Genetic Selection
Genetics

- Sheep = genetics + environment
• Single Loci Traits
  – Black Sheep vs Black Faces Sheep
  – Horned vs Polled
Genetics

- Multi loci Traits
  - Skeletal, Carcass and Wool
    - Highly Heritable
      - $H^2 = 0.3$ to $0.5$
Genetics

• Multi loci Traits
  – Growth, Production, Milk
    • Moderately Heritable
      – $H^2 = 0.25$
Genetics

• Multi loci Traits
  – Reproduction
    • Low Heritability
      – $H^2 = 0.1 - 0.15$
Selection

- Rams have the largest influence on flock genetics!
- Ewes = Profits
  - Maternal Rams
  - Terminal Rams
Selection

- Sources for Rams
  - Sale Barn
  - Show Ring
  - Neighbor
  - Pure-bred Breeder
  - Centralized Ram Test
Selection

• Source of Information
  – None
  – Visual
  – On Farm Test
  – Centralized Ram Test
  – Production Records
  – Genetic Estimates
Selection

• Records
  – Birth Type
  – Birth Weight
  – Weaning Weight
  – Yearling Weight
  – Rib-eye Area and Backfat
  – Wool Traits
    • Staple Length
    • Fiber Diameter
    • Fleece Weight
LAMB CROP

- Number of lambs born is the single trait most affected profitability
Bigger sheep have bigger lambs

1 lb increase Weaning wt = 2 ½ pound increase in ewe mature body size

NDSU NORTH DAKOTA STATE UNIVERSITY
Genetically, we went from dwarfs to giants in just 30 years.
World Sheep Breeds

- Breeds of Sheep
  - 235 breeds worldwide

- American Breeds
  - < 20 have commercial impact
Breeds of Sheep

• Types
  – Meat
  – Mother
  – Milk
  – Wool
  – Hair
Commercial Production

• Highly Recommend Crossbreeding
  – Improved lamb survival
  – Improved growth
  – Lower likelihood of genetic abnormalities
Genetic Progress?

- Outputs – Inputs = Productivity
- We can not accurately predict inputs.
  - Labor
  - Feed Costs
- Most efficient in your environment
- Most productive from similar environments