

Virginia 4-H Dairy Quiz Bowl Team Study Materials
 Section 7. Genetics

- The Animal Model uses pedigrees, progeny, and performance when making its evaluation.
- USDA publishes bull proofs four times per year in the following months:
 - February
 - May
 - August
 - November
- Bull stud codes
 - Genex/CRI 1
 - Select Sires 7 & 9
 - Alta Genetics 11
 - Accelerated Genetics 14
 - ABS Global, Inc. 29
- The sire determines the sex of a calf.
- No young bulls carrying BLAD have been admitted to AI sire proving programs since 1992.
- Dairy cattle have 30 pairs of chromosomes.
- Chromosomes are found in the nucleus of the cell.
- ABS Global, Inc. owns the rights to a molecular biological tool that detects the red factor gene in cattle.
- A registration paper or certificate accompanies a purebred animal and certifies its parentage.
- The maternal grandsire, maternal granddam, paternal grandsire, and paternal granddam each contribute 25% of an animal's genes.
- The first AI cooperative in the U.S. was organized in New Jersey in 1938.
- The first step in a herd improvement program is identification.
- Inbreeding can decrease mature equivalent (ME) milk production by 60 to 80 pounds per lactation.
- Consequences of inbreeding include:

| | |
|--------------------------------------|---|
| • Decreased general vigor | • Increasing similarity between animals |
| • Decreased production | • Mature size is smaller |
| • Decreased reproductive performance | • More recessive genes exposed |
| • Increased calf mortality | • Slower growth rate |
- A minimum of ten (10) daughters is required for a bull to have a sire proof published.
- The six traits that are used in an Udder Composite Score in Holsteins (weights are shown in parentheses):
 - Udder depth (30%)
 - Front teat placement (16%)
 - Udder cleft (10%)
 - Rear udder height (16%)
 - Rear udder width (12%)
 - Fore udder attachment (16%)
- Lifetime Net Merit, Cheese Merit, and Fluid Merit are genetic indexes that combine PTA's for eight (8) traits. The production traits are weighted differently in each index to reflect how milk is priced in different markets. The traits included are:

| | |
|----------------------|---------------------------|
| • Milk | • Productive Life |
| • Fat | • Feet and Legs Composite |
| • Protein | • Udder Composite |
| • Somatic Cell Score | • Body Size |
- The components of the Holstein Type Production Index (TPI) and the corresponding weights assigned to them are:
 - Production (4) → {Protein, Fat}
 - Type (2) → {PTA Type, Udder Composite, Feet and Legs Composite}
 - Health (1) → {Productive Life, Somatic Cell Score}
- The four traits used in the Feet and Leg Composite Score for Holsteins are:
 - Foot angle (24%)
 - Rear legs - rear view (18.5%)
 - Rear legs - side view (7.5%)
 - Feet and leg breakdown (50%)

Virginia 4-H Dairy Quiz Bowl Team Study Materials
 Section 7. Genetics

- Suffixes used to identify undesirable recessive traits
 - Ayrshire - none documented
 - Brown Swiss
 - Carriers as determined by identification of affected offspring
 - (W)..... Weaver
 - (S).....Spiderleg
 - (M)..... SMA
 - Confirmed animal through diagnosis by an approved laboratory
 - (CW)..... Weaver
 - (CS).....Spiderleg
 - (CM)..... SMA
 - Carrier determined by DNA testing, at a confidence level of 90% or above
 - (W*)..... Weaver
 - (S*).....Spiderleg
 - (M*)..... SMA
 - Non-carrier determined by DNA testing, at a confidence level of 90% or above
 - *TW..... Weaver
 - *TS.....Spiderleg
 - *TM..... SMA
 - Guernsey - none documented
 - Holstein
 - *BD..... Bulldog
 - *HL..... Hairless
 - *DF..... Dwarfism
 - *MF..... Mule-Foot (Syndactylism)
 - *IS..... Imperfect Skin
 - *PG..... Prolonged Gestation
 - *PT..... Pink Tooth (Porphyria)
 - *DP..... Deficiency of Uridine Monophosphate Synthase (DUMPS)
 - *TM..... Recessive Tested Mule-Foot
 - *TD..... Tested free of DUMPS
 - *RC..... Red Hair Color Carrier
 - Jersey
 - (LL)..... Limber Legs
 - (RVC)..... Retrovaginal Constriction
 - Milking Shorthorn - none documented
- The sampling code in a sire summary is a code used to identify a bull's original sampling circumstances. The codes are defined as follows:
 - S = standard sampling – This code indicates that a bull was sampled by distribution of semen to a minimum of 40 herds from which records qualify for USDA or Ag. Canada genetic evaluations and which are enrolled in the standard progeny test program of the AI business.
 - O = other sampling – All bulls which are enrolled in the Cross Reference Program but are not accurately described by the above definitions or are not assigned a sampling code by the time they are three years old are assigned this code.