Beef Improvement Federation

Producer Applications

Genetic Selection Tools

July 2008

ANGUS
THE BUSINESS BREED

Angus Herd Improvement Records

1958-2008

BREED IMPROVEMENT
Angus Herd Improvement Records
BUILDS BETTER BEEF

The data has become currency of today

Richard L. Spader
2000 BIF Convention

...Decision Making Tools...

AMERICAN ANGUS ASSOCIATION
Sire Evaluation Report

Production						Maternal					
CED Acc	BW Acc	WW Acc	YW Acc	YH Acc	SC Acc	CEM Acc	Milk Acc	MkH MkD	MW Acc	MH Acc	$EN
+3 .88	+5.7 .97	+31 .97	+58 .96	+.5 .89	+1.96 .88	+6 .91	+27 .96	1252 3394	+25 .89	+.2 .89	+4.68

Carcass					Ultrasound				
Cwt Acc	Mrb Acc	RE Acc	Fat Acc	Grp Prog	%IMF Acc	RE Acc	Fat Acc		Grp Prog
+10 .71	+.14 .73	+.30 .69	+.008 .67	19 197	-.16 .88	+.57 .88	-.019 .88		288 491

$Values					
$W	$F	$G	$QG	$YG	$B
+15.95	+5.65	+14.85	+4.64	+10.22	+24.06

AAA Genetic Trend for Birth (BW), Yearling (YW) and Mature (MW) Weight EPDs

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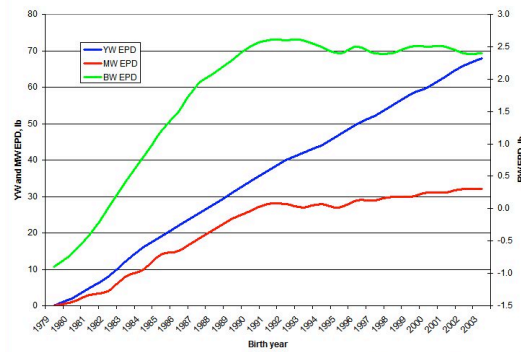
Genetic Evaluation Models: End Product

- **BIF Genetic Prediction Committee**
- **BIF Board of Directors**

  BIF Guidelines revision passed June 9, 2007

  - **Jointly analyze carcass and ultrasound data and report in a carcass EPD format**
  - **Carcass weight, marbling, rib, and fat EPDs**
  - **Use an age-constant endpoint**

**Genetic Evaluation Models: End Product**

American Angus Association Board of Directors
  - **June 2007 meeting**
  - **Approved to pursue combining the ultrasound and carcass AHIR® data to compute one set of carcass EPDs.**

  - **November 10, 2007**
  - **Approved the release of new carcass EPDs with the Fall 2008 National Cattle Evaluation.**

Why New Carcass EPDs?

- Simplify selection tools for commercial bull buyers using Angus genetics.
- Consolidate predictions for animals with carcass and/or ultrasound data.
- Focus on the economically relevant traits affecting quality and yield grade.
- Enhance the genetic evaluation through improved prediction models.
- Provide a platform for implementing future technologies for genetic improvement.
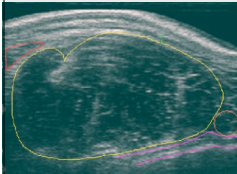
Carcass Evaluation
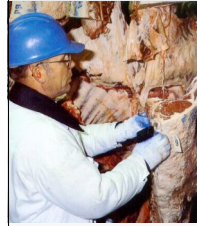
Spring 2008

- Initiated 1974
- 87,976 progeny records
  Includes ultrasound steers
- 6,638 sires

- Sire/maternal grandsire model
- 1979 base year
- Pedigree-estimated Interims

Ultrasound Evaluation

Spring 2008

- Initiated 1998
- 811,909 Records
- 63,326 Sires

- Animal model
- 1997 base year
- Interims may include individual performance deviation

Relationships

- Carcass traits
  - Value and economic relevance
  - Observed on fed steers and heifers
- Ultrasound traits
  - Indicator traits
  - Observed in yearling bulls/heifers
- Goal is to have genetic predictors for carcass traits.

Example: New Marbling EPD

Marbling scores
(steers and heifers)
Ultrasound %IMF
(bulls, heifers, and steers)

→ Animal Model →

Marbling EPD

- Units of carcass marbling score
- %IMF data is an indicator of carcass marbling.
- EPDs and ACC are not directly comparable to Fall 2007 published EPDs for carcass and ultrasound.

New Carcass Genetic Evaluation

Carcass					Ultrasound			
Cwt Acc	Mrb Acc	RE Acc	Fat Acc	Grp Prog	%IMF Acc	RE Acc	Fat Acc	Grp Prog

↓

Cwt Acc	Mrb Acc	RE Acc	Fat Acc

Release Date

Fall 2008 National Cattle Evaluation

Production						Maternal					
CED Acc	BW Acc	WW Acc	YW Acc	YH Acc	SC Acc	CEM Acc	Milk Acc	MkH MkD	MW Acc	MH Acc	$EN
+6 .90	+5.4 .97	+35 .97	+68 .97	+.8 .94	-.20 .92	+5 .92	+9 .97	2132 5754	+63 .91	+.9 .91	+11.04

Carcass					
Cwt Acc	Mrb Acc	RE Acc	Fat Acc	Carc Grp Carc Prog	Usnd Grp Usnd Prog
+19 .81	+.44 .83	+.48 .80	+.031 .79	110 472	148 214

$Values					
$W	$F	$G	$QG	$YG	$B
+5.18	+13.81	+28.07	+21.25	+6.82	+47.37

Docility EPDs

American Angus Association

1957-58 "Investment"
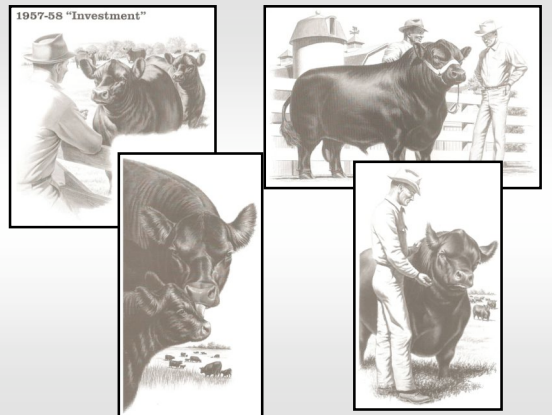
Industry Economics of Temperament

BLACKink BASICS™
VOLUME 1 • ISSUE 3

NERVOUS CATTLE WRECK PROFIT POTENTIAL

The Bottom Line

The relationship between disposition and postweaning calf value illustrates the economics of attitude. Calm cattle reduce injuries and facility damage, stay healthier, perform better on feed and earn higher grid premiums. Their more aggressive pen mates are leaner, but producers pay for higher death loss, carcass quality discounts and higher feed-to-gain ratios. Temperament is affected by human contact, handling technique and facilities, and subject to rapid improvement by genetic selection.

Wild cattle risk safety, health, facilities, feedlot profits, carcass value and consumer demand. Direct losses add up to $62.19 per head.

Effect of disposition on the difference in net dollars returned on a per head basis

	Disposition Score		
	Docile	Restless	Nervous to Aggressive
Quality Grade premium	$18.73	$12.29	PAR
Yield Grade premium	PAR	$0.87	$3.50
Light/heavy carcass weight discount	-$0.16	PAR	-$1.29
Dark cutter/hardbone discount	PAR	-$0.19	-$0.72
ADG Bonus*	$57.80	$28.91	PAR
Death loss discount**	-$0.90	PAR	-8.75
Treatment Cost***	-$0.54	-$0.08	PAR
Net Dollars Returned	$54.95	$41.80	-$7.26
$ Difference	$62.19	$49.06	PAR

*Based on pounds of additional carcass weight gained during the feeding period.
**Accounts for cost of gain investment and lost carcass value.
***Includes medicine, labor and chute/equipment charges.

Summary Facts

Docile cattle compared to aggressive pen mates

- Earned $62.19 per head more on a grid
  - $18.73 more Quality Grade premiums
  - Double the percentage of Prime and Premium Choice
  - Half the percentage of Standards
- *Certified Angus Beef* ™ (CAB®) brand acceptance 29.1%
  - More than double the rate for CAB® eligible aggressive cattle

Aggressive cattle compared to docile pen mates

- Produce less desirable carcasses
  - Leaner, lighter, tougher²
  - 25 percent dark cutters²
- Always-attentive cattle are harder to identify for treatment

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Docility Evaluation

Distribution of Temperament Scores, %

Bar chart:
- 1: 65
- 2: 28
- 3: 6
- 4: 1
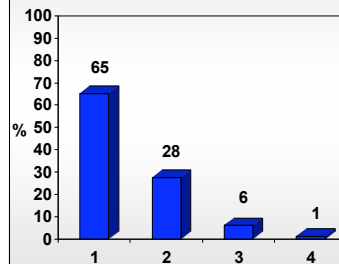
Yearling temperament:

34,869 edited records

6-point Scoring System

1 Docile

2 Restless

3 Nervous

4 Flighty (Wild)

4's

3

Docility Genetic Evaluation

- **Threshold analysis**
  Four categories: 1, 2, 3, 4 (scores 4-6)

- **Full animal model with four-generation pedigree**

Model:

- **Direct animal genetic effect**
- **Age of dam class**
- **Linear age (covariate)**
- **Residual error term**

Heritability
Docility   .37

Angus Docility

- **Research Docility EPDs**
- **Spring 2008 National Cattle Evaluation**
- **554 Sires with -**
  - **Minimum .20 accuracy**
  - **Minimum 10 progeny and two groups**
- **Web-based listing and downloadable spreadsheet**
- **Sire listing in the Sire Evaluation Report**

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3201 Frederick Avenue • St. Joseph, MO 64506 • (816) 383-5100 • Fax (816) 233-9703 • E-mail: angus@angus.org

Sire Evaluation   More Info   Available Searches   E-mail

Angus Sire Evaluation Report - Spring 2008

Disclaimer -- Please read before continuing.
Introduction
How To Read The Results - Definitions

Instructions
Search the Angus Sire Evaluation Database

Spring 2008 Highlights

Research Docility Genetic Evaluation
   Background
   Research report
   Use of Docility EPDs
   View Sires

Research Heifer Pregnancy Genetic Evaluation
   Background
   Research report
   Use of Heifer Pregnancy EPDs
   View Sires

Tables

Docility EPDs

Docility EPD (DOC)	
Bull A	+8%
Bull B	-2%
Difference	+10%

- **Higher EPDs are more favorable.**
- **Avg. EPD = 8%**

- **Use as a tool to increase the chance of more docile calves.**

- **On the average, expect 10 more calves out of 100 to have a temperament score in the most docile category (score=1).**

- **In herds where temperament problems are <u>not</u> an issue, this expected difference would not be realized.**

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Angus Sire Evaluation Report - Spring 2008
Docility EPD   Excel Spreadsheet

Reg. No.	Name	Tattoo	Birth Date	EPD	ACC
14485468	2B Bon View New Design 204	204	02/03/2002	+0	.34
13850307	4 Point 8 of Ironwood	1397	04/02/2001	-9	.53
13327955	6 R EXT 912	912	03/24/1999	-6	.41
14552920	9 Peaks New Design 3509	3509	02/10/2003	-1	.36
12448729	A A R Really Windy 1205	1205	02/26/1995	+21	.58
13768273	A C 036-8180	180	02/25/2000	+15	.47
14003411	A C Headline 001	001	03/08/2001	+22	.37
14104837	ACF Ambush 1244	1244	09/04/2001	+6	.38
13977011	ACF SB Notch 1568	1568	09/30/2001	+16	.50
14768436	ADD Grand Designer	4572	02/24/2004	+19	.42
14707256	ADD North Design 4574	4574	02/24/2004	+12	.42
14707276	ADD Total Package 4618	4618	03/13/2004	+13	.34
13946207	AJC H A F Universe 33L	33L	09/18/2001	+13	.35
12176446	Alberda Traveler 416	416	01/25/1994	+1	.64
14560689	ALC Big Eye D09N	D09N	02/15/2003	+10	.43
13492024	Alc Jackpot R37J	R37J	03/16/1999	+11	.55
14072613	Alc Klass 1F3K	1F3K	08/22/2000	+15	.41
14376003	AVF E161 Precision 7083	7083	02/08/2003	-1	.59
12452829	B A R Ext Traveler 205	5205	01/28/1995	+4	.67
12048084	B C C Bushwacker 41-93	41	09/24/1993	+18	.85

Heifer Pregnancy EPDs

American Angus Association

Heifer Pregnancy Evaluation

Model:

- threshold analysis
- full animal model with 3-gen pedigree
- variance components from previous research by Minick-Bormann et al. (2006)
- Updated research Mark Enns, Colorado State

Heritability: .13

Heifer Pregnancy Evaluation

Effects:

- Contemporary group ⟶
- Age of dam of heifer
- Service sire
- Heifer age at first breeding
  (linear covariate)
- Direct animal genetic

Contemporary Group:

- Breeding herd
- Breeding year
- Season
- Group code
- Synch

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Research Heifer Pregnancy Genetic Evaluation
    Background
    Research report
    Use of Heifer Pregnancy EPDs
    View Sires

Tables

Angus Heifer Pregnancy

Genetic Evaluation

Initial Release – July 2007

- Sire EPDs (ACC at least .30)

  429 sires

- Web-based listing and downloadable spreadsheet

Angus Heifer Pregnancy

Genetic Evaluation

Spring 2008:

- Updated research report with **495 sires** listed.
- Include sire listing as a separate page in the printed Sire Evaluation Report.

Heifer Pregnancy EPDs

Heifer Pregnancy EPD (HP)	
Bull A	+10%
Bull B	+3%
Difference	+7%

- Higher EPDs are more favorable.
- Avg. EPD = 8%

- Use as a tool to increase the chance of more pregnant daughters from Bull A versus Bull B.
- On the average, expect 7 out of 100 more pregnant daughters of Bull A compared with daughters of Bull B.

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Sire Evaluation   More Info   Available Searches   E-mail

Angus Sire Evaluation Report - Spring 2008
Heifer Pregnancy EPD   Excel Spreadsheet

Reg. No.	Name	Tattoo	Birth Date	EPD	ACC
13932783	A & B Yukon Jack 1179	1179	03/14/2001	+7	.47
9958634	A A R New Trend	131	04/05/1981	+13	.73
12448729	A A R Really Windy 1205	1205	02/26/1995	+11	.35
12862009	A&b Yukon 7150	7150	05/02/1997	+11	.41
13624612	Acf Neutron 9218	9218	09/26/1999	+1	.33
13814603	ACF New Design 0252	0252	09/05/2000	+5	.30
12176446	Alberda Traveler 416	416	01/25/1994	+11	.68
12758219	Ankonian Elixir 100	094N	10/15/1996	+13	.45
12452829	B A R Ext Traveler 205	5205	01/28/1995	+8	.65
12048084	B C C Bushwacker 41-93	41	09/24/1993	+8	.75
12396224	B T Ultravox 297E	297E	04/06/1995	+7	.44
13286246	B/R Destination 727-928	928	01/22/1999	+15	.44
13043719	B/R Grand Design 849	849	01/29/1998	+5	.33
11418151	B/R New Design 036	036	02/02/1990	+10	.84
11928774	B/R New Design 323	323	01/22/1993	+0	.66
13286230	B/R New Design 323-9150	9150	02/13/1999	+7	.35
12784319	B/R New Dimension 7127	7127	02/09/1997	+13	.45
13588640	B/R New Frontier 095	095	01/31/2000	+13	.54
13412671	Baldridge Nebraska 901	901	01/11/1999	+8	.33
13427910	Bar S First Choice 9353	9353	03/04/1999	+7	.30

What is in the Future?

Genomics

- Reproduction
- Feed Efficiency
- Herd Health
- Carcass Merit

Marker Assisted Selection

Marker Assisted Selection