by Jack Ward, chief operating officer and director of breed improvement

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Genomics: A Hereford Update

Over the past few months, it has been brought to my attention that there are a lot of questions in the minds of Hereford breeders concerning the area of genomics. With all of these questions prevailing, I think it is important to update the membership on how the American Hereford Association (AHA) has positioned itself to incorporate this new technology. First of all, I want to remind breeders that the AHA fully endorses the technology and has utilized DNA for parentage verification and genetic abnormality testing. Other than these uses, I would like to give a brief rundown on what the AHA has done to keep its fingers on this pulse of DNA testing.

The AHA and its membership were instrumental in the mapping of the bovine genome from its conception. If you remember, the original animal used was the Miles City L1 cow. In addition, Hereford breeders throughout the U.S. provide DNA and financial support to this project.

Second, many of our members provided DNA for the research and discovery of markers for the three known genetic abnormalities within the Hereford breed. Because of the work of Jon Beever, University of Illinois animal geneticist, and the Hereford membership, we have been able to add these markers to our parent verification panel with no additional cost to breeders.

The significance of this research has been the ability to test animals and market or purchase them with confidence that they are free of any abnormalities. This is useful to the purebred sector, but it has been instrumental in the commercial sector as your customers can find the bulls that they need to be profitable without being concerned about genetic abnormalities.

Next, the U.S. Meat Animal Research Center (USMARC) put together a project that would develop 50,000 (50K) genotypes on 2,000 beef bulls from various breeds. The AHA and its members supplied semen and information on nearly 500 Hereford sires (these included the carcass merit project sires).

The intent of this project was to develop a population from each breed that could be used to effectively train or validate markers that would be developed for genetic improvement. In addition, this project was intended to evaluate the proper ways to add genomics into a breed's genetic analysis.

This project has been interesting, as it has shown 50K panels might not have high enough density. For sure it will not have enough density to be used across breeds, but it may have enough density to make some predictions within a breed. In addition to these 50K genotypes, the AHA, through various other projects, has access to other sires with 50K genotypes to bring the total number to nearly 800 head. With this total number of genotypes, we have provided different entities the 50K genotypes, pedigree and performance information in order to validate existing panels that are being marketed. In addition, we have shared this information with researchers to look at training a panel for all measurable traits in the Hereford breed.

Finally, the AHA and some of its members have worked with the National Beef Cattle Evaluation Consortium on the weight trait project. This project was developed to see if there could be a panel of markers put together across breeds to predict weaning weight.

This project is in its beginning, but after the first year, it did not show much value. It actually showed about the same amount of value of a pedigree estimate and that was on a trait that is .20 heritable in the Hereford breed. Some changes and additions have been made for the second phase of this project, which could show much better results in future years.

So, what do Hereford breeders need to conclude? First, recognize that the AHA has been a very active participant in the development of genetic markers. Second, please be aware of any tests that are being marketed outside the AHA today.

The AHA and its members have used a lot of resources to develop a population to validate the value of markers, and to this point we have not seen any tests that show enough variation of any trait with the exception of tenderness. If you are interested in adding tenderness to your herd, then these tests will have value.

Second, the real value in the future of these tests will be to evaluate animals for traits that are hard to collect phenotypes. Those would include efficiency, fertility and other economically relevant traits (ERT) that can really affect profitability for you and your customers.

So, I want to leave you with this take-home message. As I write this article, we have not introduced genomics into the Hereford analysis because we do not have anything that has been validated to the Hereford population besides tenderness.

The AHA Board still believes that proper training and validation should be done in order for us to add this data to the evaluation. The AHA has been actively working with researchers and entities to find a panel specific to Hereford that could add accuracy and value to the genetic analysis. We will continue to use DNA marker technology to validate parents and test for genetic abnormalities.

What can you do to help with this research? At the moment, we have been asked to put together at least another 100 sires with 50K panels. The cost of running these on each sire is a straw of semen and $150. If you are interested in participating or have any questions or concerns about genomics, please contact me at 816-842-3757 or jward@hereford.org.

By the time you read this article, there may have been some research that has put together a panel that has been properly identified and validated to the Hereford population, and it will be data that we can use in the genetic analysis. When this happens, rest assured that the AHA will be sending you the message and working with the proper entities to get this information added to the analysis. **HW**

Collect feed efficiency data at Olsens'

Art and Douglas Olsen are looking for cattle to test for feed efficiency at their state-of-the-art facility with new GrowSafe system at Harrisburg, Neb. Bulls, steers or replacement heifers can be tested. Olsens can also collect ultrasound data and artificially inseminate heifers.

The GrowSafe equipment is being used to test National Reference Sire Program (NRSP) cattle. Currently 196 NRSP calves are on test.

Stop by the ranch or give Art or Douglas a call to discuss the opportunities to test your cattle. Call 308-673-5597 or e-mail artolsen@daltontel.net. **HW**

Research in Crossbreeding Leads to Start of Hereford Program at Chico State

Dave Daley, California State University (CSU), Chico, associate dean and University farm administrator, conducted a three-year crossbreeding study and found an economic advantage to using Hereford bulls over Angus bulls in a predominately straight-bred Angus cow herd. Results of the study have generated significant national interest in establishing crossbreeding programs.

The research, funded by the Agricultural Research Initiative, the American Hereford Association, Lacey Livestock, Harris Ranch Feeding Co. and Harris Ranch Beef Co., found improvements in feed efficiency, animal health and net economic return. As a result of the study, the American Hereford Association and other breeders donated cattle and embryos to help launch a Hereford program at CSU, Chico.

"The breeding program offers one more area of field experience for students," says Daley, "and gives students the opportunity to interact with an additional segment of industry professionals."

The three-year study was conducted as a "field trial" under real world range conditions on ranches in central and eastern California. Angus cows were mated to both Hereford and Angus bulls under typical Western range conditions. The hypothesis of the study was that there would be an economic advantage to crossbreeding, especially in the finishing phase.

Angus cattle have been effectively marketed to the consumer for such things as quality grade (marbling) and tenderness. Crossbred animals, however, are generally expected to exhibit hybrid vigor resulting in advantages in traits like longevity, health and reproductive fitness — which directly impact net profitability to the producer.

For more information about the study, visit *Hereford.org*. **HW**