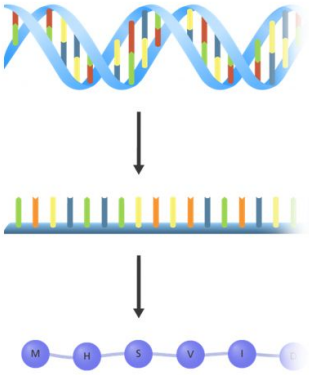
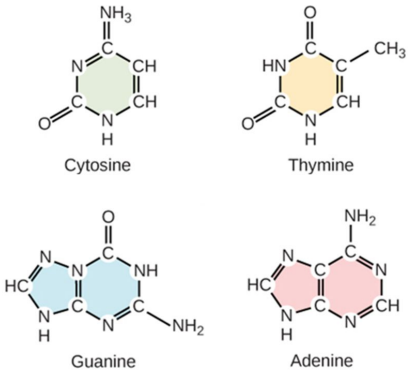
A



Central Dogma

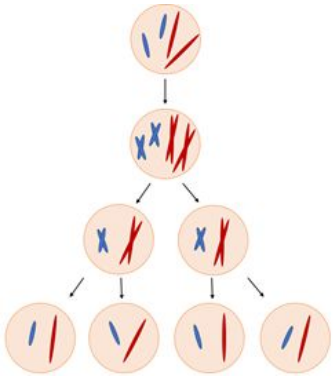
A

2



2

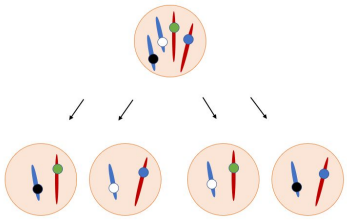
3



Mendel's Law of Segregation

3

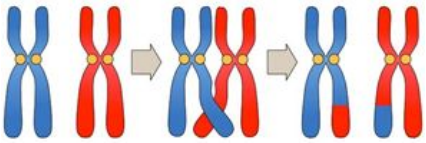
4



Mendel's Law of Independent Assortment

4

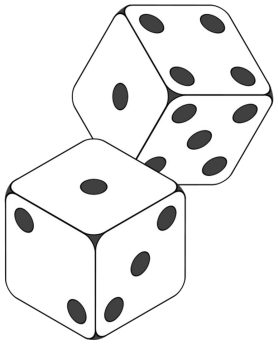
5



Recombination

5

6

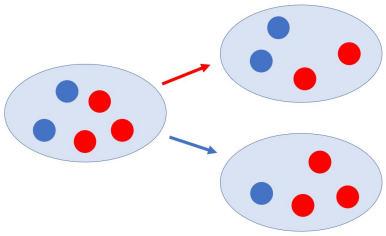


$P(1 \cap 4) = P(1) \times P(4)$

Independent Events

9

7

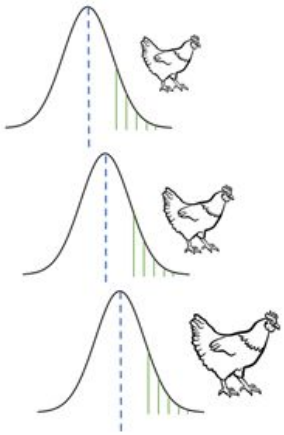


$P(\text{red} \cap \text{blue}) = P(\text{red}) \times P(\text{blue}|\text{red})$

Dependent Events

7

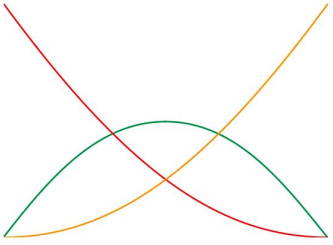
8



Genetic Selection

8

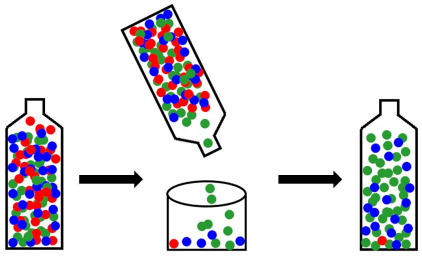
9



Hardy-Weinberg Equilibrium

6

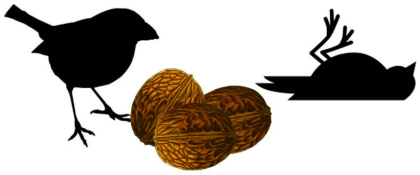
10



Genetic Drift

10

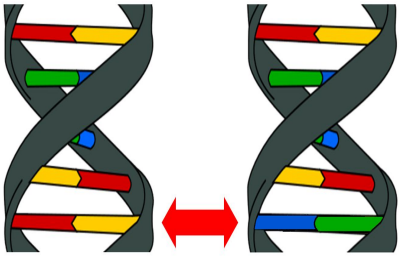
J



Genetic Fitness

J

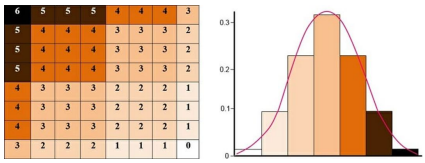
Q



SNP

Q

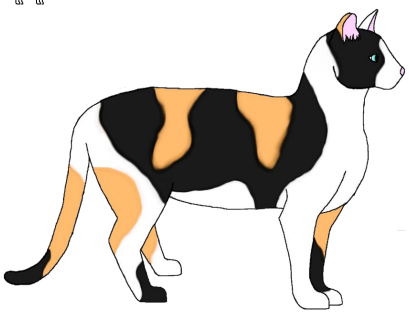
K



Additive
Genetics

K

A



Sex-Linked
Genetics

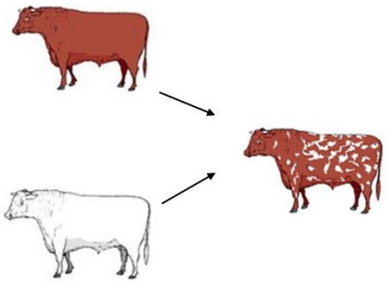
A

2

Epigenetics

2

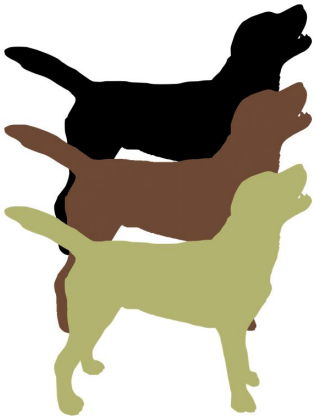
3



Codominance

3

4



Epistasis

4

5

Phenotypic
Plasticity

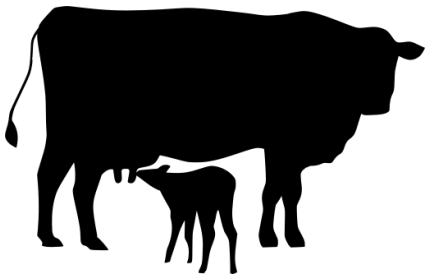
5

6

Environmental Effects

9

7



Permanent Environmental Effects

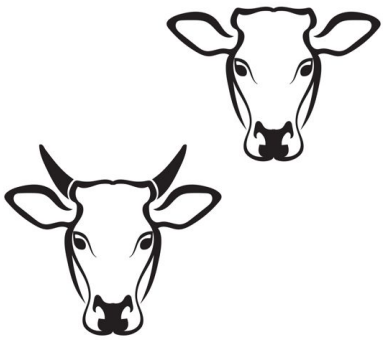
7

8

Temporary Environmental Effects

8

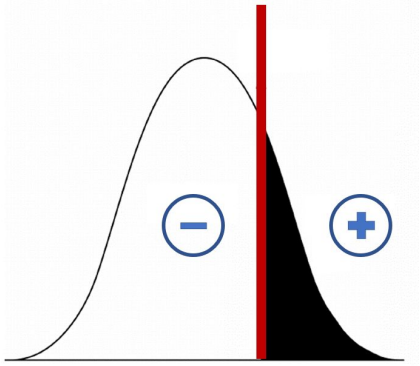
9



Categorical Trait

9

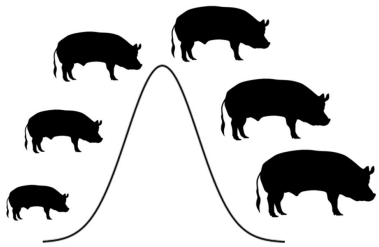
10



Threshold Trait

10

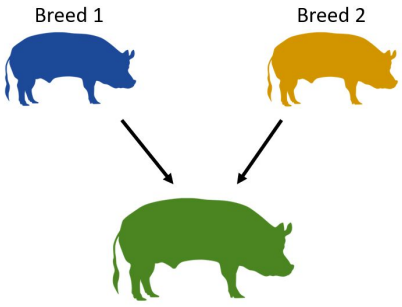
J



Continuous Trait

J

Q



Heterosis

Q

K

$$P = G + E$$

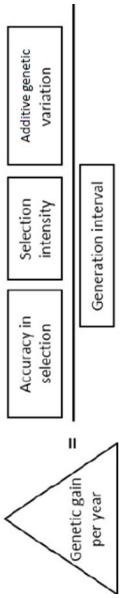
K

A

$$G = BV + D + I$$

A

2



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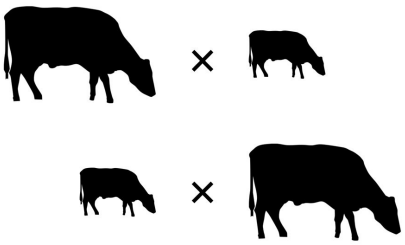
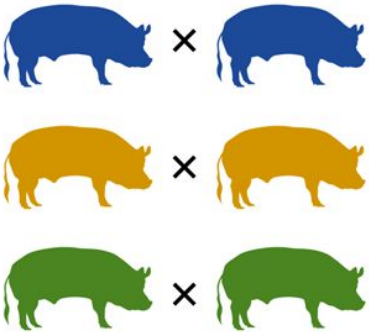
3



Negative
Assortative Mating

3

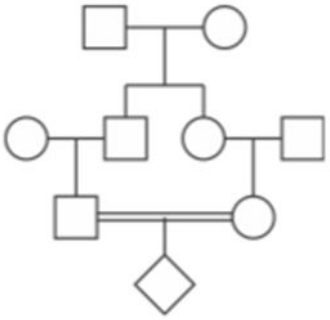
4



Positive
Assortative Mating

4

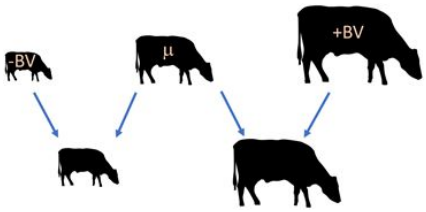
5



Inbreeding

5

6



Breeding Value

6

7

$$h^2 = \frac{\sigma^2_{BV}}{\sigma^2_P}$$

Narrow-Sense
Heritability

7

8

$$H^2 = \frac{\sigma^2_G}{\sigma^2_P}$$

Broad-Sense
Heritability

8

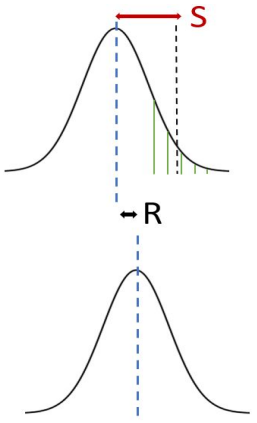
9

$$r = \frac{\sigma^2_G + \sigma^2_{PE}}{\sigma^2_P}$$

Repeatability

6

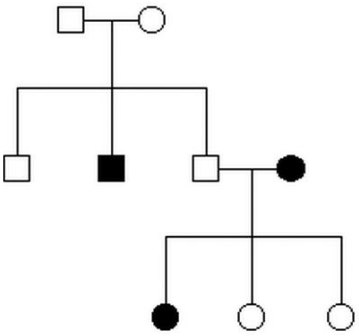
10



Breeder's Equation

10

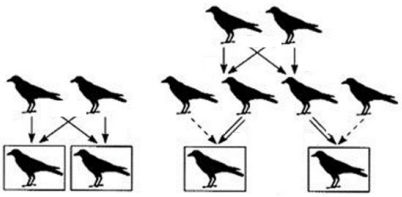
J



Pedigree

J

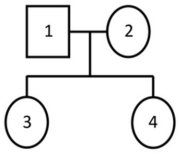
Q



Kinship Coefficient

Q

K

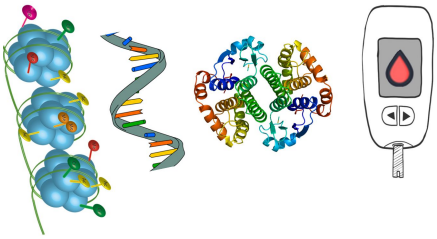


	1	2	3	4
1	1	0	0.5	0.5
2	0	1	0.5	0.5
3	0.5	0.5	1	0.5
4	0.5	0.5	0.5	1

Relationship Matrix

K

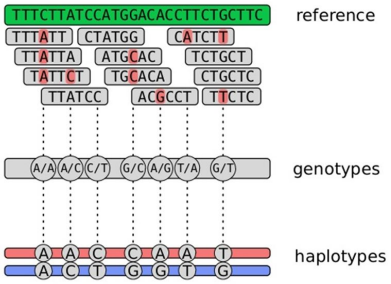
A



Multi-Omics

A

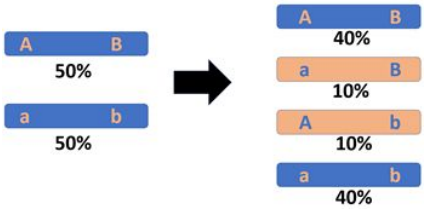
2



Haplotype Phasing

2

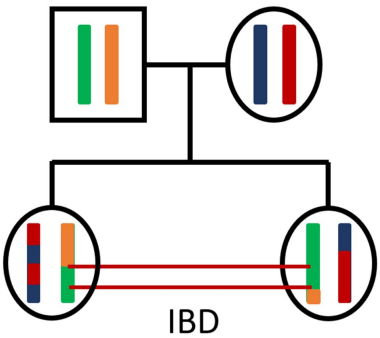
3



Linkage Disequilibrium

3

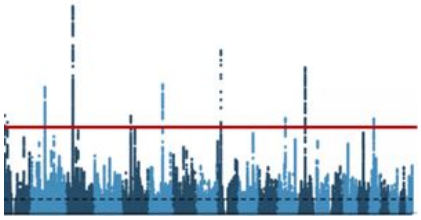
4



Identical-By-Descent

4

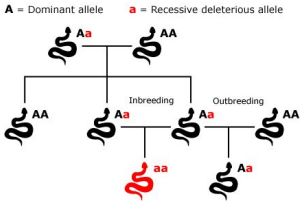
5



Genome-Wide Association Study

5

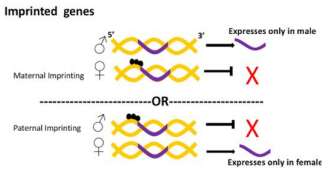
6



Inbreeding Depression

6

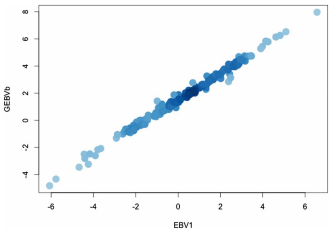
7



Genomic Imprinting

7

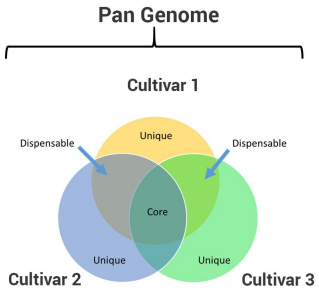
8



Genomic best linear unbiased prediction (GBLUP)

8

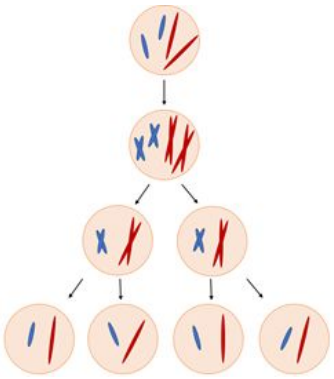
9



Pan-genome

9

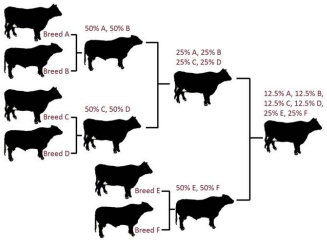
10



Mendel's Law of Segregation

10

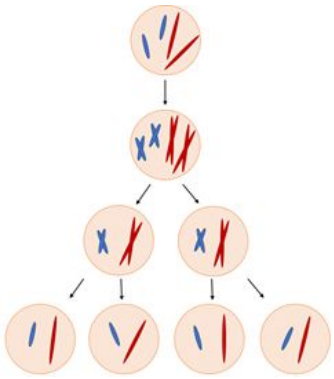
J



Rotational cross-breeding

J

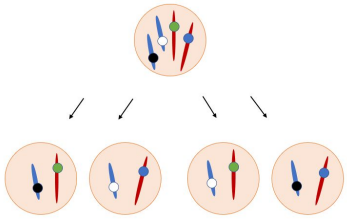
Q



Mendel's Law of Segregation

Q

K



Mendel's Law of Independent Assortment

K

JOKER

$$Y = Xb + Zu + e$$

Mixed Effects Model

JOKER

JOKER

$$\begin{bmatrix} X'X & X'Z \\ Z'X & Z'Z + \frac{\sigma_e^2}{\sigma_a^2} A^{-1} \end{bmatrix} \begin{bmatrix} b \\ u \end{bmatrix} = \begin{bmatrix} X'Y \\ Z'Y \end{bmatrix}$$

Mixed Model Equations

JOKER