Too Much Information

More hype than substance, some information breeders provide to their customers should be ignored.

by ***Troy Smith***

Never before have cow-calf producers been presented with more information to use in making decisions related to genetic selection. Some have complained that "information overload" is making the selection of seedstock more complicated instead of simpler. Potential buyers of bulls and females often are bombarded with weights and measurements, ratios and expected progeny differences (EPDs) for various genetic traits.

But isn't that all good stuff? Don't selection-savvy producers need every bit of data available to make intelligent, well-informed decisions?

Nope. Many geneticists would argue that producers are given too much information. The problem is that some of it is of little value, except perhaps for marketing hype. The most misleading, misused and even abused information includes "actual" weights and measurements of cattle. During the 2006 Beef Improvement Federation (BIF) annual meeting's ultrasound symposium in April, Auburn University's Lisa Kriese-Anderson drew attention to the matter, citing actual ultrasound measurements as a prime example of how data are misused.

Kriese-Anderson noted that as marketing programs rewarding carcass merit have developed, many seedstock breeders have adopted the use of ultrasound technology to measure carcass composition traits (ribeye area, fat thickness and percent intramuscular fat) of sire progeny. These live-animal measurements, as predictors of carcass merit, are used with actual carcass trait measurements from fed and harvested progeny to create the EPDs used in genetic selection of seedstock.

But how many times, asked Kriese-Anderson, do we see seedstock advertisements whose descriptions of featured animals include actual ultrasound measurements? A certain son of "Superbull" is touted for his 14-inch (in.) ribeye area, while another is credited with a 4% intramuscular fat measurement.

"The raw data is often used for marketing, but it shouldn't be," Kriese-Anderson explained. "Individual ultrasound measurements are useful, but only for comparisons within the group the animal came from."

Ultrasound data is most useful for helping rank sires or bloodlines with regard to particular carcass traits. "But it must be put in a comparison mode," Kriese-Anderson stated, "as a ratio or EPD."

Information misuse certainly isn't limited to ultrasound data, Kriese-Anderson said. Marketing efforts often focus on individual weights and measurements, such as a low actual birth weight, a scale-tipping weaning weight or an impressive scrotal circumference. The numbers might seem impressive, but when presented with actual data, producers have to ask, "Compared to what?"

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Contemporary comparisons

Proper genetic evaluation requires consideration of how well animals performed in comparison to herdmates raised under the same environmental conditions. Proper contemporary groups should be of the same sex and similar age, but they should also be raised under the same management. Calculation of EPD values is based on individual animal performance within its contemporary group, as well as the performance of the animal's parents and progeny. In short, EPDs sort out what is genetic and what's not.

University of Missouri geneticist Robert Weaber calls actual records the poorest kind of information for making genetic selection decisions because they reflect the effects of environment.

"The actual records contain variation in the trait of interest caused by non-genetic effects. For a trait like weaning weight, effects like age of calf at measurement, age of dam, sex and others can cause significant variation in a calf's actual performance record," Weaber explains.

"Because of this non-genetic variation, making selection decisions based on actual records is prone to error. Adjusted performance measures that account for known effects like age of calf and age of dam enable producers to more fairly compare contemporaries for a single farm or part of the herd. However, the average performance

CONTINUED ON PAGE 222

of a contemporary group is influenced a great deal by management and environment. Thus, producers should not use adjusted measures for across-herd comparisons of genetic merit."

According to Weaber, the consequences of using actual records for genetic selection are, at best, a reduction in response to selection. At worst, the use of actual records could lead a producer to pick the wrong genetics and do real harm to the breeding herd.

"Seedstock producers are doing their customers a disservice by continuing to promote animals using actual or adjusted data," Weaber states. "Not only can this dramatically misrepresent the genetic merit of an animal, it is also taking advantage of the naïveté of commercial producers who don't know better than to use this data."

In many cases, however, breeders claim customers are demanding to see actual records in addition to EPD values. Believing "the customer is always right," they fill their sale books and promotional materials with actual weights, adjusted weights, ratios, dam's ratios and more, along with the individual animal's EPD values.

Kansas State University (K-State) geneticist Dan Moser says attempting to apply all of it probably is the most common misuse of information. It's unnecessary because individual weights and measurements are already accounted for, through the calculation of EPD values for the various traits.

Moser says allowing an individual weight or ratio to overshadow an EPD value is like second-guessing your good scale. If the scale says a calf weighs 700 pounds (lb.), do you write down 650 because it doesn't look that heavy?

"An actual weight or ratio does tell us something about the animal's genetics, like a visual estimation tells us something about weight. Yet even the adjusted weight doesn't account for environmental effects like nutrition, nor does it consider pedigree information, so it is a less precise estimator of genetic merit, like a visual guess is a less precise estimator of weight," Moser explains.

Some producers justify consideration of individual weights because they feel EPD accuracy is low. Granted, the accuracy of genetic prediction is lower for a yearling bull than it is for a proven artificial insemination (AI) sire. However, Moser maintains that EPD values are more accurate than any other information available on that young animal.

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The accuracy of using individual weights, or weights and EPD values in combination, will always be lower than the accuracy of EPD-only selection.

"Instead of buying the bull with the +7 calving ease EPD and the 95-pound birth weight, suppose the producer buys the bull with +3 calving ease and an 80-pound birth weight and ends up pulling more calves than with the other bull," Moser warns. "It might be that the bull they bought was out of a first-calf heifer, which reduced the birth weight relative to his genetics. If the bull's EPD and his actual weight don't match, there's a reason for that, and the EPD is always the better indicator of his genetic merit."

To make bull selection easier, Moser recommends using EPDs or economic index values and ignoring actual weights, adjusted weights and ratios. That's the right way.

"And seedstock suppliers, breed association staff, Extension personnel and the press have an obligation to tell their customers when they aren't right," Moser adds. "When producers provide less meaningful information along with EPDs, they are sanctioning the use of that information in selection. Seedstock suppliers' customers make less genetic improvement than they might have, and their satisfaction with the product is less than it could have been."

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Partial reporting

Weaber urges seedstock producers to help reduce misuse of data by taking advantage of opportunities to report complete contemporary group data for as many traits as they can collect. Partial and selective reporting helps no one.

With partial reporting, for example, performance information on the bottom third or half of calves is not reported to the breed association. However, reporting only the best performers raises the average of the contemporary group. The result is that some animals that would have been above average if all calves were reported now rank below average.

Selective reporting is the improper construction of contemporary groups by omitting or dividing animals' records into groups for the purpose of improving the evaluation of an animal or its sire. While selective reporting can unfairly influence an animal's EPDs for the short term, Weaber says progeny data collected across herds will eventually reveal the genetic merit of the animal.

"In terms of genetic evaluation, partial or selective reporting has been shown to reduce the estimates of heritability and may also affect estimates of genetic correlations between traits," Weaber offers. "Complete data reporting will improve the accuracy of EPDs on bulls and cows in your herd and help you make better selections in the long run."

Weaber advises seedstock suppliers to encourage customer confidence in using EPD values for genetic selection. He also warns breeders against printing uninformative data in their sale books and advertising materials, since that gives customers an opportunity to make bad decisions.

"Print only the EPD values in sale catalogs and brochures," Moser echoes. "With all the space saved from removing the extraneous information, insert an explanation for why you did so. If customers insist on seeing the actual data, it could be provided upon request only, in a supplemental sheet. But it should have a big disclaimer at the top, stating geneticists have determined that using this information can be hazardous to your herd."