



# By the Numbers

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## A new era in genomic testing

*One of the most common questions I get about genomic-enhanced expected progeny differences (GE-EPDs) and genomic tests is some version of, "When is the price going to drop?" Well, the day has arrived. AGI has begun offering low-density (LD) genomic tests from both of our partner labs. GeneSeek's product is the GGP-LD for Angus, and the Zoetis product is called i50K (the "i" stands for imputed).*

### HD or LD?

For profiling most animals, low-density testing will suit your needs. Through a process called imputation, LD tests can achieve nearly the same level of accuracy as high-density (HD) tests (Zoetis' HD 50K and GeneSeek's GGP-HD). When assessing the accuracy or power of LD tests, three components are important: 1) the concordance with HD; 2) the impact on genomic predictions; and 3) the accuracy of the resulting EPDs.

When we evaluate how well the LD



markers line up with HD markers, we find that in Angus there is 98% concordance. This means that if an animal were tested on both platforms, we would predict 98% of the same markers on LD as were actually read on HD.

To incorporate genomics into the EPDs, a value called a molecular breeding value (MBV) is calculated from the test results. This number is simply the sum of the effects for

each of the markers impacting the trait of interest. The correlation between MBVs from an LD test and MBVs from an HD test is 0.992, a nearly perfect relationship.

Finally, the current method of incorporating genomics into EPDs (the correlated trait method) will yield essentially no difference in the reported EPD accuracy between LD- and HD-tested animals.

### What is imputation?

I'm sure most of you have seen the puzzles floating around on the Internet that have sentences or even paragraphs that have a large number of letters missing or garbled, yet you can still read them. Here's an example of a sentence like that. Imputation works much the same way. Since such a large number of Angus animals have been tested with either HD 50K or GGP-HD, programs have been trained to read or interpret the markers (letters) that are missing on LD tests, such that the results are nearly indistinguishable from HD.

### Will HD still be available?

Yes, HD tests from both companies will still be available for purchase for those wishing to have their animals tested at that high level.

Furthermore, the LD imputation process in Angus cattle has a high level of accuracy because the amount of HD testing that has been done allows the prediction of the missing markers to be done with a high degree of certainty. With that in mind, it is still important that high-impact animals have HD test results in the Angus database.

We do anticipate that some animals initially tested on LD will need to be retested on HD at some point in order to retain imputation accuracy. Breeders will always have the option of upgrading LD-tested animals to an HD test, usually without submitting another sample. The Association may require an upgrade on animals producing a large number of progeny.

### What's the cost and how do I order?

Tests from both companies can be ordered in the same manner that all other genetic testing is ordered through AGI. Simply sign in to AAA Login and navigate to the "DNA Testing and Results" tab.

The cost for GeneSeek's GGP-LD is \$45 and the Zoetis i50K is \$47.

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