

**ACROSS-BREED TABLES
for 2007
with year 2005 Angus base**



Larry Kuehn
Dale Van Vleck
R. Mark Thallman
Larry Cundiff

Background

- Across-breed EPD adjustment factors have been computed for BIF since 1993
- Account for differences in EPD base in the genetic evaluations of each breed involved
- Uses USMARC Germplasm Evaluation (GPE) data to adjust for breed differences

Calculations

- 1) Solve for breed of sire solutions
USMARC GPE data
Sample of sires from participating breeds
All crosses adjusted to full heterosis (since '01)
- 2) Get EPD of GPE sires and of 2005 born animals from breed associations
Used to scale differences from GPE data to breed EPD reported in 2005

Calculations

- 3) Adjust USMARC solutions to year 2005
Change in method
Was:
 $USMARC(ADJ) = USMARC + b[\overline{EPD}_{05} - \overline{EPD}_{USMARC}]$
Now:
 $USMARC(ADJ) = USMARC/b + [\overline{EPD}_{05} - \overline{EPD}_{USMARC}]$

b is the fraction of EPD expressed in USMARC progeny phenotypes (expect b = 1.00)

Why the change?

- Was:
 $USMARC(ADJ) = USMARC + b[\overline{EPD}_{05} - \overline{EPD}_{USMARC}]$
Now:
 $USMARC(ADJ) = USMARC/b + [\overline{EPD}_{05} - \overline{EPD}_{USMARC}]$
- Original method adjusted USMARC bull sample to industry EPD average on a *USMARC scale*
 - New method adjusted converts USMARC phenotypes to an *industry scale*

Regression (b) of Performance on EPD at USMARC (lb/lb)

	Pooled over all breeds	
	Observed	Expected
Birth weight	1.04 ± .05	1.00
Wean weight	.87 ± .05	1.00
Yearling weight	1.14 ± .05	1.00
Maternal weaning weight	.58 ± .04	.50
Milk	1.09 ± .06	1.00

Effect of new method on predicted breed differences [USMARC(adj)]

$USMARC(ADJ) = USMARC/b + [EPD_{05} - EPD_{USMARC}]$

- For weaning weight (b = 0.87), breed differences at USMARC are widened
- For other traits (BW: b = 1.04; YW: b = 1.14; MILK: b = 1.09), breed differences are narrowed

Calculations

4) Compute adjustment factor (breed Y) relative to breed X (Angus) bull base:

$$[USMARC(Adj, Y) - USMARC(Adj, X)] - [\overline{EPD}_{05Y} - \overline{EPD}_{05X}]$$

All on an industry scale

Calculations

5) Use adjustment factor to compare bulls from different breeds:

bull i, breed Y: Table Factor + EPD(Y,i)
 bull j, breed Z: Table Factor + EPD(Z,j)

Other changes from 2006 analysis

- National Cattle Evaluation
 - Some slight changes in USMARC bull EPD averages and breed averages (most small)
- More BW, WW, YW records
 - More HE, AN, SI, LI, CH, GE, RA from reuse of Cycle VII sires in 2006
- For MWWT
 - 135 HE, AN (Cycle VII, VIII)
 - 80 SI, LI, CH, GE, RA (Cycle VII)
 - 40 Beefmaster and Brangus (Cycle VIII)

Differences from 2006

- Reflect changes in breed association EPD, added performance records for Cycle VII breeds, and added grandprogeny records
- Angus vs. others:
 - BWT: Angus lighter, most changes minor
 - WWT: Angus increased vs. most breeds
 - YWT: Angus decrease slightly vs. most breeds; still heavier in general

Numbers of Sires, Progeny, Daughters, and Grandprogeny by Breed of Sire: Weaning Weight and Milk

Breed	Number				Breed	Number			
	Sires	Prog	Dau	G Prog		Sires	Prog	Dau	G Prog
HE	112	1795	721	3024	MA	18	197	86	485
AN	106	1344	550	2307	GE	48	623	240	1086
SH	25	170	69	251	TA	7	191	78	341
SD	15	134	69	347	SA	27	176	87	351
BRN	40	509	216	880	RA	21	246	97	423
SI	47	650	244	1217	BV	7	183	92	502
LI	40	608	242	1193	BRS	21	208	43	136
CH	74	650	239	1108	BFM	22	215	51	152

Birth Weight Adjusted to Base Years of 2004 and 2005

Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	4.3	4.1	Maine-Anjou	6.5	7.2
Angus	0.0	0.0	Gelbvieh	4.3	3.8
Shorthorn	6.6	6.5	Tarentaise	2.3	2.2
South Devon	4.0	3.5	Salers	3.0	3.0
Brahman	12.0	11.6	Red Angus	1.1	0.6
Simmental	5.3	5.1	Braunvieh	4.8	3.8
Limousin	3.9	3.6	Brangus	4.9	4.9
Charolais	9.0	8.6	Beefmaster	7.3	7.1

*Note: 2006 estimates used previous methodology

Weaning Weight Adjusted to Base Years of 2004 and 2005

Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	-4.0	-4.1	Maine-Anjou	-5.1	-3.8
Angus	0.0	0.0	Gelbvieh	8.7	8.0
Shorthorn	5.1	6.5	Tarentaise	-2.8	-4.1
South Devon	3.2	2.7	Salers	6.0	7.0
Brahman	11.5	12.5	Red Angus	-11.1	-14.6
Simmental	18.2	17.3	Braunvieh	-1.6	-6.4
Limousin	-0.4	-3.7	Brangus	4.1	7.9
Charolais	20.3	21.8	Beefmaster	7.0	9.2

*Note: 2006 estimates used previous methodology

Yearling Weight Adjusted to Base Years of 2004 and 2005

Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	-24.2	-21.7	Maine-Anjou	-36.7	-28.3
Angus	0.0	0.0	Gelbvieh	-21.1	-21.2
Shorthorn	-5.9	-5.9	Tarentaise	-49.0	-44.7
South Devon	-3.8	-5.6	Salers	-3.6	-3.1
Brahman	-53.6	-48.2	Red Angus	-21.3	-22.3
Simmental	8.8	0.5	Braunvieh	-51.6	-50.7
Limousin	-24.8	-26.8	Brangus	-12.6	-8.4
Charolais	16.8	12.3	Beefmaster	-22.2	-18.3

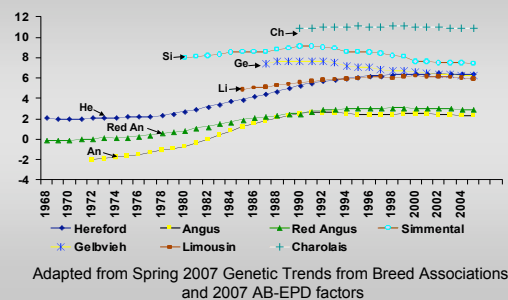
*Note: 2006 estimates used previous methodology

Maternal Milk Adjusted to Base Years of 2004 and 2005

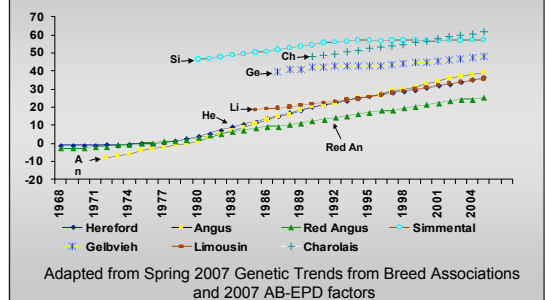
Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	-23.3	-20.7	Maine-Anjou	-7.8	-6.9
Angus	0.0	0.0	Gelbvieh	3.6	4.2
Shorthorn	-1.6	-1.4	Tarentaise	0.6	1.0
South Devon	-6.6	-4.5	Salers	0.9	1.2
Brahman	13.6	13.0	Red Angus	-12.1	-9.6
Simmental	-1.7	-1.5	Braunvieh	5.1	4.5
Limousin	-17.1	-13.2	Brangus	-11.7	-15.4
Charolais	-11.5	-10.2	Beefmaster	-24.1	-22.1

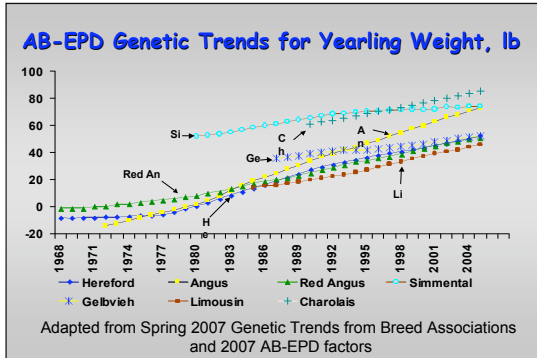
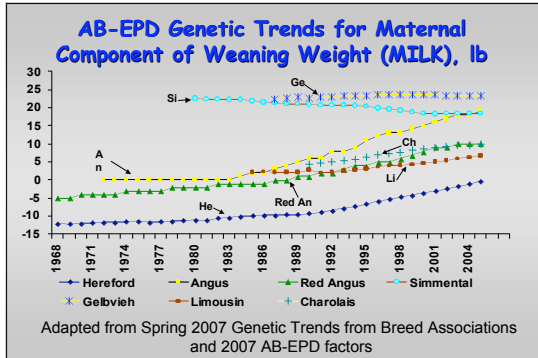
*Note: 2006 estimates used previous methodology

AB-EPD Genetic Trends for Birth Weight, lb



AB-EPD Genetic Trends for Weaning Weight, lb





BWT: Table Factors to Compare EPD of Bulls of Different Breeds (2006 and 2007)

Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	2.9	2.7	Maine-Anjou	6.3	7.1
Angus	0.0	0.0	Gelbvieh	4.7	4.4
Shorthorn	7.1	7.0	Tarentaise	3.1	3.0
South Devon	6.1	5.8	Salers	4.2	4.2
Brahman	12.5	12.1	Red Angus	3.0	2.5
Simmental	5.8	5.7	Braunvieh	6.0	6.3
Limousin	4.1	4.0	Brangus	5.2	5.0
Charolais	10.0	9.6	Beefmaster	9.2	9.0

*Note: 2006 estimates used previous methodology

Example: BWT

Breed	If Breed EPD	Table			Across-Breed EPD
Angus	2.6	+	0.0	=	2.6
Simmental	3.2	+	5.7	=	8.9
Red Angus	0.6	+	2.5	=	3.1

WWT: Table Factors to Compare EPD of Bulls of Different Breeds (2006 and 2007)

Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	-2.5	-4.1	Maine-Anjou	-6.2	-2.9
Angus	0.0	0.0	Gelbvieh	6.2	7.0
Shorthorn	30.6	32.5	Tarentaise	31.7	31.9
South Devon	22.6	23.1	Salers	29.0	30.7
Brahman	35.9	38.5	Red Angus	-1.6	-4.7
Simmental	22.6	24.4	Braunvieh	29.9	30.3
Limousin	1.8	-1.3	Brangus	19.9	24.3
Charolais	38.8	40.9	Beefmaster	38.5	42.2

*Note: 2006 estimates used previous methodology

YWT: Table Factors to Compare EPD of Bulls of Different Breeds (2006 and 2007)

Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	-15.7	-12.7	Maine-Anjou	-43.4	-31.9
Angus	0.0	0.0	Gelbvieh	-22.6	-21.2
Shorthorn	44.6	46.1	Tarentaise	11.5	18.3
South Devon	41.3	41.7	Salers	42.1	43.5
Brahman	-5.2	-2.6	Red Angus	-0.8	-0.7
Simmental	20.8	17.0	Braunvieh	11.9	17.4
Limousin	-21.5	-24.0	Brangus	21.1	26.5
Charolais	53.1	48.7	Beefmaster	37.3	43.7

*Note: 2006 estimates used previous methodology

MILK: Table Factors to Compare EPD of Bulls of Different Breeds (2006 and 2007)

Breed	Update		Breed	Update	
	2006*	2007		2006	2007
Hereford	-18.3	-15.7	Maine-Anjou	-7.2	-6.2
Angus	0.0	0.0	Gelbvieh	4.6	6.2
Shorthorn	15.0	16.6	Tarentaise	18.6	20.0
South Devon	5.3	8.0	Salers	11.2	12.8
Brahman	26.5	26.7	Red Angus	-8.1	-5.1
Simmental	11.9	13.7	Braunvieh	24.1	24.5
Limousin	-16.4	-12.6	Brangus	-2.6	-3.1
Charolais	1.3	3.5	Beefmaster	-7.1	-4.1

*Note: 2006 estimates used previous methodology

Breed Means and Deviations from Angus on Industry Scale (Spring, 2007 Genetic Evaluations; lb)

Breed	BWT	WNWT	YRWT	MILK
Hereford	84.1 (4.1)	614.4 (-4.1)	984.4 (-21.7)	-20.7
Angus	80.0 (0.0)	618.5 (0.0)	1006.5 (0.0)	0.0
Shorthorn	87.0 (7.0)	625.0 (6.5)	1000.6 (-5.9)	-1.4
S. Devon	83.5 (3.5)	621.2 (2.7)	1000.9 (-5.6)	-4.5
Brahman	91.6 (11.6)	631.0 (12.5)	958.3 (-48.2)	13.0
Simmental	85.7 (5.7)	635.8 (17.3)	1007.0 (0.5)	-1.5
Limousin	84.0 (4.0)	614.8 (-3.7)	979.7 (-26.8)	-13.2
Charolais	89.6 (9.6)	640.3 (21.8)	1018.8 (12.3)	-10.2
Maine Anjou	87.1 (7.1)	614.7 (-3.8)	978.2 (-28.3)	-6.9
Gelbvieh	83.8 (3.8)	626.5 (8.0)	985.3 (-21.2)	4.2
Tarentaise	82.2 (2.2)	614.4 (-4.1)	961.8 (-44.7)	1.0
Salers	84.2 (4.2)	625.5 (7.0)	1003.4 (-3.1)	1.2
Red Angus	80.6 (0.6)	618.5 (-14.6)	984.2 (-22.3)	-9.6
Braunvieh	83.8 (3.8)	597.5 (-6.4)	955.8 (-50.7)	4.5
Brangus	84.9 (4.9)	626.4 (7.9)	998.1 (-8.4)	-15.4
Beefmaster	87.1 (7.1)	627.7 (9.2)	988.2 (-18.3)	-22.1

Adjusted to 2005 mean for Angus (www.angus.org)

Questions?

**Considerations for
Across-Breed Factors for
Carcass Traits**



Larry Kuehn
Dale Van Vleck
R. Mark Thallman
Larry Cundiff

Carcass Trait Across-Breed Factors

- Have been discussing and looking at the possibility for a while
- Same idea as factors for weight traits
 - See if EPD predict differences we see at USMARC (regression of performance on EPD)
 - If so, adjust breed bases using the USMARC predicted breed differences

Concerns

- EPD less accurate
 - Getting better (primarily through Ultrasound)
- Fewer USMARC progeny
 - Will continue to increase (raise accuracy over time)
- Consistency of EPD between breeds
 - Ultrasound vs. traditional phenotypes and reporting
 - Endpoints for EPD in different breeds

Standardization of Carcass EPD

- Traditional carcass vs. ultrasound
- Subcommittee report
- Will help to compare EPD from different breed associations
- Possible to adjust EPD from US basis to carcass basis (Van Vleck et al., 2007) but producers must use regressions

Regression Coefficients

- This year still had three groups of EPD:
 - Traditional carcass (slaughter) basis only
 - Ultrasound basis
 - Combined (expressed as traditional) in a multi-trait model

Regression Coefficients

- Three traits
 - Marbling, fat thickness, and ribeye area
- Twelve breeds with carcass evaluations
 - 2-3 Traditional (includes Angus)
 - 3 Ultrasound (includes Angus)
 - 6-7 Combined

Traditional EPD To Predict USMARC Steers

Overall	N	Breeds ^(N)	Reg'n ± SE	Acc
Mar	786	2	1.03 ± 0.15	0.46
Fat	877	3	1.75 ± 0.25	0.45
Rib	787	2	1.82 ± 0.21	0.45
				(0.36 to 0.51)

90 to 504 progeny per breed

Ultrasound EPD To Predict USMARC Steers

Overall	N	Breeds ^(N)	Reg'n ± SE	Acc
Mar	1049	3	1.01 ± 0.17	0.36
Fat	1049	3	2.89 ± 0.38	0.39
Rib	1049	3	0.84 ± 0.18	0.40
				(0.26 to 0.57)

104 to 493 progeny per breed

Combined EPD To Predict USMARC Steers

Overall	N	Breeds ^(N)	Reg'n ± SE	Acc
Mar	920	7	0.70 ± 0.17	0.57
Fat	831	6	1.40 ± 0.34	0.58
Rib	921	7	1.45 ± 0.22	0.58
				(0.17 to 0.74)

34 to 264 progeny per breed (most 90)

Summary

- Regressions are significant within EPD type
- Fat thickness and, to a lesser extent, ribeye area have regressions > 1
- Combined group has grown (adding more next year), but doesn't include breeds with the most data

Regressions by breed

- Combined (6-7):
 - Fewer USMARC progeny/breed than other groups
 - Highly variable:

Marbling:	0.25 to 13.38
Fat thickness:	1.01 to 1.92
Ribeye area:	-1.31 to 3.66

Regressions by breed

- Traditional (2-3 breeds):
 - More USMARC progeny/breed
 - Less variable (but only 2-3 breeds):

Marbling:	0.91 to 1.81
Fat thickness:	1.43 to 3.87
Ribeye area:	1.73 to 1.91

Regressions by breed

- Ultrasound (3 breeds):
 - Most USMARC progeny/breed and overall
 - Still variable:

Marbling:	0.83 to 3.21
Fat thickness:	-0.37 to 3.05
Ribeye area:	0.74 to 0.94

What's next?

- Based on committee recommendations and implementation in evaluations, AB factors for carcass traits should appear in some form next year
- Data are still limited (relative to growth) and factors and breed comparisons are likely to change as the system is implemented

Questions?