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North America

## Pfizer Animal Genetics Releases an Expanded DNA-marker Panel

DNA-marker technology continues to evolve at breakneck speed, and the latest advance is a more reliable genetic test for beef producers who are looking to make more informed management decisions. Pfizer Animal Genetics recently released GeneSTAR® Molecular Value Predictions (MVPs®), based on an expanded panel of 56 DNA markers, that identify traits for feed efficiency, marbling and tenderness and improve the reliability and value of GeneSTAR as a decision-making tool.

GeneSTAR MVP technology provides:

- A measure of molecular breeding value expressed in units of the trait, similar to expected progeny differences (EPDs).
- Average MVP reliability values for the herd.
- A state-of-the-art molecular tool which, when combined with traditional genetic principles, can promote accelerated rates of genetic improvement.

GeneSTAR MVPs are a result of Pfizer Animal Genetics' significant investment in research, development and third-party validation of new genomic technologies in cattle.

"As new discoveries in molecular genetics become available, beef producers must be able to trust that these innovations will benefit their operations," says Pfizer Animal Genetics Senior Director of Global Technical Services Dr. Ronnie Green. "For this reason, it is crucial that each new technology is rigorously and independently validated."

### DNA-marker Technology Validation

The process from discovery to validation includes four steps:

- 1) Discovery. Markers, or panels of markers, are identified that are significantly correlated with expression of a commercially relevant trait in one or more accurately phenotyped cattle populations. These panels are developed from a variety of sources and combine markers and detailed predictions across multiple cattle groups.
- 2) Development of statistical methodology for calculating MVPs from the marker panels.
- 3) Internal evaluation and validation. Once a marker panel for a trait is identified, it is evaluated in populations that were not included in the discovery cattle groups.

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- Understanding the New GeneSTAR Reporting System
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### Producer Profile



Selecting high-end Angus at the top of the breeding population summarizes the breeding program at Vintage Angus Ranch.

Learn how Doug Worthington is improving his ranch's breeding program using GeneSTAR information. Read more inside.

### From the Expert

DR. RONNIE GREEN  
PFIZER ANIMAL GENETICS



### What are GeneSTAR MVPs?

GeneSTAR MVPs are by definition a "molecular breeding value" based on the effects of the specific markers in the current panel. Thus, they represent a portion of the expected underlying genes affecting the traits. By definition, an MVP is similar to an expected progeny difference (EPD) from a genetic evaluation in how it is expressed. The difference is that an EPD is based on phenotypic records of the animal and its relatives, whereas an MVP is derived from an animal's genotype only.

## Understanding the New GeneSTAR Reporting System


The release of GeneSTAR® MVP™ makes available more genetic information than ever before about economically relevant traits. In order to provide beef producers with the best representation of the true genetic value of an individual animal, this new system has been developed to deliver more relevant and reliable information about an animal's genetic potential.

### Understanding the new report

GeneSTAR results were previously reported as a number of stars based on the total number of favorable alleles—or alternate forms of a gene—affecting the trait, with a maximum of eight stars per trait. GeneSTAR MVPs are based on many more markers, which do not necessarily have equal effects, and that may affect more than one trait simultaneously. When moving to a larger number of markers, the more appropriate method to capture the greatest value from DNA testing is to move to an MVP format. GeneSTAR MVPs are produced for each trait to appropriately account for the sum total of the marker effects on that trait.

New GeneSTAR MVPs account for a 56 DNA-marker panel which includes the previous 11 and an additional 45 newly identified markers. MVPs are produced for feed efficiency, marbling and tenderness.

A single MVP is calculated on each animal and is expressed in units of the trait. Also provided is a reliability value, which is the standard for assessing the accuracy and predictive power of the MVP for a trait. Reliability is based on the correlation between the MVP and the animal's genetic breeding value if all information were known.

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**GENESTAR CUSTOMER JOB RESULTS  
FINAL REPORT**

<b>Job Number:</b>	12345	<b>Customer ID:</b>	BovineCattle
<b>Date Requested:</b>	11/12/2007	<b>Password:</b>	sstocker
<b>Customer name:</b>	Bovine Cattle Company	<b>Contact:</b>	Sammy Stocker
<b>Customer phone:</b>	555-555-5555	<b>Customer fax:</b>	555-555-5556
<b>Customer address:</b>	123 Anywhere St Yourtown USA 12345		

**Molecular Value Prediction**

	FE	Marb	Tend	
Name: Amazing Bull Wonder 1536      Ear Tag:	MVP	-0.13	-0.25	-0.45
Barcode: 752 000040922684      Breed: Angus	% Rank	20%	90%	10%
An. ID: B202      Publish to Website: <input type="checkbox"/>				
Gender: M      Reg #:				

The reliability value is expressed as a percentage of the maximum accuracy attainable and is a useful indication of how much additional information may be added in the future as greater numbers of markers are added to the panels used to calculate the MVP.

The GeneSTAR MVP produces more information on an individual animal than the previous GeneSTAR test.

Producers will receive individual animal GeneSTAR MVP information in a format similar to the example shown. In addition, overall breed distribution, average herd reliability values and individual animal percentile rankings are also reported.

### Applying the new GeneSTAR information

As a full-service genomics provider, Pfizer Animal Genetics offers consultative technical services to ensure that maximal value can be achieved from the application of results in your production-marketing

system. This includes working with you to understand and apply the test information results to your own management and marketing programs.

An introductory offer enables producers to retest animals that have recently been tested under the previous "star" system. We began accepting samples for GeneSTAR MVP testing on February 19th. For specific questions regarding recently tested samples or any other inquiries relating to the new GeneSTAR MVP system, contact your local Pfizer Animal Genetics representative, call 1-877-BEEF DNA or go to [www.pfizeranimalgenetics.com](http://www.pfizeranimalgenetics.com).

## Putting GeneSTAR MVP to Work

### How the new panel can best benefit your operation

GeneSTAR® MVPs™ include more genetic markers than previous tests to deliver increased reliability, enabling producers to make management decisions with greater confidence. These decisions accelerate genetic progress and are the next era in incorporating DNA-marker technology for added value.

#### Stepping forward with MVP

According to Dorian Garrick, Iowa State University Professor of Animal Science and Jay Lush, Endowed Chair in Animal Breeding and Genetics, DNA-marker technology that enables selection at the molecular level—like GeneSTAR MVP—has the potential to transform the beef industry by advancing genetic improvement at a more rapid pace.

**“We have the opportunity to completely revolutionize the decision-making processes within a herd and the industry.”**  
**Dorrian Garrick**

“GeneSTAR MVP is a step forward in our genetic selection process, especially because it will provide producers with a numeric value they can use in concert with EPDs,” says Garrick. “In the past, producers have had to decide which data resource to emphasize more when making breeding decisions. This change will allow producers to account for, on a level playing field, the animal’s genetic profile as well as EPDs as they will both be communicated using the same language.”

#### Intensive bull selection

There are two groups to focus on when it comes to selecting bulls, says Garrick: 1) Seedstock herds that are choosing bulls for sire and replacement selection; and 2) commercial herds purchasing bulls from seedstock producers to be used as herd sires.

Garrick notes that for the seedstock producer, choosing bull fathers based on data with low accuracy puts the operation at risk—the range of phenotypic expression is greater either above or below the documented EPD.

“GeneSTAR MVPs are helping to take the risk out of producers’ decision-making through improved accuracy,” says Garrick. “This is a major advancement for both seedstock and commercial producers, and can result in accelerated genetic progress benefiting the entire beef industry.”

For the commercial herd, the advantage of using GeneSTAR MVP is that more is known about the animal being purchased for use as a herd sire. Garrick observes that “greater reliability will speed genetic improvement in seedstock herds, which will translate to the commercial producer as well.”

#### Heifer progress means profitability

Although many of the same selection theories apply to replacement females, a much larger fraction of females remain in the herd. “Even though the selection pressure is lower for females, producers will still see the benefit of improved accuracy,” says

Garrick. “With heifers we will reap the financial benefits of the bulls we select for economically relevant traits that we have not been able to measure in the past, like feed efficiency and tenderness.

“A rigorous validation process is the only thing that assures producers of the reliability of DNA-marker technology,” notes Garrick.

“Long-term, we have the opportunity to completely revolutionize the



decision-making processes within a herd and the industry by using tools like GeneSTAR MVPs that make predictions at the molecular level,” says Garrick. “Decisions will be more reliable because they are based on more accurate information that we can trust through third-party validation. These tools are taking some of the risk out of genetic selection, which can result in more direct progress and profits for the beef producer.”



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- 4) Third-party validation. In the U.S. the National Beef Cattle Evaluation Consortium (NBCEC) receives federal funding to act as a third-party agency validating DNA-marker technology.

More markers and increased reliability make GeneSTAR MVPs powerful tools for seedstock and commercial cow-calf operations, as well as feedlot operations. For cow-calf operators, GeneSTAR MVPs provide more genetic profile information to improve bull selection and improve the selection of replacement females. In feedlot systems, producers can sort animals into feeding regimens to more consistently and efficiently achieve end-product specifications. Additionally, tenderness and marbling MVPs have high values within supply chains seeking to differentiate product based on eating quality. Simply put, GeneSTAR MVPs enable precision animal management for seedstock and commercial beef producers.

## Pfizer Animal Genetics Unveils New Web Site

Our new Web site, [www.pfizeranimalgenetics.com](http://www.pfizeranimalgenetics.com), provides the latest information regarding animal genomics and genetic marker technology. New features include in-depth product information, an interactive sales and distributor map, and educational links to the latest information about DNA-marker technology. Visit the site today to learn more.

