

A Step Closer to Reality

The NBCEC anticipates its first prototype multi-breed analysis by early October and launches educational effort to prepare industry.

by *Shauna Rose Hermel*

Within a year, the National Beef Cattle Evaluation Consortium (NBCEC) hopes to unveil to the industry its first attempt at a unified multi-breed analysis. It will take a large step in that direction by early October 2004 as it runs the first prototype analysis involving a subset of the 14 breeds that have agreed to participate (see "Multi-Breed Analysis," page 102, August *Angus Journal*).

Already, the NBCEC has launched an educational effort to prepare Extension specialists, artificial insemination (AI) companies and genetic consultants to assist producers in using the multi-breed expected progeny differences (MB-EPDs) and the accompanying decision-support tools.

This first prototype will include the data sets for five breeds collected by three breed associations, explains Dorian Garrick, professor of animal breeding and genetics at Colorado State University (CSU). Included will be the data collected by CSU for the Red Angus Association of America (RAAA), by the University of Georgia (UG) for the North American Limousin Foundation (NALF) and by Cornell University for the American Simmental Association (ASA).

The ASA evaluation includes data sets for the Maine-Anjou and Chianina breeds. All three evaluations include individual animals of other breeds that are involved in breeding composites and hybrids recorded within the respective associations. Among breeds with some animals included by default are Angus, Hereford and Brahman, Garrick explains.

A national pedigree file

"Right now we're in the process of building what we are referring to as the national pedigree file," explained Cornell geneticist John Pollak in mid-September. "We'll be adding performance records to that and hopefully trying to do some type of a prototype at the end of this month or early October."

Building the national pedigree file is no small feat, complicated by the fact that many of the breed evaluations contain the same animals under different identification numbers, Garrick explains. For instance, there are Angus bulls that can be found in all

three of the original data sets. Not finding those duplicate entries would diminish the accuracy of the analysis.

Some associations, like the RAAA, record the animal's original registration number. Others don't, which means the researchers have to resort to other approaches, such as looking at birth dates, to find the duplicate records, he says. "That requires much more hands-on intervention."

Of the four universities in the consortium — CSU, UG, Cornell and Iowa State University (ISU) — Cornell has the largest database capabilities, Pollak says, so it was chosen to build the prototype national pedigree and the national database, as well as to store the genetic evaluations once they are computed.

Cornell also had the experience of running a multi-breed analysis with the Simmental evaluation and experience in loading information from different breed associations through the Carcass Merit Project (CMP), Garrick adds.

At press time, Cornell was loading the Red Angus and Limousin performance data into its system. With that task completed, Garrick explains, Cornell will create an extract of the combined performance and pedigree files. That extract will be used to run the prototype multi-breed analysis.

Running the prototype

Two universities, Cornell and UG, have been selected to simultaneously run independent multi-breed analyses. The system at Cornell is jointly owned by Cornell and the ASA, while the UG system is built and owned by the University of Georgia.

"We're going to focus exclusively on the growth traits to begin with, because we have multi-breed systems for that," Pollak says, noting that the prototype will result in MB-EPDs for birth weight, weaning weight (direct and maternal) and yearling weight. The systems that are in place will serve as references to assist researchers in evaluating results.

"These prototype runs, as we're doing them this fall, are mainly for us to learn what the necessities would be in order to complete such a large evaluation — the computation,

computer time, computer space," Pollak says. "We'll do a run just to make sure we have hardware capabilities for handling that large of a data set, and then we'll just keep adding breeds to it through the fall."

Pollak expects the multi-breed analyses to challenge the systems at Cornell and Georgia. "There are some fairly significant increases in the amount of information that we're trying to put through them," Pollak explains. "We believe that at both places, based on what we know of our systems, that we are capable of doing it. We've just got to make sure that we can."

To get a feel for the volume increase in data being analyzed in the runs, consider that the Simmental, Chianina and Maine-Anjou breeds recorded 64,631 animals total in 2003. Red Angus recorded 42,994 head and Limousin 49,600. That's a grand total of 157,230 head of new animals registered in one year — more than double what has been run on even ASA's current system. The actual analysis would include current live animals and their ancestors.

In comparison, the two largest breed associations, Hereford and Angus, registered 69,316 and 281,965 head in 2003, respectively. Both breeds have so far abstained from participation in the consortium's multi-breed analysis.

Pollak views that as a good thing for the moment. "It's kind of nice to know, at least during this prototype run in the fall, we're working with breeds we feel we can handle," he explains. "We'll get an idea of the magnitude of the data that we're going to be working with. The Angus data set is large. The Hereford data set is large. . . . We have a chance to work up to that if either of them should choose to join."

The first prototype runs will provide MB-EPDs for the initial breeds adjusted to a common base. The consortium plans to pull out the data on animals contributed by a particular breed, including their composites, and release that data to the respective breed associations to analyze and provide feedback to improve the system.

Decisions will need to be made with regard to which system — Cornell's,

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Georgia's or a combination of both — will be used to do future analyses and whether the breed associations want to remain involved.

"Right now the breeds that are in it are not committed to stay through a production run. And those that are not in it are not excluded from the production run," Pollak says. "What we are trying to do right now is set up the logistics that will allow us to achieve a unified genetic evaluation."

Says Garrick, "By the time that is done, the breed associations that are involved will have a much better idea of all of the issues involved in uploading pedigree data, uploading performance data and doing cross-linkages. And at that stage, they will decide whether they want this to be a routine exercise and whether they want that to replace their current approaches."

As the first prototype is being fine-tuned, Pollak says they will continue to add to the national pedigree file with information from the other participating breeds. The NBCEC's multi-breed analysis won't be made available to the industry until all of the participating breeds are included, which he expects to happen by next fall.

Reporting to industry

Don't look for a published all-breed sire summary. The consortium won't be in the business of publishing anything, says the University of Kentucky's (UK's) Darrh Bullock, who chairs the NBCEC advisory board. "The data set would be available to the breed associations so they could pluck their data out of it, and then they would be responsible for publishing it."

At first the commercial industry may not see much difference, as the breed associations will determine how they want to display the results, he says. Some have said they plan to adjust the EPDs to their current base, at least at first, so the EPDs would look similar to what their seedstock producers are accustomed to seeing.

"It's going to be a stairstep approach," Bullock explains. "Some associations may want to educate producers on what multi-breed analysis is first, and then step into changing everything to a constant base."

The consortium does intend to make the MB-EPDs available to producers through a decision-support program being built at CSU by Garrick and his research team. In short, the online decision assistant would allow producers to describe the nature of their herds by answering questions on a survey, input search criteria to identify a group of potential sires, then compare individual bulls according to the economic

ramifications their MB-EPD profiles would have on that particular herd, considering its particular environment.

The module would also allow a producer to input registration numbers of bulls of different breeds and compare them based on the predicted difference in economic value they would have in that herd's situation.

Educational support

"There's going to be a huge educational effort that's going to have to go with this multi-breed analysis and the decision-support program," Bullock says. He and ISU's Daryl Strohbehn have led an educational effort to "train the trainers." Through on-site and Internet training sessions, Bullock and Strohbehn are providing training in genetic evaluation, ranging from the basics to molecular and quantitative genetics.

"We've been trying to bring the specialists along as we're developing the system so we don't all of a sudden throw this multi-breed analysis out there and say, 'Here's what you need to do with it,'" Bullock says.

The reception has been "fantastic," he adds, noting participation by specialists representing 33 states. Breed associations and AI companies have also participated.

Bullock says the initial reaction to the multi-breed analysis is often that it will make using EPDs much easier. In reality, it may not, creating what he says he hopes specialists will recognize as teachable moments.

"A lot of times we focus on what is easier, but I think we need to be focusing on what is better, and make what's better as easy as possible," he says.

Factoring in Angus

As outlined in the August *Angus Journal* article, the American Angus Association Board and staff have seen no incentive to participate in the multi-breed effort at this time.

The Association has already taken steps to prepare for impending retirements and lack of support for single-breed genetic evaluations at the university level by hiring one of the most well-respected geneticists in the country and bringing the Angus evaluation in-house. As director of genetic research, Sally Northcutt maintains oversight of the Angus database, which includes more than 14 million pedigrees and 13 million performance measures.

In policy, the Board has taken the stance that sharing the proprietary information maintained in the Angus evaluation with the consortium would do more to assist other

breeds than it would to enhance the competitive advantage of Angus members.

What are ramifications of the American Angus Association's not being involved in this prototype?

"The obvious advantage to the multi-breed system of having the Angus database included is that a lot of the composite animals and a lot of the breeds themselves tie back to that pedigree and those performance records on Angus animals," Pollak says, adding that it would increase the accuracy of the predictions generated by the system.

The disadvantage to the consortium if Angus were to be included, as pointed out earlier, is the potential of overloading the systems before they could be fine-tuned.

The advantage to Angus producers of being included in the analysis, Pollak says, would be that their animals would be available in the decision-support module with MB-EPDs established using the Angus database. Conversely, he continues, the disadvantage to them of not being included is that the multi-breed run would contain a subset of Angus animals with MB-EPDs established through data residing in other breed data sets, which may result in EPDs that are less accurate and appear to conflict with EPDs established in the Angus evaluation.

No plans to collect the data

Pollak stresses that the consortium in no way intends to get into the business of collecting data. The breed associations would still serve as the gatekeepers of the performance and pedigree data, feeding that information into the national pedigree file and national performance file on a regular basis.

And the breeds will likely want to continue to do their own breed analyses, at least for the traits the consortium hasn't included yet in the multi-breed analysis.

Pollak says the consortium will focus its efforts on developing the technology and the methodology. "At some point, we would like to see some entity take on the service work of doing the genetic evaluations."

He says the NBCEC recognizes that its structure for genetic evaluation is more tenuous than that of the dairy industry, for which the U.S. Department of Agriculture (USDA) conducts the genetic evaluations for the production traits at Beltsville, Md., with appropriations of about \$2 million per year. Future retirements of key personnel also have to be considered.

At a meeting in late August, he says, the consortium explained a vision in which the consortium itself would be broadened to include more than the initial four universities, allowing scientific teams from other

universities to be assigned specific research initiatives. While NBCEC would continue to do the research and development, which would keep the methodology in the public domain, the service aspect of generating the MB-EPDs could be turned over to "an entity."

"That entity might in fact be a university, it could be a consolidation of breed associations, or it could be a government thing," Pollak says. "We haven't defined it. We just want people to start thinking about all the possibilities."

"If the federal dollars continue long enough," he continues, "we might be able to put into place a system that is sustainable and not as risky as perhaps the current one might be deemed, given that there is only a small handful of people at the universities doing these things."

Funding is an issue

The consortium is funded with monies appropriated through a special grant administered by the USDA. The program was launched with an initial five-year plan

requesting \$1.8 million per year be distributed among its four universities. While not receiving the \$1.8 million request, it has received increasing yearly amounts of \$248,000, \$321,000, \$624,000 and \$627,000 in its first four years. Monies will be appropriated in October 2004 to be distributed in July 2005 for the fifth year of the initial game plan.

With that in place, Pollak feels secure about funding for the next 18-20 months; but, he notes, even within that five-year plan, obtaining the annual allocation hasn't been a given. And it has been one of the only special grants to receive increasing levels of funding during a time when homeland security issues have halted or diminished funding for several grants.

"In January we'll go in and ask for our extension," Pollak explains. "It will be important at that time that the industry make a decision as to how important it is to them. And if it is important to them, that they convince the legislators that we do need to carry on."

Progress made with multi-breed evaluation, DNA validation and efforts to develop and improve suites of EPDs by incorporating DNA and indices for economically relevant traits (ERTs) will help the argument for funding. So will the consortium's effort to broaden its university base to make it more national in scope.

If the consortium can stay in business for six to eight years, Pollak says, it could be developed into a sustainable system, making it less reliant on federal funding.

"In the end we've got to have — and that's the dream — we've got to have a commercial producer go online and assess any and every animal in the pool of potential parents," Pollak says. "And that means any and every animal — regardless of breed or make-up of breeds that define that particular animal. If it's out there 'for sale' as a seedstock animal, we've got to have it compared so we can make the right decisions."

Time will tell whether the dream will become reality.



PERSPECTIVES



Editor's Mailbox

► Readers' viewpoints submitted to our staff

Thanks for the support

This is a letter to the members of the American Angus Association in thanks of support and prayer.

To outline the purpose of this thanks, I will fill you in with a brief history. After graduating from college and receiving many congrats on that, I headed off to my first job in feed sales.

After a month of getting to know my area, I had three days of not feeling all that hot. Two doctor visits and an ultrasound later, I was scheduled for surgery, which was moved up twice. After a Tuesday surgery Jan. 28, I was called by phone on Friday to be informed that I had the rarest form of ovarian cancer, and I was being referred to a different hospital.

I participated in the Iowa Beef Expo Feb. 12 and then had surgery to remove my ovary, fallopian tube and various other cells and tissues within my abdomen. By Feb. 20 I had my staples removed and was informed that I would begin chemo Feb. 24.

There are two reasons for this letter. I wanted to update those who knew of my unfortunate illness that I am doing as well as hoped. I am left with a hideous scar on my tummy, but the survivability rate, reoccurrence rate and fertility rate look favorable.

Second, during the four five-day rounds of "in-house" chemo and eight weeks of individual shots, complete baldness, along with the home shots and the mountains of pills that I took, I was overwhelmed. Not only with all of that, but with the outpouring of concerns and hopeful thoughts. In all, totaling the letters, e-mails, cards, phone calls and visits, there were more than 1,000! The phone chain and e-mail chain started and never quit!!!! I received contact from every corner of the country and from nearly every state Angus association that I have

ever had contact with! As I began recovery, the home phone was never on the hook and Dad's cell phone was not any better. The e-mails were immediate and the cards poured in.

What I want to let everyone know is that I felt too lousy and was at times not strong enough to physically return the thank-yous, but I have kept each and every one of you in my prayers and hold all of my "Angus clan" very close to my heart.

What I want all of you to realize is that I would *not* be as healthy as I am today without every last one of the signatures on the cards. I had always been labeled a strong girl, and I knew that strength came from my "family," but I had not put into perspective the true size of it. Many of the sections of our family have been hit with losses, hardship and/or tragedy in recent years. And, unfortunately, we all know that there are more to come. In times of need we must stick together, and we must fight for each other. You all did a lot of fighting for me when I was down, and it is to you that I owe my ability to get back up and not only kick cancer's butt, but life's as well.

I am planning a wedding for Oct. 2 and would love to have you all there to celebrate it with me and my fiancé, Matt Rogers, a (slowly converting to Angus) Simmental breeder. We are holding the ceremony in late afternoon and then throwing a reception to not only celebrate our marriage, but to thank all of you for getting us to where we are today and making us the people that we are! We can't wait to start our lives together and become involved in the Association and hope to someday work, too, for you all in some way, although we know that we can never repay you!

— Emily Jayne Hartzell, Wilton, Iowa

