

Selection Savvy

Internet technology is putting a new twist on customized genetic selection.

by Kindra Gordon

Surf, sort, select. When it comes to genetic selection in 2006 and beyond, finding your "perfect" sire may be as easy as that little mantra — surf, sort, select. That's because the information about many of today's sires is at your fingertips through the World Wide Web.

As the industry adapts to the Internet age, genetic databases are being loaded online and technological advancements are heading toward customized selection computations.

Colorado State University (CSU) animal science professor Dorian Garrick explains it this way: Sire summaries of the past were like a telephone book. If you had a name, you could look it up. But, if you're looking for a trait leader, identifying that individual becomes much easier if you have an electronic database through which to sort.

To that end, several years ago breed associations began posting their sire



Dorian Garrick

summaries to the Internet and included the ability for online users to sort through the data. Once producers typed in the expected progeny difference (EPD) parameters they wanted, the database would produce a list of sires meeting the qualifications.

New bells and whistles

More recently, as some breeds have added indexes, those too are being posted online in searchable databases. For example, producers can log on to the American Angus Association Web site (www.angus.org) and enter registration numbers of individual animals. At the click of a mouse, they can receive dollar value indexes (\$Values), expressed in dollars per head, for those animals. Among the \$Values available are weaned calf value (\$W), feedlot value (\$F), grid value (\$G) and beef value (\$B).

Sally Northcutt, genetic research director for the American Angus Association, reports that the \$Value lookup on the Association's Web site has been a popular tool. "It's easy to use and puts the data right at people's fingertips," she says.

For even more in-depth data, Northcutt says Angus members can log on to the

Association's AAA Login database to view their own herd and produce a variety of customizable reports — including customized \$Values. "We've tried to be very accommodating to develop online tools for the membership," Northcutt says.

Of the customized \$Values, she explains, "It's a one-on-one tool producers can use to change different economic assumptions and produce outlooks for different scenarios."

For example, if a producer is evaluating sires based on \$W, he could change factors such as the base calf price, cow-heifer mix or feed energy cost and look at various outcomes. For instance, if he knew his cow-heifer ratio was 90:10 instead of the base 80:20, he could customize the index to make it more appropriate to his herd scenario.

Or, if \$B is being assessed, a breeder could sit down with a bull buyer and compute



Sally Northcutt

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scenarios for different Choice-Select spreads to estimate grid premiums.

Northcutt says the customizable option was created because the "what if" question came up a lot after the \$Values were introduced. "This allows Angus members to go in and ask those questions and create scenarios from the data," she says. Users can apply this to animals from their own herd, or enter a registration number and do it for a specific animal.

Northcutt says the Association is working to add a reproduction index to its suite of bioeconomic values. She notes, "That is a big piece we're interested in, but since those traits have low heritabilities, they are more difficult to assess."

Milk module

Another relatively new online tool offered by the Association is the Angus Optimal Milk Module. The purpose of this interactive module is to help producers identify the optimal Milk EPD for their operation.

The step-by-step program on the Association Web site asks producers to enter their herd's average cow weight, approximate milking ability, feed costs and feed variability. From that information, the Web-based program will compute an optimal milk EPD range for that particular herd.

University of Nevada Extension livestock specialist Ron Torell believes the module offers real insight for producers. "This is one more tool that can help producers see where they need to be for milk and frame," he says, adding that the online module is very user-friendly, with its drop-down and pop-up menus and step-by-step frames.

Torell recognizes that the module isn't an exact science, but he says it will put producers "in the ballpark" for milk EPDs in their herd. He adds that, by using the module, producers can get a better understanding of nutritional inputs in different scenarios.

Other online options

Outside of the Angus breed, computerized genetic selection is also gaining momentum. Last July at the Beef Improvement Federation

(BIF) meeting in Billings, Mont., a new, interactive Web-based tool was unveiled that goes beyond sire summaries, index selection, and even filtering programs linked to online sire summaries.

Developed by the National Beef Cattle Evaluation Consortium (NBCEC), the database was created by CSU and is designed to be a decision-support tool for producers to use when making selection decisions with EPDs and multi-breed evaluations.

By logging on to the site at <http://ert.agsci.colostate.edu>, producers are prompted to input production, management, genetic and economic information from their herd, and then select a few interesting sires from the database. Based on that information, the Web site will compute and compare the effects of mating those specific sires to that herd. Garrick calls them *customized computations*.

"We're allowing producers the power to play with the models themselves," he says.

For instance, the model will mate your herd to each of the sires you select and create the corresponding daughter herds with their predicted production, incomes and costs.

"It won't tell you the best bull in the entire database," Garrick says, "but it will tell you the ramifications to your herd, including profit differences for each of the bulls you short-listed. By setting your herd's parameters, this is a way to see interactions between different economically relevant traits."

Presently, the public database includes only genetic information from the Red Angus breed. But, this spring sire data from Shorthorn, Brangus, Simmental, Limousin, Salers and South Devon cattle are to be added to the site for an inventory of 1 million artificial insemination (AI) sires and yearling bulls.

The American Angus Association is not currently part of the program, but Angus bulls with progeny in Red Angus or Simmental association databases will be represented with numbers established in those databases, Garrick reports.

Garrick emphasizes that Web-based decision support is not just another index. He says the distinction is that Web-based

decision support justifies why particular animals get the values they get; whereas, without customization, index selection applies middle-of-the-road production, management and economic considerations.

Regarding the future of genetic selection, Garrick says, "We believe better decision support will give better decisions for profit."

Mark Enns, CSU assistant professor of animal sciences, agrees, saying, "This Web site helps producers tailor genetic data specifically for their production system. We want this used next spring for the breeding season."

Enns says they've tried to account for the system's speed during development. He reports that in the test version, which simulates multiple-breed association databases, there have been no problems.

System updates

Enhancements planned for the CSU Web-based system include a factor to account for risks associated with using a sire with low accuracy.

"With the decision support system," Garrick says, "it is possible to generate a distribution of possible true EPD values for each trait on each bull and get a distribution of expected profit difference."

Another update for the system will be the ability to account for multi-breed circumstances and crossbreeding.

"At the moment, you have to read the across-breed EPD table published by USDA's (the U.S. Department of Agriculture's) Meat Animal Research Center (MARC) and do the calculations yourself. But, this system will in a future update directly use multi-breed EPDs," Garrick says. He adds that the decision-support tool has the ability to simulate calves for each bull, accounting for the effects of heterosis for crossbred cattle. This will give the ability to compare the ramifications of using bulls of different breeds in your particular cow herd.

Garrick and Enns report that a postweaning component will eventually be added to the module to allow for carcass inputs to predict "days to finish," "feed to finish" and "value at finish" for the offspring of each bull. This will allow the ability to rank bulls on feedlot value, or on the combined cow-calf sector and feedlot sector value.