2017 Across-Breed EPDs

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Most breed associations publish EPDs on an annual, biannual or weekly basis. These EPDs predict differences expected in the performance of future progeny of two or more bulls within the same breed for various traits. Normally, the EPDs of bulls from different breeds cannot be compared because most breed associations compute their EPDs in separate analyses, and each breed has a different base point.

In order to compare individuals across breeds, adjustments are needed for the within breed EPDs. Computation of the adjustment factors requires direct comparison of progeny of sires of those breeds when all sires are mated to dams with the same breed composition. Those comparisons are only available from the Germplasm Evaluation Program at the U.S. Meat Animal Research Center (USMARC).

Across-breed adjustments for growth traits and maternal milk have been calculated on an annual basis at USMARC since 1993. Adjustment factors for carcass traits have been calculated since 2009, and carcass weight was added in 2015. Breeds included must have carcass data in the USMARC database and report their carcass EPDs on an actual carcass basis using an age-adjusted endpoint.

Bulls of different breeds can be compared on the same EPD scale by adding the appropriate adjustment factor to the EPDs produced in the most recent genetic evaluation of the 18 breeds. Normally, the EPDs of animals from different breeds cannot be compared because most breed associations compute their EPDs in a separate analyses and each breed has a different base point. The adjustment factors in Figure 1 were updated using EPDs from the most recent national cattle evaluation conducted by each of the 18 breed associations as of December 2017. It is important to note that the factors in Figure 1 do not represent a direct comparison among the different breeds because of the base differences between the breeds. The factors adjust the EPDs to an Angus base, which was arbitrarily chosen. That is why there are no adjustment factors for the Angus breed.

As an example, in comparing a Hereford bull that has a Birth Weight EPD of 3.4 with a Simmental bull that has a Birth Weight EPD of 1.1, you would then add the appropriate breed adjustment factor to each bull's actual breed EPD and then compare them. The Hereford bull's Across-Breed EPD (AB-EPD) for birth weight would be 5.0 (3.4 + 1.6), and the Simmental bull's AB-EPD for birth weight would be 4.0 (1.1 + 2.9). The expected average difference in birth weight of their progeny when mated to cows of a different breed would be 1.0 pound (5.0 – 4.0 = 1).

Since there are no adjustment factors for Angus, their actual EPD would also be their AB-EPD. As an example, an Angus bull who had an actual weaning weight EPD of 52 would have an AB-EPD for weaning weight of 52 (52 + 0). If you were to compare him to a Charolais bull with an actual weaning weight EPD of 25 you would have to calculate the Charolais' AB-EPD for weaning weight. The Charolais bull's AB-EPD for weaning weight would be 57.5 (25 + 32.5). The expected average difference in weaning weight of their progeny when mated to cows of a different breed would be 5.5 pounds (57.5 – 52 = 5.5).

The across-breed adjustment factors allow commercial producers to compare the EPDs for animals of different breeds on the same scale for those traits. AB-EPDs are most useful to commercial producers purchasing bulls of two or more breeds for use in a systematic crossbreeding program. They can be used by commercial producers as a tool to optimize performance levels in commercial herds that implement

crossbreeding systems to exploit heterosis and match genetic potential to environment, feed resources, climate and market targets. Uniformity of AB-EPDS should be emphasized in selection of bulls for use in rotational crossbreeding systems to improve not only uniformity of calves produced in successive generations, but also the nutritional requirements of replacement females saved in successive generations of the rotation program.

Figure 1. Adjustment factors to add to EPDs of 18 different breeds to estimate across-breed EPDs

Breed	Birth Wt. (lb)	Weaning Wt. (lb)	Yearling Wt. (lb)	Maternal Milk (lb)	Marbling Scorea	Ribeye Area (in2)	Fat Thickness (in)	Carcass Wt.(lb)
Angus	0	0	0	0	0	0	0	0
Hereford	1.6	-18.2	-42.1	-14.1	-0.29	-0.06	-0.075	-72.4
Red Angus	2.3	-28.3	-35.4	5.5	-0.13	0.06	-0.017	-16.6
Shorthorn	4.2	-39.8	-32.8	3.6	-0.13	0.60	-0.103	-18.3
South Devon	2.3	-32.5	-55.2	14.1	-0.47	0.66	-0.220	-67.2
Beefmaster	4.5	21.9	-0.3	9.9				
Brahman	10.6	49.5	15.8	19.4	-0.64	0.10	-0.169	-33.9
Brangus	3.3	13.9	4.5	12.3				
Santa Gertrudis	4.8	38.3	38.4	17.7	-0.46	0.04	-0.086	-8.80
Braunvieh	2.4	-24.0	-43.3	4.7	-0.58	1.11	-0.107	-48.9
Charolais	6.9	32.5	23.2	5.5	-0.26	1.21	-0.204	8.10
Chiangus	2.8	-19.3	-29.9	0.9	-0.16	0.57	-0.095	-18.5
Gelbvieh	2.8	-22.3	-32.1	6.5	-0.25	0.86	-0.103	-20.2
Limousin	1.7	-21.5	-46.9	-7.4	-0.22	1.13	-0.101	-21.6
Maine-Anjou	2.4	-33.3	-52.4	-7.0	-0.44	0.93	-0.184	-33.0
Salers	0.9	-16.5	-46.3	8.1	0.06	1.03	-0.179	-46.7
Simmental	2.9	-8.90	-14.9	3.8	-0.21	0.51	-0.105	-2.90
Tarentaise	3.4	18.5	-11.6	20.8				

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