Dave Nichols
Bridgewater - Iowa

Nichols Farms
Superior Beef Genetics

Nichols Farms is a Full Service Genetic Provider with locations in five states. In '2012 Nichols Farms was the 4th largest seedstock operation in the USA.

Nichols Farms
Superior Beef Genetics

2188 Clay Avenue
Bridgewater, IA 50837

Select for rapid early growth

Cattle grow slowly: .2% to .6% of body wt. per day. Compared with broilers: 3% to 20% wt. per day.

Increasing relative rate of gain and harvesting at younger ages increases the efficiency of beef production.

Biological Efficiency and Relative Competitiveness of Beef, Pork, and Poultry Production; Vision for The Future, Iowa State University, 1992— Allen Trinkle Ph.D

Feed Efficiency — RADG EPD

RADG EPD allows producers to select Angus genetics that will perform more efficiently in a feedlot. It provides an EPD to identify cattle that, with a given quantity of feed, will still perform well. The individual intake data and genomic information on dry-matter intake in a genetic evaluation gives beef producers a valuable tool to select for more feed efficient genetics.

REAL WORLD $$$$$$

Cattle as received

Kind of cattle	Heifers
Date received	9/21/12
Number of head	43
Pay weight in	932

Cattle as shipped

Date of sale	12/30/12
Number of head	43
Pay weight 0ut	1479

Performance

Gain/Head/day	5.41
Cost lb. gain	$95.39

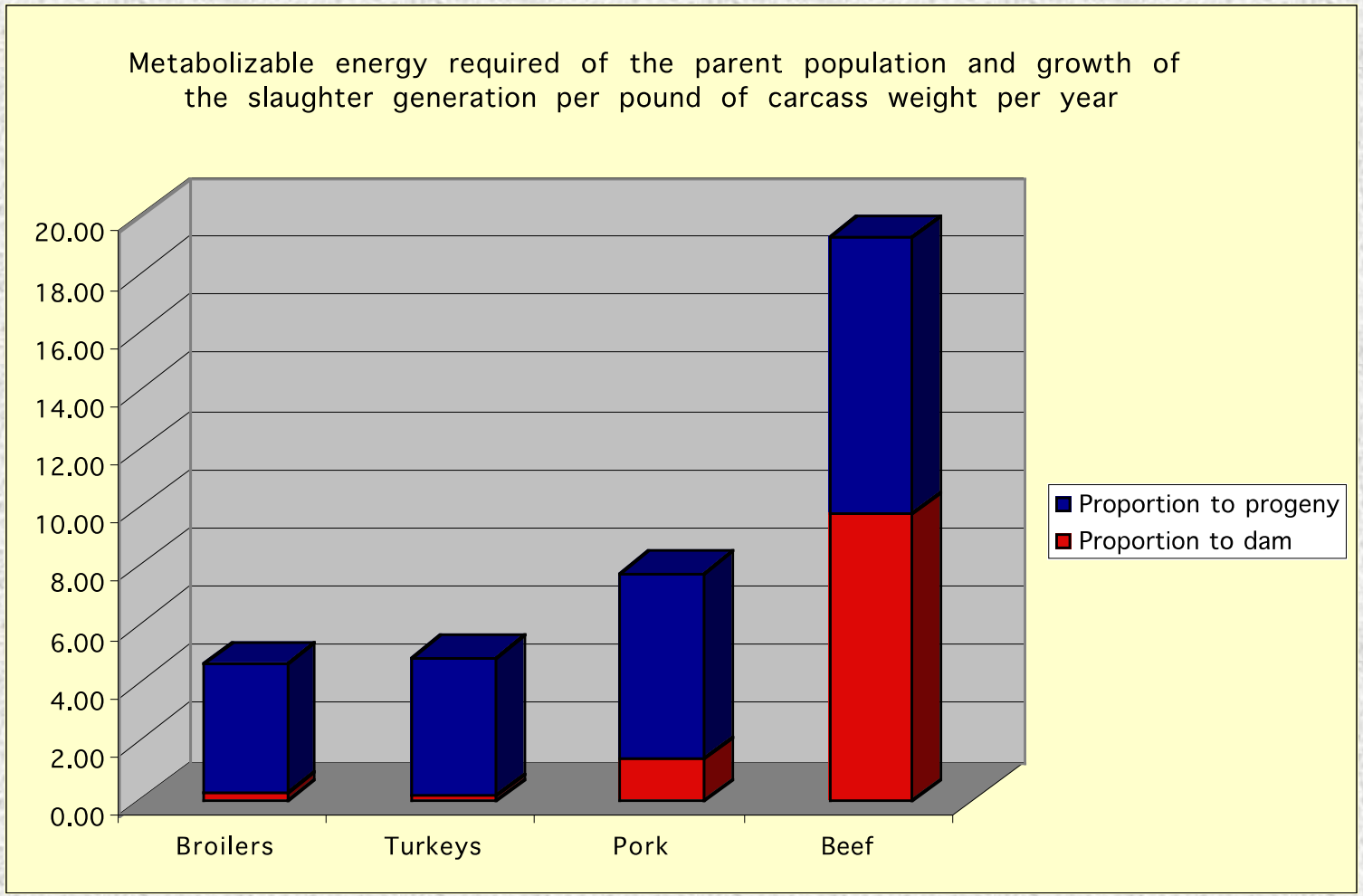
Feed Conversion

As Fed	5.54/lb of gain

Net Profit or Loss

Profit per head	$232.31

Reality Check...



Biological Efficiency and Relative Competitiveness of Beef, Pork, and Poultry Production; Vision for The Future, Iowa State University, 1992— Allen Trinkle Ph.D.

Utilize DNA intake profiles in the selection and systematic culling of seedstock

Improving the metabolic efficiency of beef cows and their calves before reaching the feedlot would have a dramatic impact on decreasing the price of beef, increasing profit for the producer and increasing per capita beef consumption.

Biological Efficiency and Relative Competitiveness of Beef, Pork, and Poultry Production; Vision for The Future, Iowa State University, 1992— Allen Trinkle Ph.D.

Absolute Necessity!

Those farms, ranches, seed stock breeders, and industries, who ignore their customers' real or perceived values, and lack the guts or the tools to control costs are doomed to the trash can of history —

Smart People Told Columbus the World Was Flat. He Didn't Insist It Was Round . He Got In the Boat!

Kansas City, March 2013

NBCEC Overview

Dorian Garrick

dorian@iastate.edu

www.nbcec.org

NBCEC Mission

- Develop and implement improved predictions so selection can enhance economic viability of US beef cattle producers

NBCEC Objectives

- Establish & co-ordinate priorities for prediction
- Consolidate research efforts
- Streamline the process between the development and adoption of new genetic evaluation methodologies
- Identify new traits & technologies
- Create decision-making tools

Genomic Prediction

- Within-breed genomic prediction
  - Requires a training population for every target breed
- Across-breed genomic prediction
  - Avoids a training population for target breed
- Genomic prediction using admixed data
  - Improve predictive ability in target population by pooling training data from target & other breeds

Research vs Servicing

- Routine generation of molecular breeding values (MBV)
  - Pipelines implemented at GeneSeek that allow MBV to be directly determined and delivered to Breed Association
- Trivial updating of prediction equations as often as warranted
- Allows NBCEC activities to focus on research to improve predictive ability

(Illumina) Genotyping Options

- Illumina 50k ($80) (soon to be terminated)
- Illumina 770k HD ($175)
- GeneSeek Genomic Profiler GGP-LD (10k) (now) $45
  - From hair, incl parentage, imputation, MBV, free content
- GGP-HD (taurus) (available now) $75
- GGP-HD (indicus) (by mid 2013) $75
- GGP-super LD (20k) (by mid 2013)

- Exome & Whole Genome Next Generation Sequencing

Imputation Pipeline

- Technique for in silico creation of higher density genotypes from animals with lower density genotypes
  - Requires a training population of animals genotyped at higher density
- Pipeline established at GeneSeek

Blending Methods

- Blending is the method of combining genomic information with information from non genotyped relatives
- Four methods
  - MBV as correlated trait (AAA)
  - MBV as an external EPD (ASA)
  - Post NCE selection index (AHA)
  - Pooled genomic and pedigree relationships (Dairy)
- Working on a new approach!

Major Extension Efforts
supporting all these NBCEC activities

University of Kentucky

UC Davis

Kansas State

University of Nebraska - Lincoln