


**ACROSS-BREED TABLES
for 2008
with year 2006 Angus base**



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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 2006 born animals from breed associations
Used to scale differences from GPE data to breed EPD reported in 2006

Calculations

- 3) Adjust USMARC solutions to year 2006

$$USMARC(ADJ) = USMARC/b + [\overline{EPD}_{06} - \overline{EPD}_{USMARC}]$$

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

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	1.05 ± .04	1.00
Weaning weight	.89 ± .05	1.00
Yearling weight	1.14 ± .05	1.00
Maternal weaning weight	.57 ± .04	.50
Milk	1.11 ± .06	1.00

Calculations

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

$$[USMARC(Adj, Y) - USMARC(Adj, X)] - [\overline{EPD}_{06Y} - \overline{EPD}_{06X}]$$

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)

Changes from 2007 analysis

- Addition of carcass trait analysis (more on that later)
- National Cattle Evaluation
 - Some slight changes in USMARC bull EPD averages and breed averages (S. Devon base shift)
- More BW, WW, YW records
 - More LI, CH, GE, RA from reuse of Cycle VII sires
- For MWWT
 - 106 HE, 78 AN (Cycle VII, VIII)
 - ~65 SM, LM, CH, GV, RA (Cycle VII)
 - ~35 BM and BN (Cycle VIII)

Differences from 2007

- Reflect changes in breed association EPD, added performance records for Cycle VII breeds, and added grandprogeny records
- Angus vs. others:
 - BWT: Changes minor
 - WWT: Angus continues to increase vs. most
 - YWT: Angus increased relative to most breeds; only Charolais heavier
 - MILK: Most breeds increased relative to Angus

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	1,796	721	3,130	MA	18	197	86	485
AN	106	1,345	550	2,429	GV	48	666	240	1,158
SH	25	170	69	251	TA	7	191	78	341
SD	15	134	69	347	SA	27	176	87	351
BR	40	509	216	880	RA	21	317	97	484
SM	48	648	244	1,281	BU	7	183	92	502
LM	40	681	242	1,262	BN	21	208	43	170
CH	74	681	239	1,169	BM	22	215	51	185

Birth Weight Breed Differences Adjusted to Birth Years of 2005 and 2006

Breed	Update		Breed	Update	
	2007	2008		2007	2008
Hereford	4.1	4.1	Maine-Anjou	7.2	6.7
Angus	0.0	0.0	Gelbvieh	3.8	4.1
Shorthorn	6.5	6.5	Tarentaise	2.2	2.3
South Devon	3.5	3.5	Salers	3.0	3.1
Brahman	11.6	11.9	Red Angus	0.6	0.9
Simmental	5.1	4.7	Braunvieh	3.8	4.2
Limousin	3.6	3.5	Brangus	4.9	5.1
Charolais	8.6	8.6	Beefmaster	7.1	7.4

Weaning Weight Breed Differences Adjusted to Birth Years of 2005 and 2006

Breed	Update		Breed	Update	
	2007	2008		2007	2008
Hereford	-4.1	-4.4	Maine-Anjou	-3.8	-5.1
Angus	0.0	0.0	Gelbvieh	8.0	3.5
Shorthorn	6.5	3.8	Tarentaise	-4.1	-6.0
South Devon	2.7	1.3	Salers	7.0	5.9
Brahman	12.5	9.6	Red Angus	-14.6	-16.1
Simmental	17.3	14.2	Braunvieh	-6.4	-7.0
Limousin	-3.7	-5.6	Brangus	7.9	9.1
Charolais	21.8	19.2	Beefmaster	9.2	10.8

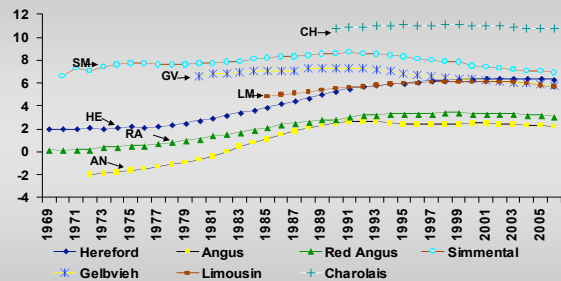
**Yearling Weight Breed Differences
Adjusted to Birth Years of 2005 and 2006**

Update		Update			
Breed	2007	2008	Breed	2007	2008
Hereford	-21.7	-22.3	Maine-Anjou	-28.3	-28.9
Angus	0.0	0.0	Gelbvieh	-21.2	-24.9
Shorthorn	-5.9	-8.2	Tarentaise	-44.7	-47.3
South Devon	-5.6	-7.5	Salers	-3.1	-4.7
Brahman	-48.2	-52.3	Red Angus	-22.3	-21.9
Simmental	0.5	-2.3	Braunvieh	-50.7	-50.0
Limousin	-26.8	-30.1	Brangus	-8.4	-8.7
Charolais	12.3	10.0	Beefmaster	-18.3	-19.1

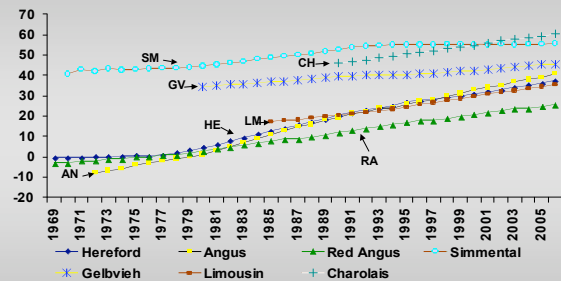
**Maternal Milk Breed Differences
Adjusted to Birth Years of 2005 and 2006**

Update		Update			
Breed	2007	2008	Breed	2007	2008
Hereford	-20.7	-19.3	Maine-Anjou	-6.9	-6.1
Angus	0.0	0.0	Gelbvieh	4.2	4.0
Shorthorn	-1.4	0.6	Tarentaise	1.0	1.5
South Devon	-4.5	-4.4	Salers	1.2	1.4
Brahman	13.0	13.4	Red Angus	-9.6	-7.8
Simmental	-1.5	-1.1	Braunvieh	4.5	5.3
Limousin	-13.2	-12.4	Brangus	-15.4	-15.2
Charolais	-10.2	-10.2	Beefmaster	-22.1	-20.3

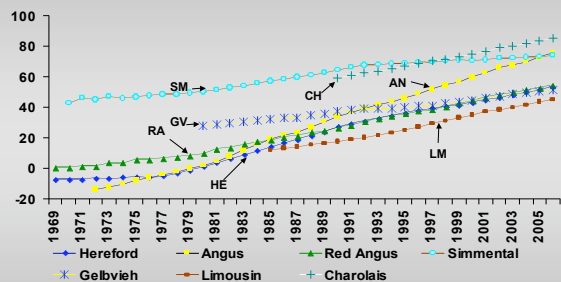
AB-EPD Genetic Trends for Birth Weight, lb



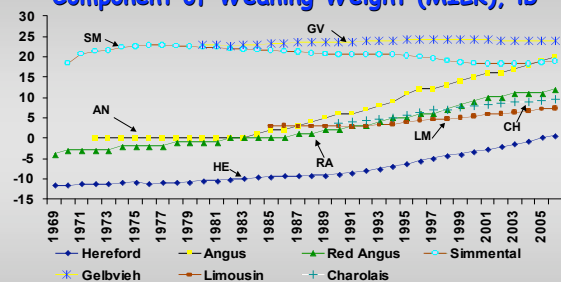
AB-EPD Genetic Trends for Weaning Weight, lb



AB-EPD Genetic Trends for Yearling Weight, lb



**AB-EPD Genetic Trends for Maternal
Component of Weaning Weight (MILK), lb**



BWT: Table Factors to Adjust EPD of Bulls of Different Breeds (2007 and 2008)

Breed	Update		Breed	Update	
	2007	2008		2007	2008
Hereford	2.7	2.7	Maine-Anjou	7.1	7.0
Angus	0.0	0.0	Gelbvieh	4.4	4.4
Shorthorn	7.0	6.5	Tarentaise	3.0	3.0
South Devon	5.8	3.3	Salers	4.2	4.2
Brahman	12.1	12.5	Red Angus	2.5	2.8
Simmental	5.7	5.4	Braunvieh	6.3	6.2
Limousin	4.0	4.0	Brangus	5.0	5.8
Charolais	9.6	9.6	Beefmaster	9.0	9.2

Example: BWT

Breed	If Breed		Across-Breed	
	EPD	Table	EPD	
Angus	2.6	+ 0.0	=	2.6
Simmental	3.2	+ 5.4	=	8.6
Red Angus	0.6	+ 2.8	=	3.4

WWT: Table Factors to Adjust EPD of Bulls of Different Breeds (2007 and 2008)

Breed	Update		Breed	Update	
	2007	2008		2007	2008
Hereford	-3.1	-2.9	Maine-Anjou	-2.9	-3.6
Angus	0.0	0.0	Gelbvieh	7.0	5.0
Shorthorn	32.5	31.0	Tarentaise	31.9	31.5
South Devon	23.1	3.6	Salers	30.7	30.3
Brahman	38.5	38.0	Red Angus	-4.7	-5.2
Simmental	24.4	23.3	Braunvieh	30.3	29.4
Limousin	-1.3	-3.8	Brangus	24.3	27.4
Charolais	40.9	39.0	Beefmaster	42.2	45.1

YWT: Table Factors to Adjust EPD of Bulls of Different Breeds (2007 and 2008)

Breed	Update		Breed	Update	
	2007	2008		2007	2008
Hereford	-12.7	-12.8	Maine-Anjou	-31.9	-31.6
Angus	0.0	0.0	Gelbvieh	-21.2	-22.4
Shorthorn	46.1	44.1	Tarentaise	18.3	18.2
South Devon	41.7	-5.7	Salers	43.5	43.4
Brahman	-2.6	2.5	Red Angus	-0.7	0.9
Simmental	17.0	16.9	Braunvieh	17.4	17.8
Limousin	-24.0	-27.8	Brangus	26.5	28.8
Charolais	48.7	47.3	Beefmaster	43.7	45.1

MILK: Table Factors to Adjust EPD of Bulls of Different Breeds (2007 and 2008)

Breed	Update		Breed	Update	
	2007	2008		2007	2008
Hereford	-15.7	-15.3	Maine-Anjou	-6.2	-6.0
Angus	0.0	0.0	Gelbvieh	6.2	7.0
Shorthorn	16.6	18.1	Tarentaise	20.0	20.5
South Devon	8.0	-5.6	Salers	12.8	13.1
Brahman	26.7	27.5	Red Angus	-5.1	-3.9
Simmental	13.7	13.9	Braunvieh	24.5	25.3
Limousin	-12.6	-11.9	Brangus	-3.1	-3.9
Charolais	3.5	2.9	Beefmaster	-4.1	-2.1

Breed of Sire Means and Deviations from Angus on Industry Scale (Spring, 2008 Genetic Evaluations; lb)

Breed	BWT*	WWT*	YWT*	MILK
Hereford	89 (4.1)	519 (-4.4)	884 (-22.3)	-19.3
Angus	85 (0.0)	524 (0.0)	906 (0.0)	0.0
Shorthorn	91 (6.5)	527 (3.8)	898 (-8.2)	0.6
S. Devon	88 (3.3)	525 (1.3)	899 (-7.5)	-4.4
Brahman	96 (12.5)	533 (9.6)	854 (-52.3)	13.4
Simmental	89 (4.7)	538 (14.2)	904 (-2.3)	-1.1
Limousin	88 (3.5)	518 (-5.6)	876 (-30.1)	-12.4
Charolais	93 (8.6)	543 (19.2)	916 (10.0)	-10.2
Maine Anjou	91 (6.7)	518 (-5.1)	878 (-28.9)	-6.1
Gelbvieh	89 (4.1)	527 (3.5)	881 (-24.9)	4.0
Tarentaise	87 (2.3)	518 (-6.0)	859 (-47.3)	1.5
Salers	88 (3.1)	529 (5.9)	902 (-4.7)	1.4
Red Angus	85 (0.9)	507 (-16.1)	884 (-21.9)	-7.8
Braunvieh	89 (4.2)	517 (-7.0)	856 (-50.0)	5.3
Brangus	90 (5.1)	533 (9.1)	898 (-8.7)	-15.2
Beefmaster	92 (7.4)	534 (10.8)	887 (-19.1)	-20.3

*Adjusted to USMARC EPD and weight means for Angus

Questions?

**CARCASS ACROSS-BREED TABLES
for 2008 with 2006 Angus base
Initial Release - 8 breeds**



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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

- Traditional
 - 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

This year

- Methodology differences disappearing
 - To participate, breeds must calculate EPD with age-adjusted endpoint and report EPD on a carcass basis
 - This year, 8 breeds were able to supply EPDs in this form
 - More expected next year
 - Remember: this is the first year
 - EXPECT CHANGES in years to come

Breeds

Angus	Charolais
South Devon	Maine-Anjou
Simmental	Salers
Limousin*	Red Angus

*Factors for fat thickness were not calculated for Limousin

EPD Regressions To Predict USMARC Steer Performance

Overall	N	Reg'n ± SE	Acc
Marbling	1,478	0.74 ± 0.11	0.53
Ribeye area	1,480	1.36 ± 0.17	0.53
Fat thickness	1,224	0.69 ± 0.13	0.52 (0.18 to 0.75)

•Expectation of regression is 1.00

•34 to 556 progeny per breed

Carcass Trait Breed Differences Adjusted to a Birth Year of 2006

Breed	Marbling	Ribeye Area	Fat Thickness
Angus	0.00	0.00	0.000
South Devon	-0.32	0.19	-0.047
Simmental	-0.65	0.59	-0.334
Limousin	-0.93	0.84	
Charolais	-0.71	0.50	-0.365
Maine-Anjou	-0.77	0.90	-0.314
Salers	-0.30	0.42	-0.285
Red Angus	-0.02	-0.21	-0.072

Table Factors to Adjust Carcass EPD of Bulls of Different Breeds to an Angus Base

Breed	Marbling	Ribeye Area	Fat Thickness
Angus	0.00	0.00	0.000
South Devon	-0.57	0.07	-0.008
Simmental	-0.84	0.67	-0.335
Limousin	-1.08	0.58	
Charolais	-0.79	0.43	-0.355
Maine-Anjou	-1.08	0.84	-0.305
Salers	-0.10	0.52	-0.276
Red Angus	-0.02	-0.13	-0.062

Summary

- Regressions are significant within EPD type
- Marbling and fat thickness regressions <1
 - Implies differences at USMARC not big enough relative to industry
 - Some caution is warranted, especially relative to fat thickness this year
- Differences between breeds are in the expected direction and relative magnitude

Summary

- Data are still limited (relative to growth) and factors and breed comparisons are likely to change as the system is implemented
- More data being added to the system for next year
 - Should continue with new breeds for growth and carcass traits under new GPE

Future?

- Any thoughts on carcass results?
- Hope to increase number of breeds
 - Will depend on breed association decisions and methodology
- Future traits?
 - Carcass weight, calving ease, others?

Questions?