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North America

Welcome to Pfizer Animal Genetics

Pfizer Animal Health is deeply rooted in maximizing producer profitability and effective decision-making through sound management tools resulting in healthy, productive animals. Last spring the acquisition of two genetic companies, Bovigen and Catapult Genetics, furthered its commitment to providing customers with the best technology and knowledge to make more-informed business decisions with both the animal and profit in mind. Thus Pfizer Animal Genetics, a business unit of Pfizer Animal Health, was born.

Since the establishment of Pfizer Animal Genetics we've often been asked, "Why is Pfizer Animal Health entering the genetics business?" Simply put, Pfizer Animal Genetics will be used as a new component of our integrated approach to animal management. As a company we're dedicated to providing our customers with all of the tools necessary to maximize production and profitability. Pfizer Animal Genetics will provide a new technology—DNA-markers—to help beef producers weave data, genetics and health management together to advance their decision-making capabilities.

Where we are today

While we are new participants in this field of emerging technology, Pfizer Animal Genetics is dedicated to gaining the trust and respect of our

industry partners through diligence and hard work, with the goal of being the global leader in animal genomics. Pfizer Animal Genetics inherited a skilled team of researchers, including Dr. Gerard Davis, a co-founder of Catapult Genetics, and is continuing to add key personnel. One example is Dr. Ronnie Green, a highly respected and noted animal genetics and genomics researcher and thought leader. The experience and knowledge of our staff will prove to be a valuable asset to livestock producers as we establish our leadership in DNA-marker research, validation and test offerings.

With the purchase of Bovigen, LLC and Catapult Genetics, we've entered the business with a line of DNA-markers for use by seedstock producers and commercial cattle operations to identify genetically superior beef cattle. The DNA tests we currently offer include:

- GeneSTAR® Tenderness—a diagnostic tool for determining genetic differences in meat tenderness
- GeneSTAR Feed Efficiency—indicates an animal's genetic ability to efficiently convert feed to protein
- GeneSTAR Quality Grade—identifies genes associated with quality grade and marbling

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Producer Profile



Informed decision-making focused on genetics is the basis of Tommy Donnell's seedstock business. By integrating GeneSTAR®

technology, Tommy is learning more about his cattle, resulting in precise mating decisions, additional profits and enhanced marketing opportunities. Read more inside.

From the Expert

DR. RONNIE GREEN
PFIZER ANIMAL GENETICS



What is the greatest advantage producers can realize from using genetic marker technology?

DNA-marker technology is a tool to help producers make more precise breeding and management decisions. DNA-marker tests can help identify genetically superior animals, often earlier than progeny testing. We are now entering an era where on-farm precision management, employing genetic information, can influence how we optimize animal productivity. Beginning with DNA-marker testing and phenotypic data, better decisions can be made about herd genetics, feeding programs, optimal animal harvest and, in the future, more traits that involve animal health and beef quality.

The science behind genetics and genomics

As any beef producer knows, it takes a variety of sound management practices, attention to detail and successful genetics to produce high-quality beef. Producers often rely heavily on proven nutrition, good genetics and aggressive management to be profitable. Another emerging management tool, DNA-marker testing, is a powerful option to help producers fine-tune decision-making to produce and manage genetically superior animals.

GeneSTAR® DNA-marker testing for tenderness, quality grade and feed efficiency provides beef producers with additional information on individual animals to enhance their growing and finishing operations. Producers who utilize these technologies can produce a higher-value product and receive a premium price for improved tenderness and marbling, leading to enhanced profitability.

Animals found to possess favorable genes for tenderness, marbling or feed efficiency can be managed to optimize these traits.

Basics of genetic marker technology

The specific science behind genetic markers is as complex as the DNA that it identifies, but with a little background, producers can better understand the powerful technology that helps identify key traits for enhanced beef quality and cattle management.

There are a few key terms that often arise when discussing genetic marker

testing which are critical to understand when focusing on genomics:

- **DNA-marker:** A specific DNA variation associated with a particular characteristic.
- **Alleles:** Variations of a particular DNA-marker that are inherited from parents.
- **DNA-marker testing (genotyping):** Determines which alleles an animal has.
- **Single Nucleotide Polymorphism (SNP – pronounced “snip”):** A single letter change in a DNA sequence, resulting in genotypic or phenotypic variety.
- **Phenotype:** The expressed traits that can be observed and measured.
- **Genotype:** The genetic makeup which is not able to be seen.

By performing DNA-marker testing, producers can identify which traits an animal possesses that may impact carcass quality and the rate of efficient gain. Animals found to possess favorable genes for tenderness, marbling or feed efficiency can be managed to optimize these traits.

Better management with genetic marker information

GeneSTAR genotyping identifies permanent, heritable traits in cattle at a young age. By performing DNA-marker testing on an animal, producers can identify the animal’s potential for key traits.

The expression of each trait is influenced by a number of external and internal factors. The heritability of a trait determines how easily it is influenced by external factors. Traits such as female fertility have low heritability and are

largely influenced by nutrition and management, while traits such as marbling are easier to influence through genetic selection due to higher heritability.

The ability to identify economically significant traits will continue to improve as researchers rapidly expand the number of markers that can be tested, and gain a better understanding of the potential genetic impact. Management factors will continue to be influential in the expression of traits, as even highly heritable traits are impacted by management of cattle pre- and postmortem. Tenderness markers, for example, identify the presence of two enzymes, Calpain and Calpastatin, which indicate the animal’s potential for carcass quality. The amount of tenderness expressed, however, is impacted by the animal’s environment, (i.e., nutrition, management and environmental conditions), throughout its lifetime and harvest.

Test results on tenderness, marbling and feed efficiency offer additional information beyond traditional decision-making tools for cattle management. Their use makes strides toward maximizing the profitability of beef production, and helps to move the industry in the direction of consistent quality products and improved consumer consumption, resulting in higher profits for producers.



Putting genomics into action: what it means to your operation

EPDs, DMI, RFI, CMP, NFI, IMF ... with all of the input variables affecting the management of beef cattle, it's easy to feel overwhelmed. Producers have a wide variety of industry standards to consider when making management decisions, each of which can provide value in an operation when applied correctly. New technology in the form of DNA-markers can add another valuable tool to consider: DNA.

The science behind high-quality beef

Current GeneSTAR® DNA-marker tests are available to identify important traits in beef cattle. Each of the marker tests offers an opportunity for producers to make more precise management and selection decisions, resulting in improved profitability. Some of the tests currently available to producers include:

GeneSTAR Tenderness—a DNA-marker test for Calpastatin and Calpain, two genes which influence the postmortem tenderization process of beef and identify animals that are more likely to produce tender beef cuts. The synchronized activity of these naturally occurring, highly heritable enzymes determines the palatability potential of beef by impacting the postmortem breakdown of muscle fibers. Together, they have a large effect on the shear-force tenderness rating of beef products.

The GeneSTAR Quality Grade—four-marker test panel. Multiple evaluations across numerous breeds of cattle indicate that each of the four gene markers in the panel is highly associated with quality grade.

GeneSTAR Tenderness and GeneSTAR Quality Grade test results identify the potential for an individual animal to have better carcass quality. While the results from genetic tests are simple to comprehend, how you incorporate

them into your genetic selection criteria depends on your herd goals.

GeneSTAR Feed Efficiency—identifies animals with greater potential to optimize feed intake into growth, giving producers a leg up on more precise management.

GeneSTAR Feed Efficiency DNA-markers can identify as much as a 15 percent difference in daily feed consumption. By testing cattle for their feed efficiency potential, producers can group animals based on their ability to convert feed to growth, and manage them more profitably than feeding them the same as cattle with lower feed efficiency potential.

When combined with other ratings, such as EPDs, DNA-marker results are especially valuable.

Gaining an industry advantage with DNA testing

DNA-marker information offers the opportunity for producers to enhance genetic improvement programs and make the most of other industry standard scores. When combined with other ratings, such as EPDs, DNA-marker results are especially valuable.

A producer gains additional valuable insight into the sire's genotype when results are available from DNA-marker



testing. For example, sires can be selected by their EPDs and traditional phenotype selection methods, then ranked by their genotypic potential for specific traits identified by DNA-markers. After further sorting by other phenotype indicators, the resulting group of sires will best fit the needs of the herd.

DNA-marker testing is also a valuable tool for identifying genetically superior females that can best contribute to the genetic progress of the herd. The potential impact of a cow family can be evaluated through DNA-marker testing, and females with the best combination of visible characteristics and genetic traits can be selected as embryo donors and replacement brood cows, allowing producers to maximize the use of both phenotypic and genotypic information.

With a focus on future genetic improvements and an organized analytical approach combining phenotypic information with the GeneSTAR DNA-marker test results, producers now have the ability to jump-start positive changes in their herd by making economically relevant improvements. This precision management will help to transform the industry and help it enjoy a stronger demand and price for higher-quality beef.



Welcome to Pfizer Animal Genetics

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- SureTRAK®—accurately traces a carcass or cut of meat back to the source animal
- SireTRACE®—identifies parentage and verifies animal identity

We are committed to accelerating research and development relating to new markers and traits, with a special focus on meat quality, feed efficiency and health. As the newest technology becomes available, DNA-markers will help producers make improved and more targeted breeding decisions, set appropriate harvest dates and maximize profits. These decisions will ultimately influence our end-users, consumers, and provide them with the product they demand: consistently high-quality, tender and flavorful beef on the dinner table.

Currently, we are working to enhance the DNA-marker technology to its maximum potential, while maintaining focus on economics and usefulness on the farm. Our ultimate goal is for producers to quickly receive DNA test results in order to make effective management decisions to maximize profitability and animal productivity, and ensure the best quality product.

Our commitment to the industry

Pfizer Animal Genetics aims to fund quality genomics research on a global scale and to develop products using a world-class team of scientists. We also intend to invest in educational and bio-informatics initiatives to ensure the significant benefits of genomics technology are translated into valuable breeding and management solutions for our customers.

Just as our parent company has dedicated itself to extensive research and development, Pfizer Animal Genetics is committed to providing the same to our producer clients. We believe that a tremendous potential lies locked within DNA, and our focus is to unlock this opportunity to develop relevant solutions for use by seedstock and commercial beef producers.

For the latest news and updates on our research and development partnerships in cattle and sheep, please refer to our Web site, www.pfizeranimalgenetics.com.