by **Craig Huffhines**, *executive vice president*

*chuffhin@hereford.org*

# The Miracle of Computers

Craig Huffhines

Last November, I traded my older vehicle for a 2012 Ford F-150 pickup. I have a very good friend who is a line foreman for Ford Motor Co. who was telling me about the latest technological advances in engine efficiency and electronic capability.

Being loyal to an American car company and my good friend, I bought the pickup with anxious anticipation of experiencing the new bells and whistles he had promised. My review: the ride is awesome, it is a six cylinder that has more power than my previous V8s ever had, and the dashboard capabilities blow me away.

What I'm talking about are the electronics of the vehicle. I have an iPhone that will synch with the radio, and now I have a rolling office where I can make and take calls from the steering wheel.

The point to all of this sales pitch on my new Ford that I'm so proud of is this — engineering advances have created amazing change in our creature comforts, our communication with one another, our home electronics and virtually every aspect of our culture. These advances are some of the same technology that is beginning to change the amount and accuracy of information that will virtually allow you as a Hereford breeder to double the rate of change through accurate decision making in your breeding program.

August 2012 marked a milestone for the Hereford breed when the American Hereford Association (AHA) launched its very first genomic-enhanced expected progeny differences (GE-EPDs). Utilizing amazing technology that reads genetic code and an ever expanding computing capacity has enabled the seedstock industry to conduct ongoing research to discover the combination of genetic codings within the genome of individual animals that are determined to impact their biological performance and more accurately define their genetic value at an early age.

Most of this life-altering technology and scientific breakthrough started in the 1950s with the invention of the integrated circuit. The integrated circuit is a series of transistors and electronics built on microscopic semiconductor material that can be used to process and store information. I think we would all be shocked at how much of our lives are influenced by these tiny miracles of technology including our fresh drinking water, every aspect of our transportation systems, farming equipment and the food chain.

Gordon Moore, the co-founder of Intel, wrote a research paper in the 1960s with a proof that still holds true today — over the history of computing hardware, the number of transistors on a 1-inch integrated circuit doubles every two years, impacting processing speed, memory capacity and even the size of pixels in digital cameras. Moore's truth has enabled production agriculture to develop decision technology that has impacted crop genetics and precision farming technology and is having more of an influence in the accuracy of selection decisions in young Hereford sires.

In mid-April, the AHA released updated GE-EPDs (see "Performance Matters," Page 8).

We want to thank all of you early adopters, who have invested with the AHA in the genotyping of several thousand animals — it has had an enormous impact on discovery. I also want to remind you that although research in this field of animal genomics has been intense the last 20 years, the computing power and DNA sequencing technology have just recently gotten to a point where we can really start to make sense of this information.

There will always be continuous improvement just as Ford continues to re-engineer its award-winning trucks. We obviously do not have all of the answers and some of our findings we question daily. However, there is one thing we can all be confident in: Moore's law will continue to prevail.

Our collaborative effort with the brightest scientific minds in production agriculture will help us to continue making amazing discoveries in genetic information, and your continued commitment will allow us to have the phenotypic information that will help the AHA build upon this amazing technology. **HW**

## 2013 BIF Symposium scheduled

Oklahoma State University (OSU), in collaboration with the Beef Improvement Federation (BIF), will host the 45th Annual BIF Research Symposium and Meeting June 12-15 at the Renaissance Hotel and Convention Center in Oklahoma City.

A complete schedule and links to online registration are available at *BIFconference.com*. **HW**