Are You Relying on the Best Sources for Genetic Information?

By Dr. H. Duane Norman

Everyone’s been hearing the term fake news lately.

While examples arise where fake news is a problem, the perceived frequency and seriousness depends on whom you ask. Regardless, all would likely agree that not all sources of information are equally useful. The same applies to genetics and management information supplied to dairy producers. One consideration: often the information is generated by the same companies marketing the products. This doesn’t automatically imply that the information will not be beneficial. In fact, sometimes it’s one of the few source – or even the only source – describing a beneficial product. Still it pays to be cautious as sometimes information can be misleading, and in other cases, excess data adds confusion.

Most revolutionary changes in dairy genetics over the last decade are due to the adoption of genomic testing. Breeding values are available on more traits, often improved via genomic information. Additional traits are being promoted by various groups. A few artificial insemination (AI) organizations have created new indexes for their bulls, derived from two or three traits, frequently traits not provided by their competitors. Other organizations offer rankings in conjunction with genotype services. Unfortunately, a transparent explanation is often not provided for most of these indexes. Without a clear understanding of the merits and methodology, it seems prudent to remain cautious and ask whether these independent rankings even approach the benefits provided through the lifetime merit indexes by the Council on Dairy Cattle Breeding (CDCB).

As you consider the genetic rankings now available, I offer these recommendations. First, make sure all potential service sires are ranked using a composite index that is appropriate for the economic situation of the herd. Be aware that screening out potential service sires strictly on individual traits (like bypassing any with negatives for PTA fat or PTA protein percentages) will result in less economic gain than a total commitment to a well-constructed index. Second, consider semen price – which is not determined strictly by genetic merit. Buyers need to be comfortable knowing which bulls they can acquire for a reasonable price and eliminate any that are overpriced. Next, purchase your semen supply from the list, taking into consideration how soon new genetic information will be available. Lastly, control inbreeding when mating individuals; mating programs can assist in this effort.

It is important to realize that one can achieve more economic progress improving several traits than if improving just a few. (Read more on this in the December 2018 CDCB Connection.) To maximize progress, one must use an index that incorporates all heritable traits of economic value. CDCB’s composite indexes incorporate as many as 38 traits. Be clear, the traits do not receive equal weight. Instead, the index is optimized because the
traits are weighted according to the economic value. There is sufficient emphasis on each trait where the directional improvement is obvious, so all traits will be improved.

What happens in the alternative schemes where individuals select their service sires by focusing just on a couple traits? Unfortunately, several other traits with economic value will deteriorate. Perhaps the best example was when the average daughter pregnancy rate for U.S. Holsteins declined from 38.8% in 1960 to 24.1% in 2000, in an era when producers directed most of their selection emphasis toward improving production. After the Productive Life evaluation was published and incorporated into Net Merit – followed soon with a direct evaluation for Daughter Pregnancy Rate – this decline in fertility reversed and began improving each year.

These indexes developed by USDA\(^2\) for CDCB are transparent and have been peer reviewed. The genetic change (progress) obtained in individual traits is published triannually on CDCB’s website. CDCB offers four lifetime merit indexes – net merit, cheese merit, fluid merit and grazing merit – to provide alternatives so producers under differing conditions can choose the index most appropriate for their herds’ management and milk pricing.

The returns to producers from using well-designed genetic indexes are enormous. If all selection in the U.S. would be based on NM\$, cows dying while in the milking herd is projected to decline from 17% to 10% within a decade. Then, salvage sales to U.S. producers could increase by as much as $394 million by the 10\(^{th}\) year. This is because genetic evaluations for Cow Livability have been developed and incorporated into all four CDCB composite indexes.

Remember, there are three key questions to ask:

- How many traits are in the alternative index provided by others?
- Are the traits included weighted appropriately and according to credible research?
- Will the index deliver benefits comparable to those provided by the four CDCB lifetime merit indexes?

CDCB continues to produce evaluations for more traits every year. As a result, producers will see changes in their cattle over the next decade, meeting their expectation for healthier, trouble-free animals.

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\(^2\)United States Department of Agriculture, Animal Genomics and Improvement Laboratory

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