HH

Phenotypes :

_____ %HH

_____ %Hh

_____ %hh

Genotypes:

_____ % Horns

_____ % Polled

4. Based on what you just learned about horn genetics which two statements are true about the calf on slide 11 ?

- A. Both of this calf's parents had horns
- B. This calf's sire and dam both carry the recessive allele for horns.
- C. The genotype represented by this calf is hh.
- D. The genotype represented by this calf is either Hh or HH.

5. Three alleles make the base color genetics more complex list all possible phenotypes under their genotypes. Possible Allele Combinations: $E_D E_D$, $E^+ E^+$, $e e$, $E_D E^+$, $E_D e$, $E^+ e$

Black	Wild Type Brown or Gray	Red
_____	_____	_____
_____	_____	

6. Fill out the Punnett Squares for all possible homozygous color crosses.

$E^+ E^+ \times ee$

	—	—
—		
—		

Phenotypes : _____

Genotypes: _____

$E_D E_D \times ee$

	—	—
—		
—		

Phenotypes : _____

Genotypes: _____

7. Fill out the Punnett Squares for two allele heterozygous color crosses.

$E_D E_D \times E_D e$

	—	—
—		
—		

Phenotypes :

_____ % $E_D E_D$

_____ % $E_D e$

_____ % ee

Genotypes:

_____ % Black

_____ % Red

$E_D E^+ \times E_D E^+$

	—	—
—		
—		

Phenotypes :

_____ % $E_D E_D$

_____ % $E_D E^+$

_____ % $E^+ E^+$

Genotypes:

_____ % Black

_____ % Wild Type

8. Which statement is true about the cow and calf shown on slide 18.
- A. The cow and calf are both homozygous.
 - B. The calf inherited her color genes from her sire.
 - C. The cow is heterozygous and the calf inherited her recessive gene for her base color.
 - D. This cow cannot be this calf's dam.

9. Now try crosses with three alleles.

$E_D E_D \times E^+ e$

	—	—
—		
—		

Phenotypes :

_____ % $E_D E^+$

_____ % $E_D e$

Genotypes:

_____ % _____

$E_D e \times E^+ e$

	—	—
—		
—		

Phenotypes :

_____ % $E_D E^+$

_____ % $E_D e$

_____ % $E^+ e$

_____ % $e e$

Genotypes:

_____ % Black

_____ % Wild Type

_____ % Red