

Genomic Testing Females is an Investment in Your Genetic Future

By Tonya Amen, Ph.D., AGA Breed Improvement Consultant

If you've been breeding cattle long, you are aware of the costs associated with either raising or buying your replacement females. Yet, through the years, we've often placed more emphasis on bull selection. This is not without reason, of course, as bulls do contribute heavily to the genetic value of the herd each year. But, over her lifetime, a female can also leave a big mark on the genetics of a herd.

The use of genomic tests that are used to generate genomic-enhanced expected progeny difference (GE-EPDs) is used in seedstock for two primary reasons: 1) to improve the accuracy selection through increased accuracy of EPDs, or 2) for marketing purposes. Due to the impact of sires on genetic improvement and because, in seedstock operations, selling bulls is often the main income source, most breeders who decide to invest in genomic technology understandably start with the bulls. However, I'd like to present the case that females are also important candidates for testing.

Table 1 shows the progeny equivalents for traits currently evaluated in the American Gelbvieh Association's National Cattle Evaluation powered by BOLT. Progeny equivalents illustrate the average number of progeny that would have to be measured for a particular trait in order to achieve the

Table 1: Progeny Equivalents for GE-EPDs powered by BOLT

Trait	Progeny Equivalents
CED	15
CEM	3
BW	21
WW	22
YW	24
MILK	18
STAY	25

level of accuracy delivered on by a genomic test on young, genotyped, non-parents. For example, for a non-parent bull to achieve the level of accuracy delivered by a genomic test for calving ease direct (CED), a breeder would have to submit calving scores on 15 heifers whose calves were sired by him. For yearling weight, a breeder would need to submit 24 yearling weight records on his progeny to achieve the level of accuracy expected by genomic testing.

If we were to think about genomic testing heifers instead of the non-parent bulls, it become apparent that for most traits, a genomic test will deliver more EPD accuracy than if you submitted performance data for all the natural-service calves she has in her lifetime. What a tremendous investment in the genetic future of your herd! Not only will testing your females improve the accuracy of selection when it comes time to make your replacement heifer choices, but it will also help insure that you make the best mating choices when breeding time rolls around. By adding accuracy to her EPDs before the heifer is bred, you'll get a truer picture of her genetic strengths and weaknesses, which will give you better information when you select the bull to sire her calves. Additionally, the inclusion of parent verification with all high-density (GGP-HD) and low-density (GGP-LD) tests will help avoid inbreeding by ensuring the accuracy of the pedigree.

I'd like to direct your attention back to Table 1. You may have noticed that compared to the rest of the traits, calving ease maternal looks low. This is due to lack of genotypes on females – especially 2-year-old females. In fact, the lack of genotypes on females made it impossible to fit the maternal genomic component for calving ease. The majority of the genomic impact you see for CEM actually comes through its relationship with CED. Not only does genotyping females offer real benefits within your herd, but those genotypes are also necessary for the breed to have more accurate selection tools for maternal calving ease.

Of course, all of this is not meant to suggest that you should not use all the current tools in your heifer selection tool box (performance data, birth dates, visual appraisal) – all of these remain a very important part of your arsenal in heifer selection and cattle breeding. In fact, collecting performance data is more important than ever, as it is necessary to insure the efficacy of genomic tests as well. As always, though, we should remain vigilant in adding new tools that help add accuracy and efficiency to management decisions to ensure we are raising the best seedstock possible and supplying the best tools for selection and breeding to our commercial customers. ❁