

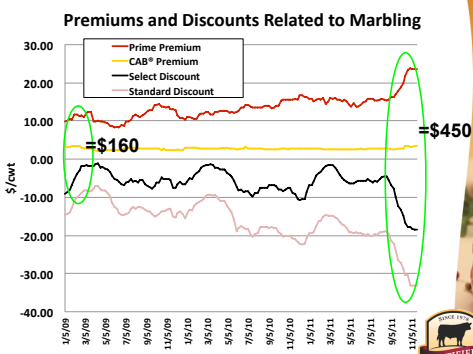
Genetic Tools to Meet Today's Beef Demand

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Outline

- Demand signals for beef producers
- Antagonisms with production?
- Genetic tools for selection
- Results of using the tools



Source: USDA LM_CT 169

Good News - Marbling is highly heritable!



But – What do I have to give up to get it?



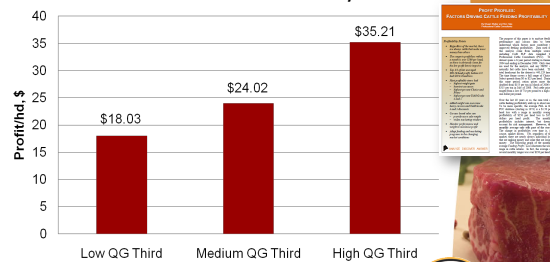
More Good News

Genetic Correlation to Marbling*	
Cow weight ¹	-0.15
Cow height ¹	-0.17
Body condition score ¹	-0.03
Calving Rate ²	-0.05
Calving Difficulty ²	-0.09
Weaning Weight ²	+0.21
Milk ³	+0.22
Scrotal Circumference ³	-0.04

* -1 = strong negative, 0 = none, +1 strong positive
¹ Neogawa et al., 2004, IMARC
² Splan et al., 1998, UNL
³ AAA Sire Summary, Spring 2011 – correlations are to Marbling EPD



Relationship between Quality Grade and Feedlot Profitability



Sources: Data collected from PCC and CAB cooperating feedlots on 443,128 steers in 2004-2009 and analyzed on a lot basis.



"The only aspect of a cattle operation that we as producers have total control over is genetics"

Mike Kasten, MO



The Evolution of Livestock Measurement

AVERAGE DAILY GAIN

ADJ WW	WWR	ADJ YW	YWR	64-DAY ADG	GR
672	110	1422	111	5.4	123

ADJUSTED WTS and WITHIN HERD RATIOS



EXPECTED PROGENY DIFFERENCES

BW	WW	YW
+1.3	.34	+54
RE	MRB	RE
+1.03	.25	

\$ VALUES: BIO-ECONOMIC INDEXES

\$Weaning	+31.87
\$Feedlot	+47.72
\$Grid	+38.26
\$QG	+28.41
\$YG	+9.85
\$Beef	+67.61



GENOMIC ENHANCED EPDs and INDEXES

EPDs

Individual | Pedigree | Progeny

Production											Marbling										
CS	SW	YS	FAC	FC	DC	IF	DCI	AB	MRB	RE	MR	MRB	RE	MR	MRB	RE	MR	MRB	RE	MR	
151	1.4	1.48	1.93	1.12	1.1	11.27	1.2	14.7	1.27	1.22	1.21	1.22	1.21	1.22	1.21	1.22	1.21	1.22	1.21	1.22	

Genomic Result

What data should I use in selecting a bull?

Animal & Carcass Measures, Pedigree, Ultrasound & DNA

GE EPDs

Interim vs. Genomic-Enhanced EPDs

Pedigree estimated EPDs, no ultrasound scan data

OLD	CWT	MARB	RE	FAT
EPD	I +15	I +.79	I +.41	I -.001
Acc	.05	.05	.05	.05

Genomics added

NEW	CWT	MARB	RE	FAT
EPD	+ 18	+ .71	+ .50	+ .004
Acc	.30	.38	.35	.28

Comparing Breeds

Breed	Adjustment Factor: Add to EPD to estimate across-breed Marbling EPD
Angus	0.00
Hereford	-0.32
Red Angus	0.00
Charolais	-0.40
Gelbvieh	---
Limousin	-0.69
Simmental	-0.51

USMARC, 2011

COW-CALF GUIDE
2012 EDITION

Best Practices Manual

Genetic Recommendations

Characteristic	EPD	Percentile	EPD Value*
Marbling	Marb	Top 40%	+0.42 or higher
Ribeye	RE	Top 50%	+0.22 or higher
Backfat	Fat	Mid 80%	+0.04 to -0.023
Carcass Index	\$ Grid (\$G)	Top 50%	+\$22.53 or higher

Angus or English-based Cowherd

	EPD	Percentile	EPD Value*
Marbling	Marb	Top 40%	+0.42
Ribeye	RE	Top 50%	+0.22 or higher
Backfat	Fat	Mid 80%	+0.040 to -0.023
Carcass Index	\$ Grid (\$G)	Top 50%	+\$22.53 or higher

**Based on percentiles from the Fall 2011 Angus Sire Summary - Current Sires*

Continental/Crossbred Cowherd (Medium Framed)

	EPD	Percentile	EPD Value*
Marbling	Marb	Top 25%	+0.52
Ribeye	RE	Top 50%	+0.22 or higher
Backfat	Fat	Mid 80%	+0.040 to -0.023
Carcass Index	\$ Grid (\$G)	Top 35%	+\$26.61 or higher

**Based on percentiles from the Fall 2011 Angus Sire Summary - Current Sires*

Continental/Crossbred Cowherd (Large Framed)

	EPD	Percentile	EPD Value*
Marbling	Marb	Top 25%	+0.52
Ribeye	RE	Mid 80%	-0.09 to +0.55
Backfat	Fat	No recommendation	
Carcass Index	\$ Grid (\$G)	Top 35%	+\$26.61 or higher

**Based on percentiles from the Fall 2011 Angus Sire Summary - Current Sires*

Sire Comparison: Marbling EPD

A	Carcass					
	CW Acc	Marb Acc	RE Acc	Fat Acc	Carc Grp/Pg	Usnd Grp/Pg
	+12	+0.71	+0.15	-0.15	153	3922
	.90	.91	.89	.89	761	9169

B	Carcass					
	CW Acc	Marb Acc	RE Acc	Fat Acc	Carc Grp/Pg	Usnd Grp/Pg
	+17	+0.12	+0.06	+0.43	257	3709
	.92	.93	.92	.92	1098	7887

Marbling EPD (Marb)	
Bull A	+0.71
Bull B	+0.12
Difference	.59

Expected marbling score difference in future progeny

The EPD Differences Are Important

2/3 of a Marbling Score
Expected Progeny Difference For Two Bulls

New Tool to Target Carcass Premiums



GENEMAX™ Overview

- Angus-specific DNA test for Marbling and Growth
- Designed for commercial cattlemen using registered Angus bulls
- Purpose:
 - Selection and marketing tool for replacement heifers
 - Decision and marketing tool for feeder cattle
 - At ranch
 - At feedlot
- Available early 2012



GENEMAX™ How it works

- Test kits ordered through AGI (AAA Login)
 - Cost \$15-20/test
- Samples returned to AGI and sent to PAG for genotyping
- AGI provides test results to customer



GENEMAX™ Applications

- Test replacement heifer candidates for in-herd selection
- Value-added feature for selling commercial heifers
- Testing of feeder calves (all or partial) for marketing decision tool, carcass merit feedback, and/or value-added marketing feature
- Management tool at feedlot



Results of Using Existing Genetic Tools



No. of Head	ADG	DM Conv.	Prime	CAB®	BCPR	Select
151	3.56	5.30	23%	58%	10%	0%
Steers: Average carcass premium per head = \$115.24						
74	3.48	5.40	15%	55.4%	28%	1.4%
Heifers: Average carcass premium per head = \$101.59						

Applied Reproductive Strategies Conference, 2010



Generations of Marbling Focused Genetics	USDA Prime
One	11% More likely
Two	19% More likely
Three	23% More likely

Robertson and Parcell, 2005



Trait	AI-sired X AI-sired cows (3 generations)	Average of Feedlot	Improvement
ADG, lb/day	3.8	3.3	15.2%
DM Conv, lb	5.4	5.8	7.4%
Choice, %	97	75	29.3%
CAB®, %	56	24	133.3%

Source: CAB® Licensed Feedlot



Thank You!

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