

The National Beef Cattle Evaluation Consortium and Multibreed Genetic Evaluation

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Analysis of beef cattle records to produce expected progeny differences (EPDs) has been ongoing for well over two decades. The responsibility for producing EPDs was a shared venture between breed associations and several universities. For example, Red Angus worked closely with Colorado State University for their EPDs as we at Cornell University have worked with the American Simmental Association. Breed associations maintained data and pedigree information as a component of their service to membership and exported this information to their respective partner university once or twice a year for the EPD calculations. The universities that historically were involved in this process were Iowa State, Colorado State, Cornell and the University of Georgia.



The commercial industry needs to have a more systematic way to select among seedstock. The commercial industry also needs to emphasize crossbreeding to maximize the benefits of heterosis both in calf performance and maternal performance.

This approach to providing the industry with EPDs (one I will refer to as the university model) is different to the approach taken for dairy cattle evaluations. The dairy industry has their genetic evaluations for production traits computed by a USDA research group located in Beltsville, Maryland. As such the dairy evaluations are subsidized by government funding, a point I will return to later in this article.

The university model was quite appropriate in the early days of developing EPDs. There was much research to do with the field data provided by breed associations, and the most efficient way to transfer the technology developed from that research was to have the universities building and running the genetic evaluation systems. The 80's and 90's saw many changes, including EPDs for new traits and new models for standard traits. There was a friendly competition among the universities for providing the most recent and sophisticated technology to the breed association partners. However, in the mid-90's, the university model for providing EPDs started to falter. There were a variety of factors that

worked together to undermine this model. I will discuss these as our response to them led to the creation the National Beef Cattle Evaluation Consortium (NBCEC) in 2001.

The money for producing EPDs came directly from breed associations. In the beginning, these funds were adequate to provide for staffing, research and travel for the investigators at each university. The universities contributed through faculty salaries, hardware maintenance, and even, at times, hard dollars through federal funding of research. We all know what happens to constant dollars over time, and 20 years is a very long time. At the same time the "effective" dollars from the industry and state and federal support of universities and, in particular, quantitative genetics were diminishing. Available dollars for research in genetics from those sources were finding their way more and more to molecular genetics. This later event led to many universities moving from animal breeding to molecular genetics with each new faculty hire, and the ramification of this was that we found it harder and harder to hire appropriately trained people to work on EPD research.

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Today it has become almost impossible to find and retain those people. And finally, the appetite for EPDs within the industry grew. In the 90's, information was being collected on new traits (e.g., ultrasound) and EPDs proliferated. At the universities, we found ourselves duplicating research efforts as well as building redundant evaluation programs. As an example, Cornell had developed a multibreed system, and the other breed associations were asking for that kind of system from their affiliated university. By the end of the 90's, it was obvious that something had to change.

At that time, several representatives of the beef industry approached the faculty at the universities and asked us to consider some way of consolidating our efforts. At a meeting, hosted by NCBA, the concept of the NBCEC was developed, and at the subsequent NCBA meeting, a resolution passed to seek government funding to support the creation of the consortium. We have received such funding each year since 2001, and our grant has been growing annually to its current level of approximately \$800,000 in this year's allocation. We have never, however, received our requested amount of \$1.8 million per year. These funds have afforded us the opportunity to organize our research programs and the personnel within our universities and to move forward with projects and programs in a more judicious manner.

The highest priority project in the NBCEC at this time is to help the industry establish a sustainable system for genetic evaluations. To this end we have established a vision. Our vision is that the service of genetic evaluations needs to be separated from the research and development programs. It is our hope that an entity evolves within the industry

to provide the service of computing EPDs and that the NBCEC would become the R & D organization for that entity. We realize it will take time to establish this new model for providing EPDs, and so we are committed to delivering EPDs through the year 2010. All software and database programs developed by the NBCEC will be available to the industry to use in the service entity.

The most vivid example of how the faculty at universities within the consortium has started to work as a team is the effort we are currently engaged in to produce multibreed genetic evaluations. When asked by several breed associations if we would create the infrastructure for a unified genetic evaluation in beef cattle, we examined the strengths and weaknesses at each university and set out to do just that. The Animal Breeding Group at Cornell University had invested heavily in the hardware and personnel to create databases. The University of Georgia has the largest investment in personnel with expertise to run genetic evaluations, and Colorado State University has the expertise to develop and deliver decision-support tools. Our model to develop multibreed genetic evaluations has evolved to capitalize on these strengths, with each university bringing a different component to the table.

At Cornell, we are building the national pedigree file that will allow us to identify the same animal accurately across registries. With disparate databases, animals can be registered with several associations. Breed associations were faced with the problem of identifying animals in their database that were registered seedstock from other associations. This has led to multiple solutions, and our current effort in developing the national pedigree file is to sort