

FROM RESEARCH TO APPLICATION: A MODEL FOR EDUCATING BEEF PRODUCERS IN ANIMAL BREEDING TECHNOLOGIES

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INTRODUCTION

Advances in genetic technologies have provided animal production industries with ever increasing information. This information comes in the form of genetic evaluations and molecular technologies. The scientific and private industry communities have done a tremendous job of getting this information in the hands of producers with scant advice on how to use it for better breeding decisions. The National Beef Cattle Evaluation Consortium (NBCEC) has implemented an educational program directed at improving breeding management decisions in beef operations.

Since the publication of the first genetic evaluation in the United States (American Simmental Association, 1971) the number of breeds to provide genetic evaluations in the form of Expected Progeny Differences (EPD) and the number of traits evaluated has increased dramatically. There are currently at least 23 US breeds being evaluated. The American Angus Association is computing 22 genetic values in the form of EPD or index values (American Angus Association, 2006) with other breeds reporting similar numbers. There is a plethora of information that is very difficult to assimilate into any kind of cohesive breeding plan. Compounding the confusion, producers now have the opportunity to utilize marker assisted selection. How does marker data fit in and assist beef producers in becoming more profitable?

Molecular genetic information is being incorporated into Animal Breeding courses worldwide (Detilleux and Leroy, 2002; Oltenacu, 2002), but this does not benefit the majority of beef producers that need this understanding now. The NBCEC was formed in 2001 to streamline and coordinate genetic evaluations of beef cattle in the US. The NBCEC realized that simply providing industry with more and better genetic evaluations was not going to necessarily improve the sustainability of beef producers. An educational component was developed to deliver the material provided by NBCEC to producers. The educational group of NBCEC developed an educational model to efficiently utilize limited resources in an effort to educate beef producers in the US. This model incorporated a strategy to train professionals that have the opportunity to educate producers, develop educational materials, direct education of producers and develop relationships with beef producers that will enhance the research opportunities of the NBCEC.

TRAIN-THE-TRAINER

It would be impossible for a small group of educators to directly reach a high percentage of beef producers because of the vastness of the US beef industry, having approximately 775,000 beef cattle producers and 33.25 million cows (NASS, 2006). The best approach to achieve broad impact would be to utilize current producer education structures. The first is the

Cooperative Extension Service (CES), funded by federal and state monies to educate communities on all aspects of agriculture. The structure includes state specialists in various areas of expertise (e.g. beef cattle) that serves as a resource for area educators within the state. These area educators typically have responsibility for educating the population on a broad array of topics (e.g. beef cattle, dairy cattle, swine, agronomy, horticulture, etc.). Many of the area educators would have had little or no education in animal breeding and may have very limited knowledge in beef cattle production.

Another group of potential educators are breed association and AI industry representatives and sales personnel. This group consists of professionals that are very dedicated, and usually trained, in beef production. However, the level of understanding of the fundamentals of animal breeding and of molecular technologies would be varied.

The primary goal of the NBCEC educational program is to elevate the level of understanding, and provide teaching resources, of educators of beef producers on current genetic technologies. To reach a national audience with a limited budget it was decided to offer these trainings to CES, breed association, and AI industry representatives through internet technologies. The format used was the TeleNet Conferencing System offered through the University of Illinois. This system has video transmission via the internet and audio transmission via a telephone conference call. All participants and speakers can access the program from their own office, with no travel expenses.

Three educational series have been delivered utilizing these technologies. For each series the basic format was one hour of training each week on a different topic. The series that have been conducted include: Beef Genetics – Molecular to Management (seven sessions); Beef Cattle Genetics – Fine Tuning Selection Decisions (three sessions); and Crossbreeding – Opportunities for the US Beef Industry (seven sessions). Each session was delivered by one or two leading experts, usually a scientist directly involved with research in that topic area. Participants represented 35 states and one Canadian province and were made up of teaching faculty, Extension specialists, graduate students, area Extension educators, breed association and AI company representatives.

Surveys were administered to determine if this training was effective in supporting education professionals in their programming and instruction. Survey results from the first training indicated that 41% planned to use the presentations to deliver educational programs to producers, 74% planned to develop their own slides from the material for producer educational programs, 32% planned to use the material to teach undergraduate courses and 68% planned to use the information for consulting clientele (Bullock *et al.*, 2003). Similar results were observed in the most recent training survey.

EDUCATIONAL MATERIALS

Supporting materials include slide set presentations, spreadsheet templates and other software, written materials, and online resources. The source for providing slide presentations came directly from the online trainings previously discussed. Slide presentations and any other software used in the trainings were made available to participants for their use. Additionally, CDs were developed from each series and distributed to educators through various venues and all materials were made available on the NBCEC website (www.nbcec.org). There are a total of seventeen slide set presentations available to educators for use in their programs.

Just as a text book is often needed in formal classroom education, written documentation is needed for producer education. Although there are many documents written on various genetic topics, intended for use by beef producers, there is not a single comprehensive

document that covers the full spectrum of beef cattle breeding in a form that is palatable to beef producers. Therefore, a manual was developed to assist in educating beef producers on modern beef breeding technologies. The Sire Selection Manual includes the following chapters: The Importance of Sire Selection; Assessing Management, Resources and Marketing; Genetic Principles; Crossbreeding for Commercial Beef Production; Breed and Composite Selection; Data Collection and Interpretation; Expected Progeny Differences; Interpretation and Utilization of Expected Progeny Differences; Economically Relevant Traits; Selection Decisions: Tools for economic improvement beyond EPD; Visual and Phenotypic Evaluation of Bulls; DNA Based Technologies; and a Summary.

The NBCEC will not publish large quantities of the manuals. However, the materials will be available for states, breed associations or other organizations to publish. The objective is to provide the resource to as many producers as possible at minimal expense.

PRODUCER WORKSHOPS AND SYMPOSIA

In addition to training beef educators the educational group of NBCEC felt it was necessary to have limited but direct educational contact with beef producers. This has been accomplished through workshops and symposia at various venues. Interactive workshops were developed to walk producers through the step-by-step process of sire selection. This process involves analyzing the environmental and management limitations and opportunities of the operation, defining marketing goals, determining the immediate and long-term breeding objectives, and final selection of the sire that will best fit those needs. These workshops have been conducted at the National Cattlemen's Beef Association's Cattleman College and various State cattlemen's association conventions.

Direct contact with producers serves as a two-way exchange of information. Not only are the producers educated on a particular topic, but they also provide useful information back to educators that can be incorporated into future education or research objectives. Two workshop/symposia were developed to take advantage of these opportunities: Beef Cattle Adaptability; and Beef Cattle Feed Efficiency. In the case of beef cattle adaptability, a small group of researchers, educators, and producers met in an informal setting and fleshed out the challenges and opportunities that were apparent in this area. From this meeting a workshop was developed to address these issues (<http://www.ctorque.com/ANSCI/adaptability.html>). A larger group of researchers, educators, and producers were involved in this workshop with the goal of defining the objective and developing a plan of action. The goal that arose from this workshop was to investigate the possibility of developing a genetic evaluation for adaptability in beef cattle. The initial plan of action was to launch a pilot project with one of the ranches involved in the workshop and report those findings along with any other pertinent information at a national symposium. There was widespread interest in the symposium and information generated from the pilot project warranted further investigation. Based on this series of workshops and symposium research is underway to develop evaluations for adaptability.

REFERENCES

- American Angus Association Sire Summary (2006).
- Bullock, K. D., Strohbehm, D. R., Pollak, E. J., Golden, B. L., Bertrand, J. K. and Wilson, D. E. (2003) *J. Anim. Sci.* **Vol 81 Suppl 1**.
- Detilleux, J. and Leroy, P. L. (2002) *Proc. 7th WCGALP* **29-01**.
- National Agricultural Statistics Service (NASS) (2006)
http://www.nass.usda.gov/Charts_and_Maps/Cattle/index.asp.
- Oltenacu, P. A. (2002) *Proc. 7th WCGALP* **29-02**.
- Simmental Sire Summary (1971).