



## What is the HD50K for Angus?

DNA technology in livestock has evolved dramatically in recent times as shown by the release in April 2010 of Pfizer Animal Genetics' first commercial DNA test using a high-density panel with more than 50,000 DNA markers for quantitative traits in black Angus cattle. Molecular Value Predictions (MVPs) are breeding values that predict the genetic potential of an animal based solely on its DNA. The HD 50K for Angus provides MVPs for 16 economically important traits including:

- **Calving:** (Calving Ease Direct<sup>#</sup>, Calving Ease Daughters<sup>#</sup>, Birth Weight<sup>#</sup>)
- **Fertility:** (Scrotal Size\*)
- **Growth:** (Weaning Weight<sup>#</sup>, Milk<sup>#</sup>, Yearling Weight\*, Mature Cow Weight\*)
- **Feedlot:** (Dry Matter Intake<sup>‡</sup>, Feedlot Daily Gain<sup>‡</sup>, Net Feed Intake<sup>‡</sup>)
- **Carcase:** (Carcase Weight<sup>#</sup>, Rib Fat<sup>#</sup>, Eye Muscle Area<sup>#</sup>, Marbling<sup>#</sup>, Tenderness<sup>‡</sup>)

**(# traits included in the BREEDPLAN analysis; \*traits soon to be included; ‡ traits outside of BREEDPLAN)**

As part of the monthly Angus Group BREEDPLAN run, breeders and bull buyers alike are getting a suite of the most advanced selection tools available for any breed anywhere in the world. The addition, since April 2011, of Pfizer's Molecular Value Predictions (MVPs) for 11 traits to the calculation of Angus Group BREEDPLAN EBVs has revolutionized the way that young animals can be selected increasing the rate of genetic gain for the Angus breed in Australia.

## How was the HD50K for Angus developed and validated?

The HD50K for Angus prediction equations were initially developed and validated in a data set with 5,100 genotyped Angus animals with phenotypes and genetic evaluation available for the traits offered. In addition, a significant number of Australian and New Zealand born high accuracy sires were then used to further calibrate these prediction equations. A proprietary strategy, developed by Pfizer Animal Genetics and reviewed by external scientific experts, was used to simultaneously develop the prediction equations for the HD50K for Angus and cross-validate on unrelated subsets of animals. Additionally, a further validation population was put together from a combination of high accuracy sires used in Australia and New Zealand. The MVPs were also supplied to AGBU (Animal Genetics and Breeding Unit) for an independent validation utilising extensive phenotypic data from these animals and their contemporaries and progeny.

## Key Applications of the HD50K for Angus

### **Hard to measure traits**

Many of the economically important traits are very difficult and expensive to measure. In addition, many of these traits are not part of the BREEDPLAN genetic evaluation system. HD50K for Angus can provide detailed information on the genetic worth of an individual for these key traits and can provide that information shortly after birth.

- Net Feed Intake (NFI) is an increasingly important trait in today's beef industry. With feed being the number one expenditure in any beef cattle operation, and price of feed raising at an astonishing rate, the efficient use of this resource becomes more and more relevant in today's beef industry.
- Tenderness has been ranked the most important contributing factor to eating quality by consumers. This trait can only be recorded once an animal has been slaughtered and this DNA test provides us with an objective indication of the genetic merit of an animal on this trait.
- Maternal traits: To obtain high levels of accuracy for this group of traits, it will take several generations of recording. DNA came to the rescue and now allows us to obtain accurate information for these traits very early in life.

## **Replacement Animals**

Replacement animals represent the future of the genetics of a herd, therefore to ensure the best possible selection decision are being made while selecting these animals, HD50K for Angus plays a very important role.

- **Replacement Heifers:** There is little information available on the genetic merit of potential replacement heifers. As they haven't had a calf of their own yet, the only data available to predict their genetic merit is based on mid parent value information at best. The HD50K for Angus can provide a comprehensive picture of a candidate replacement heifers' genetic potential.
- **Donor Dams:** Currently the way donor dams are selected, means that they are mature cows before enough is known about them to make a confident selection decision. By doing this, the generation interval of the entire herd increases, reducing the genetic improvement that could be achieved if heifers were selected as donors. The HD50K for Angus can provide the necessary information on young heifers and allow us to select them as donors with confidence.
- **Yearling/Herd Bulls:** Selecting bulls as yearlings, for sale, own use, progeny testing, specific use (i.e. heifer bulls), is a mighty challenge as the information available at this point in their lives is restricted. The HD50K for Angus provides accurate information for economically important traits that will assist in this very crucial task to ensure the genetic improvement of a herd.