Mean EPDs Reported by Different Breeds

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Expected progeny differences (EPDs) have provided the beef industry with an effective tool to impact genetic improvement in beef cattle. The mean non-parent EPDs for each trait included in the most recent genetic evaluations for breeds of British and American origin are shown in Table 1 and those for breeds of Continental European Origin are shown in Table 2. Means for non-parent EPDs are shown for the birth year of 2004. The 2004 birth year was chosen because most cattle are yearlings when they are selected for use in seedstock or commercial production. In the most recent genetic evaluations yearling weights would have been available for only a limited number of calves born in 2005. The mean EPDs should not be used to compare animals of different breeds because EPDs are estimated from separate analyses for each breed. To compare animals from different breeds, across breed EPD factors must first be added to EPDs estimated separately for different breeds (see Across Breed EPD Tables reported by Van Vleck and Cundiff in these proceedings). However, mean EPDs are relevant for within breed comparisons. It is important to know how animals being considered for use as herd sires or as replacement females compare to their respective breed average. The mean EPDs shown in Tables 1 and 2 also show the traits included in genetic evaluations of seventeen different breeds.

EPDs have had a much greater impact on growth traits than other traits because they have been available over a longer period of time. Many breeds have improved calving ease through use of birth weight EPDs. Simmental and Gelbvieh have estimated EPDs for calving ease based on both birth weight and calving difficulty scores for more than 20 years, and a number of breeds have added calving ease EPDs more recently. By the mid-1990's EPDs for scrotal circumference were included in genetic evaluations by the Hereford and Limousin breeds and have been included in more recent genetic evaluations by a number of breeds.

For many years records and EPDs for carcass traits were available for only a limited number of sires and progeny. However, with development and increased use of ultrasound estimates for ribeye area, fat thickness and intramuscular fat (marbling) estimates of EPDs for fat thickness, ribeye area and marbling have been provided for at least three years by 11 breeds. Recent research indicates that significant change can be made by use of EPDs for carcass traits based primarily upon live animal ultrasound estimation of marbling, fat thickness, and ribeye area. For example in a recent analyses (Van Vleck and Cundiff, *unpublished*), we estimated coefficients of regression for carcass traits in steers (n = 2,602) produced in our Germplasm Evaluation Program at the U.S. Meat Animal Research Center (MARC) on EPDs for their sires (402 sires) from 2005 genetic evaluations of 11 breeds. Regression coefficients of 1.07 for marbling, 2.8 for fat thickness, and 0.88 for ribeye area suggest that EPDs can predict with reasonable accuracy differences due to sires in carcass traits of steers fed and managed to relatively heavy slaughter weights (1250 lbs) and degrees of fatness (means of 0.43 in for fat thickness) typical of commercial production systems in the U.S. It is not surprising that the regression coefficient for fat thickness (2.8) was greater than unity since the EPDs were based primarily on ultrasound estimates taken in seedstock herds on yearling

bulls or yearling heifers developed for use as replacements.

The EPDs for stayability, docility, mature weight, and mature height have been introduced in recent years by a few breeds. In the very recent past a number of breeds have been introducing EPDs for use in various of selection indices to facilitate selection to target specific portions of the industry (e.g., maternal populations, terminal sire populations, feedlot niches, or carcass grids).

Table 1. Birth year 2004 average EPD's from 2006 genetic evaluations for breeds of British and American origin

Trait	Angus	Beef-master	Brahman	Brangus	Hereford	Red Angus	Short-horn	South Devon
Birth weight (lb)	2.3	0.43	1.81	2.0	3.7	0.4	1.8	0.2
Weaning weight (lb)	38.5	7	14.1	22.7	37	29	13	19.1
Yearling weight (lb)	71.5	12	23.1	37.8	63	51	21	26.4
Yearling height (in)	0.4							
Milk (lb)	19.0	2	6.1	9.9	14	15	2	7.1
Total maternal (lb)		5.5		21.3	33	30	9	16.6
Calving ease direct (%)	4.0				-.2	4	0.1	
Calving ease maternal (%)	6.0				0.5	3	0.0	
Scrotal cir-cumference (cm)	0.33	0.11		0.59	0.6			
Heifer pregnancy (%)						8		
Mature weight, lb	31.5							
Mature height, in	.5							
Current sire cow energy, savings, ($EN, $/cow/yr)	8.19							
Mature cow maintenance, (Mcal/mo)						3		
Stayability (%)						10		
Carcass wt (lb)	5						-3	0
Carcass marbling score	.14						-.02	
Carcass ribeye area (sq in)	.13						-.04	
Carcass fat thickness (in)	-.001					0.0	0.0	
Carcass retail product (%)							-.02	
Ultrasound intra muscular fat (%)	.115			.021	.00			
Ultrasound fat thickness (in)	.004			-.001	.001			

Table 1. Birth year 2004 average EPD's from 2006 genetic evaluations for breeds of British and American origin (continued)

Trait	Angus	Beef-master	Brahman	Brangus	Hereford	Red Angus	Short-horn	South Devon
Ultrasound rib-eye area (sq in)	.195			.032	.08			
Carcass and ultrasound marbling						.08		0
Carcass and ultrasound ribeye area (sq in)						.03		0
Carcass and ultrasound fat thickness (in)								0
Current sire weaning value ($)	22.45							
Current sire feedlot value ($)	16.48							
Current sire grid value ($)	14.15							
Current sire beef value ($)	30.08							
Maternal index ($)					15			
Calving ease index ($)					14			
Brahman influ-enced index ($)					16			
Certified Hereford Beef Index ($)					16			

Table 2. Birth year 2004 average EPD's from 2006 genetic evaluations for breeds of Continental European origin

Trait	Braun-vieh	Char-olais	Chia-nina	Gelb-vieh	Lim-ousin	Maine Anjou	Salers	Simm-ental	Taren-taise
Birth weight (lb)	1.1	1.3	1.1	1.9	2.05	2.49	1.1	1.8	1.5
Weaning weight (lb)	7	20.0	34.2	41	36.3	39.6	15.5	34.1	4
Yearling weight (lb)	8	35.2	61.0	73	68.2	78.2	25.8	59.5	11
Milk (lb)	0	6.2	10.6	18	18.3	18.4	8.7	5.4	1
Total maternal (lb)	4	16.2	27.7	37		38.1	16.4	22.4	
Calving ease direct (%)	-.02			104	6.0			5.6	0
Calving ease maternal (%)	-.9				2.7			2.4	1
Scrotal cir-cumference (cm)		0.58		0.4	0.25		0.3		
Dolicity score					12.6		0.7		
Gestation length, d				-1.4					
Stayability (%)				5	16.4		16.3	17.3	
Carcass weight (lb)		13.06	3.5	0.9	15.2		18.3	-2.1	
Carcass marbling score		-.01		-.04					
Carcass ribeye area (sq in)		0.18		0.07					
Carcass fat thickness (in)		-.001		0.00					
Ultrasound fat thickness (in)			.01						
Ultrasound ribeye area (sq in)			-.02						

Table 2. Birth year 2004 average EPD's from 2006 genetic evaluations for breeds of Continental European origin (Continued)									
Trait	Braun-vieh	Char-olais	Chia-nina	Gelb-vieh	Lim-ousin	Maine Anjou	Salers	Simm-ental	Taren-taise
Carcass and ultrasound marbling			.02		-.01		-0.1	0.07	
Carcass and ultrasound ribeye area (sq in)					.11		.01		
Carcass and ultrasound fat thickness (in)							0.0	0.01	
Carcass and ultrasound retail product (%)			-.03				0.1		
Carcass and ultrasound yield grade					0.03			-.02	
Current sire feedlot value ($)				13.88					
Current sire grid value ($)				11.59					
Maternal index ($)					41.4				
All purpose index ($)								89.3	
Terminal index ($)								60.2	