

Larry V. Cundiff

Research Geneticist

US Market Animal Research Center, Clay Center, NE

Presentation at the Tulsa State Fairgrounds

9-28-2013

Research has indicated that breeds developed in harsher (more Northern) climates tend to have more marbling than those produced in warmer, milder climates. (Meat from Norwegian Reds, and Swedish Red & Whites exemplify these findings)

At the MARC station they have found that a breeder can expect to see a 23% increase in productivity due to heterosis (crossing two purebred lines)

- 14% of this increase comes in the form of maternal benefits (better reproductive traits, better milk, etc.)
- 9% comes from an increase in the growth and survival rates of crossbred calves

Hereford and Angus cattle are used as the benchmark for evaluating test data

The Cycle Program set out to evaluate F1 crossbred females through an 8 year lifespan

- A base herd of 2000 Angus females was utilized
- 25 bulls from each respective breed were used to cross with these females

Cycle V (1992-1994) introduced both Belgian Blue and Piedmontese sires for crossing

- Blues had a quick 283 day gestation (similar to the British breeds)
- Blue sired calves in the study were raised in 2 pens (20-25 hd/pen)
- 1990's British breeds were similar in growth to Continental breeds
- "Curve Bender" bulls in the Angus breed decreased BW and increased YW
- The Retail Product analyzed from the crossbred calves in this study consisted of all Steaks, Roasts, and Hamburger (mixed to 20% fat content) for each animal
- The Retail Product was trimmed to leave 3mm of fat on the carcass (Blue sired calves did not have 3mm of fat to begin with)
- All calves were on feed for 445 days (approx. 15 months)
- ½ carcass weights showed 488# for Angus, 517# for Piedmontese, and 541# for Blue sired calves
- Total weight of bones per carcass were similar across the board (nature maintains the same amount of bone to carry the animal no matter what the breeding is)
- Total trim weights 235# Angus, 156# Piedmontese, 169# Blues
- Myostatin is a recessive trait except for its effect on tenderness
- Steak Shear Force (lower numbers = better) 8.9 Angus, 9.4 Piedmontese, 10.0 Blue
- Tenderness Sensory Panel (higher numbers = better) 5.77 Angus, 5.49 Piedmontese, 5.30 Blue

- Sensory Panels did find that meat from Blue and Piedmontese sired calves contained less connective tissue
- Percent Retail Product increased 10% with the presence of 1 copy of the myostatin gene (mH allele), and 20% with the presence of 2 copies (it is important to genetically verify the sire has 2 copies of the mH allele to ensure 1 copy is passed on to all progeny)
- Researchers are still uncertain on what influences the transfer of the mH allele from parent to offspring
- The presence of the mH allele increased the tenderness of the round steak (typically a tougher cut of meat) in blue sired cattle to tenderness levels equal to the rib eyes from animals with no copies of the mH allele
- Feed Efficiency
 - o When harvesting at a designated Fat Thickness/Marbling Angus wins
 - o When harvesting at Time/Age endpoints Continental breeds win (advantage less prevalent)
 - o When harvesting for Weight endpoints Continental wins
- Growth is linear and feed intake increases at endpoints
- Live weight gain similar between Continental and British breeds
- Blues and Piedmontese show an extra 3% dressing percentage
- Blues and Piedmontese exhibit and Efficiency of Lean Growth
- Breeders must find a way to be compensated for this extra carcass and lean-tender beef

Cycle VI (1997-1998) introduced molecular DNA marking technology

Doctor Cundiff suggested the ideal breeding model for beef producers concerned with maximizing beef output would be the following

- Blues should be utilized as a terminal sire in the beef breed
- Breed composite cows at 5 years of age and older to Blue bulls to maximize beef
- Breed the cows which are younger than 5 to produce the herd's replacements