## 2015 ACROSS-BREED EPD TABLE

A table of adjustment factors used to estimate across-breed expected progeny differences (AB-EPDs) for eighteen breeds was released at the Beef Improvement Federation Annual Meeting in Biloxi, MS on June 11 (see Table 1). Across-breed adjustment factors have been calculated for growth traits and maternal milk since 1993. Adjustment factors for carcass traits have been calculated since 2009 and this year carcass weight was added for the first time; to be included, breeds must have carcass data in the U.S. Meat Animal Research Center (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 evaluations for each of the eighteen breeds. The AB-EPDs are most useful to commercial producers purchasing bulls of more than one breed to use in cross-breeding programs. For example, in terminal cross-breeding systems, AB-EPDs can be used to identify bulls in different breeds with high growth potential or favorable carcass characteristics.

As an example, suppose a Red Angus bull has a weaning weight EPD of + 68.0 lb and a Hereford bull has a weaning weight EPD of + 45.0 lb. The across-breed adjustment factors for weaning weight (see Table 1) are –25.7 lb for Red Angus and -4.4 lb for Hereford. The AB-EPD is 68.0 lb – 25.7 lb = 42.3 lb for the Red Angus bull and 45.0 - 4.4 = 40.6 lb for the Hereford bull. The expected weaning weight difference when both are mated to cows of another breed (e.g., Angus) would be 42.3 lb – 40.6 lb = 1.7 lb.

Most breed associations publish EPDs at least on an annual basis. These EPDs predict differences expected in performance of future progeny of two or more bulls within the same breed for traits including birth weight, weaning weight, yearling weight, and maternal milking ability (as reflected in progeny weaning weights). 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. The across-breed adjustment factors allow producers to compare the EPDs for animals from different breeds for these traits; these factors reflect both the current breed difference (for animals born in 2013) and differences in the breed base point. They should only be used with EPDs current as of June 2015 because of potential changes in EPD calculations from year-to-year.

It is important to note that the table factors (Table 1) do not represent a direct comparison among the different breeds because of base differences between the breeds. They should only be used to compare the EPDs (AB-EPDs) of animals in different breeds. To reduce confusion, breed of sire means (i.e., when sires from two different breeds are mated to cows of

a third, unrelated breed) for animals born in 2013 under conditions similar to USMARC are presented in Table 2.

The adjustment factors in Table 1 were updated using EPDs from the most recent national cattle evaluations conducted by each of the eighteen breed associations (current as of March 2015). The breed differences used to calculate the factors are based on comparisons of progeny of sires from each of these breeds in the Germplasm Evaluation Program at USMARC in Clay Center, Nebraska. These analyses were conducted by USMARC geneticists Larry Kuehn (email: Larry.Kuehn@ars.usda.gov; ph: 402-762-4352) and Mark Thallman (email: Mark.Thallman@ars.usda.gov; ph: 402-762-4261).

**TABLE 1: ADJUSTMENT FACTORS TO ADD TO EPDs OF EIGHTEEN DIFFERENT BREEDS TO ESTIMATE ACROSS BREED EPDs**

| Breed | Birth Wt. (lb) | Weaning Wt. (lb) | Yearling Wt. (lb) | Maternal Milk (lb) | Marbling Score[a] | Ribeye Area ($in^2$) | Fat Thickness (in) | Carcass Wt.(lb) |
|---|---|---|---|---|---|---|---|---|
| Angus | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.000 | 0.0 |
| Hereford | 2.7 | -4.4 | -26.6 | -17.8 | -0.32 | -0.10 | -0.053 | |
| Red Angus | 3.4 | -25.7 | -30.9 | 2.4 | -0.32 | 0.03 | -0.023 | -6.2 |
| Shorthorn | 5.1 | -30.7 | -12.3 | 4.6 | -0.24 | 0.31 | -0.107 | -11.6 |
| South Devon | 3.6 | -8.0 | -25.9 | 2.4 | -0.09 | 0.21 | -0.129 | -22.3 |
| Beefmaster | 5.7 | 36.1 | 32.3 | 11.9 | | | | |
| Brahman | 10.9 | 47.5 | 9.2 | 23.6 | -0.83 | -0.11 | -0.146 | -28.5 |
| Brangus | 3.9 | 13.9 | 5.1 | 4.6 | | | | -12.5 |
| Santa Gertrudis | 6.9 | 41.4 | 42.2 | 14.2 | -0.62 | -0.06 | -0.097 | -5.4 |
| Braunvieh | 2.5 | -22.1 | -49.3 | -0.4 | | | | -44.9 |
| Charolais | 8.6 | 39.6 | 40.8 | 7.3 | -0.39 | 0.98 | -0.207 | 5.4 |
| Chiangus | 3.5 | -26.9 | -38.8 | 0.2 | -0.40 | 0.34 | -0.114 | -20.9 |
| Gelbvieh | 2.7 | -21.5 | -30.4 | 1.6 | -0.33 | 0.65 | -0.117 | -22.6 |
| Limousin | 3.0 | -17.0 | -42.0 | -8.8 | -0.60 | 0.98 | | -13.4 |
| Maine-Anjou | 5.0 | -24.5 | -35.0 | -3.6 | -0.60 | 0.78 | -0.192 | -23.6 |
| Salers | 2.2 | -4.1 | -26.3 | 4.9 | -0.14 | 0.85 | -0.203 | -29.7 |
| Simmental | 3.6 | -4.8 | -9.5 | 3.6 | -0.38 | 0.43 | -0.137 | 3.8 |
| Tarentaise | 3.1 | 28.3 | 9.6 | 23.4 | | | | |

[a]Marbling score units: 4.00 = $Sl^{00}$; 5.00 = $Sm^{00}$

**TABLE 2: BREED OF SIRE MEANS FOR 2013 BORN ANIMALS**

**UNDER CONDITIONS SIMILAR TO USMARC**

| Breed | Birth Wt. (lb) | Weaning Wt. (lb) | Yearling Wt. (lb) | Maternal Milk (lb) | Marbling Score[a] | Ribeye Area ($in^2$) | Fat Thickness (in) | Carcass Wt.(lb) |
|---|---|---|---|---|---|---|---|---|
| Angus | 86.6 | 570.2 | 1041.9 | 558.2 | 6.14 | 13.24 | 0.668 | 904.9 |
| Hereford | 90.9 | 562.8 | 1004.2 | 536.4 | 5.36 | 12.93 | 0.606 | |
| Red Angus | 87.2 | 550.5 | 1009.9 | 557.6 | 5.72 | 12.86 | 0.632 | 886.6 |
| Shorthorn | 92.3 | 537.5 | 994.3 | 559.5 | 5.41 | 12.98 | 0.519 | 861.4 |
| South Devon | 91.0 | 555.4 | 1008.7 | 562.1 | 5.92 | 13.16 | 0.537 | 877.9 |
| Beefmaster | 90.9 | 566.3 | 1000.2 | 549.1 | | | | |
| Brahman | 97.7 | 583.7 | 988.5 | 564.4 | 4.79 | 12.63 | 0.509 | 845.5 |
| Brangus | 89.9 | 558.7 | 1005.1 | 549.3 | | | | 883.9 |
| Santa Gertrudis | 92.1 | 565.2 | 1001.2 | 549.7 | 4.97 | 12.66 | 0.561 | 870.8 |
| Braunvieh | 90.4 | 542.5 | 973.8 | 569.1 | | | | 848.3 |
| Charolais | 94.0 | 585.9 | 1042.2 | 551.0 | 5.25 | 13.99 | 0.452 | 894.2 |
| Chiangus | 90.9 | 536.6 | 977.2 | 552.2 | 5.36 | 13.26 | 0.502 | 862.4 |
| Gelbvieh | 88.6 | 566.2 | 1020.9 | 565.1 | 5.34 | 13.83 | 0.490 | 879.1 |
| Limousin | 89.9 | 567.5 | 1002.5 | 551.8 | 4.94 | 14.21 | | 885.4 |
| Maine-Anjou | 91.2 | 541.0 | 978.6 | 548.7 | 5.04 | 13.70 | 0.414 | 856.3 |
| Salers | 88.7 | 558.1 | 1007.6 | 559.1 | 5.46 | 13.62 | 0.453 | 865.2 |
| Simmental | 90.6 | 578.3 | 1035.3 | 560.7 | 5.35 | 13.93 | 0.469 | 903.4 |
| Tarentaise | 89.3 | 565.9 | 994.3 | 559.3 | | | | |

[a]Marbling score units: 4.00 = $Sl^{00}$; 5.00 = $Sm^{00}$