

Multi-Breed EPDs - Genetic Predictions of the Future

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In the July/August ARA Magazine, Dr. John Pollak discussed the changes soon to be seen in our current EPD production structure (The National Beef Cattle Evaluation Consortium and Multi-Breed Genetic Evaluation, pg. 20-24). The 'take-home' message Dr. Pollak presented was the avenue in which the majority of breed associations currently acquire their EPDs will not continue indefinitely. Universities involved in EPD production (Colorado State University, Cornell University, and University of Georgia) will be exiting the business of producing EPDs. Instead, they will work together through the National Beef Cattle Evaluation Consortium (NBCEC) to provide EPDs and research to the participating breed associations. The NBCEC's primary goal is to develop a sustainable genetic evaluation system for the beef industry. If RAAA attempted to maintain the current course, we would eventually be a breed with no option to produce EPDs domestically.

As Dr. Pollak concluded, the only feasible way for the NBCEC to develop a sustainable genetic evaluation system is to move to a Multi-Breed format. The basic definition of multi-breed EPDs: EPDs that are calculated using a pooled dataset including all participating breeds. All breeds' EPDs are calculated using the same formula and set on the same base.

What does Red Angus gain by pooling data with other breeds?

Many breed associations have a substantial number of Angus (Red and Black) cattle in their dataset due to Angus hybrids/composites. With a pooled dataset, Red Angus members would benefit by accessing Red Angus performance data from other breed associations. As we all know, the more data we have on animals the more reliable the EPDs are.

Five breed associations have already committed to the NBCEC Multi-Breed production evaluations: Red Angus, Brangus, Chianina, Gelbvieh and Maine Anjou. Simmental is in the process of moving their national cattle evaluation in-house, but has provided their historic data to be used in the Multi-Breed production run. Other breeds will join before the commitment deadline because there will be no other viable option. While other associations cannot match the history of RAAA's mandatory Total Herd Reporting (THR), the Brangus association is currently implementing the Beef Improvement Federation (BIF) recom-

mended mandatory THR. Gelbvieh and Simmental have a history of 'optional' THR. Initially, these 'optional' THR practicing breed associations present a question on the validity of the data entering the EPD calculations. However, breeds with 'optional' THR do not allow their members to switch back and forth between THR and non-THR. If a herd is non-THR, those members get pedigree only registration certificates. Also, breed associations with 'optional' THR do not include non-THR data in their data registries or EPD calculations. Given, 'optional' THR is not as progressive as RAAA's mandatory THR, but it is light years beyond 'report only the ones good enough to register'. Chianina and Maine Anjou are not under any form of THR; however, there are very few Red Angus influenced progeny registered with the Chianina or Maine Anjou associations. The bottom line is data from associations with non-mandatory THR will not corrupt Red Angus' EPDs.

RAAA has always defined the commercial producer as the breed's true customer, and can attribute most of our breed's growth to that. Many commercial producers utilize planned cross-breeding, another policy the RAAA supports. However, we have done little to assist those commercial producers, who utilize Red Angus in their cross-breeding system, to make accurate genetic selections. Currently, it is impossible to compare EPDs across breeds. This is mainly due to the fact that breeds use different EPD models

(formulas). For example: RAAA uses birthweights and calving ease scores for Calving Ease Direct (CED) EPD calculation; some breeds only use calving ease scores in their CED EPD calculation. Another fact that prevents direct across breed EPD comparisons is how breed associations use animals within their registry to set the zero EPD value (base). Therefore, all base calculations among breed associations are different. RAAA uses a set of high accuracy foundation animals. Some breeds adjust all EPDs to make 75 percent of the breed look favorable for each trait. Many breeds use this to make their breed look better than others. For example: Breed average BW EPD for Red Angus is 0.6 and the breed average BW EPD for Balancer (1/2 Angus, 1/2 Gelbvieh composite registered in the Gelbvieh Association) is -0.2. Which breed appears to be the low birth-weight breed? The Multi-Breed evaluation will present breeds' EPDs on a level playing field and eliminate the advantage breeds using this base adjustment currently enjoy.

Without the Multi-Breed EPDs, commercial producers are forced to use the Across Breed Adjustment Factors calculated and published by the Meat Animal Research Center (MARC). These factors attempt to put EPDs from all breed associations on a comparative basis. The accuracy of these factors have been questioned, but they are the best that we have at the present time. It is an understatement to say that the true accuracy of the MARC adjustment

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factors are inferior to a Multi-Breed evaluation.

The superiority of a Multi-Breed evaluation partly lies in the fact that all participating breeds EPDs are calculated using the same formula and set on the same base. Therefore, the resulting EPDs are directly comparable across participating breeds with unquestionable accuracy! Red Angus members will enjoy a competitive advantage by being the "Angus" breed that is written in the same language (directly comparable EPDs) as the majority of the beef industry.

With the Multi-Breed EPDs being on a different base than the current RAAA base, we will likely see a change in the 'look' of our EPDs. For example, a 45 Weaning Weight (WW) EPD under the current CSU model may be a 38 WW EPD under the Multi-Breed model. Unfortunately, the NBCEC EPDs that RAAA staff has seen in the reviewing process are raw, unbased EPDs. So, we are not sure if the Multi-Breed EPDs will be similar in numerical value as the current RAAA EPDs.

With animals being adjusted to a new base in the Multi-Breed evaluation, will this cause animals to re-rank?

A change in base will not cause animals to re-rank. As discussed above, all animals are adjusted using the same base adjustment (raw genetic value +/- base adjustment = published EPD). The only way an animal can re-rank is through the inclusion of new data. The Multi-Breed evaluation will include data from other breed associations, which will increase the number of Red Angus data points used in the EPD calculations. Thus, minor re-ranking is expected. In the Multi-Breed test evaluations previously performed, the Rank Correlations (which evaluate how many animals re-rank) between the CSU and NBCEC calculated EPDs have shown that very few animals re-rank with the inclusion of Red Angus data from other breeds. Preliminary statistics show that only 2 to 6 bulls per 100 bulls re-ranked for growth EPDs. RAAA bulls in the top 10% for YW will

still be in the top 10% for RAAA sires under the Multi-Breed evaluation. Growth bulls will still be growth bulls. Low birth bulls will remain low birth bulls.

One of the challenges the Multi-Breed evaluation has overcome is the accounting for heterosis in the EPD calculation of percentage cattle. This is due to the fact that heterosis can not be passed on to offspring, and heterosis has a different impact on performance for differing breed matings (i.e. British x Continental yields more heterosis than British x British). The current RAAA EPD formulas used at CSU do not have the capacity to separate performance due to heterosis from additive gene effects. Therefore, RAAA is forced to break contemporary groups based on percentage Red Angus (87 to 100% Red Angus, 50 to 86% Red Angus, 0 to 49% Red Angus, and any Brahman influence). This method attempts to eliminate wide ranges of heterotic effects, and achieves that goal reasonably well. However, those that have a good understanding of heterosis are aware that a 50% Red Angus, 50% Gelbvieh animal typically yields more heterosis (increased performance) than a 75% Red Angus, 25% Gelbvieh animal. Therefore, under the current CSU EPD model the additional performance in the 50% Red Angus animal over the 75% Red Angus animal may be seen as superior genetics, when it is actually heterosis! The Multi-Breed EPD formulas erase this potential error by accounting for heterosis! Not only will these advanced EPD formulas eliminate the advantage lower percentage cattle currently have within their % Red Angus groups, they will also allow all cattle from a particular member's herd to be contemporary grouped together regardless of breed composition (given same sex, management, feed code, age range at weight measurement, etc.).

Will my 1A Red Angus cattle be compared vs. non-Red Angus cattle from other herds?

Absolutely not! Ranch will remain the first criteria in the formation of contemporary

groups. In order for animals to be ratioed together they must be from the same ranch. If your herd consists only of 1A cattle, the only animals your cattle will be ratioed against are your other 1A cattle. If you produce 1A and Category III cattle, all calves from your herd may be contemporary grouped together, provided they are the same sex, management code, feed code, etc. Bottom line: Calves from your herd will only be ratioed against other calves from your herd.

Obviously, there are major benefits that Red Angus stands to gain with the implementation of Multi-Breed EPDs. RAAA has the quest of implementing the best science in EPD calculations in an effort to provide our members with unsurpassed genetic predictions to increase their bull market share. RAAA is convinced that Multi-Breed EPDs is the means by which we can continue to provide industry leading EPDs to our members that best describe their cattle.

The change from Single Breed to Multi-Breed EPDs is very similar to the change that RAAA made in 1979 from Estimated Breeding Values, which could only be used to compare animals within one herd, to across herd EPDs. This was a major change for RAAA members, as is the current one. All we have to do is look at breeds histories to realize that predicting and planning for industry change have often led to positive shifts in market share.

The beef industry's change to Multi-Breed EPDs is going to happen regardless of Red Angus' participation. The NBCEC will release Multi-Breed EPDs with or without Red Angus. The American Angus Association's Board of Directors have approved funding to produce Multi-Breed EPDs. American Simmental Association is in the process of moving their Multi-Breed EPD evaluation 'in-house'. If Red Angus chooses not to accept the Multi-Breed change, we should prepare ourselves to change from an industry leader to a follower.

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Recently Expressed Multi-Breed EPD Concerns:

Will RAAA continue to release an annual sire summary, and will it include all breeds participating in the NBCEC Multi-Breed evaluation?

RAAA will continue to publish a sire summary and it will only include sires registered in the RAAA. The current sire summary contains Category III sires, and it will continue to do so.

Concerning my bull market, won't a Multi-Breed evaluation give composites a competitive advantage? Thus, jeopardizing my bull market.

If a commercial producer desires to compare your Red Angus bulls against a composite that is registered with another breed association they already have the

ability to do so through the MARC Across Breed Adjustment Factors. The Multi-Breed evaluation forces the composites to be evaluated on the same playing field (formula, base) as other breeds. Additionally, the Multi-Breed evaluation will accurately account for heterosis effects in the composites, thus eliminating the possibility that increased performance due to heterosis could be seen as superior genetics. Your Red Angus bull customers will continue to buy Red Angus bulls because Red Angus is the breed that works for them and they will continue to buy Red Angus bulls from your program because your program is the program that yields what they desire.

What is the implementation timeline for the release of NBCEC calculated Multi-Breed EPDs?

In January 2007 RAAA is tentatively planning to release NBCEC calculated Multi-Breed Growth EPDs along with

CSU calculated Maintenance Energy (ME), Reproduction, and Carcass EPDs. In January 2008 RAAA will release NBCEC calculated Multi-Breed Growth and Carcass EPDs along with CSU calculated ME and Reproduction EPDs. In January 2009 RAAA will release NBCEC calculated Multi-Breed Growth, ME, Reproduction, and Carcass EPDs.

What plans does RAAA have to help members get acquainted with the look of the new Multi-Breed EPDs?

NBCEC has scheduled Multi-Breed production runs for this Fall. Once RAAA receives the Multi-Breed EPDs and if they are approved for release by the RAAA Technical Committee, RAAA will send out a Whole Herd EPD Report to all members which will display the CSU and NBCEC calculated Growth EPDs side-by-side. We will also provide member access to the Multi-Breed EPDs via the internet through REDS. ■