

# STARS TO

# MVPs

## The New GeneSTAR Molecular Value Predictions (MVPs)

GeneSTAR® MVPs™ are a new era for genetic improvement in beef cattle. Now incorporating a 56-marker panel for core management traits<sup>1</sup>, GeneSTAR MVPs are the most powerful molecular selection tool available to date. The product provides Molecular Value Predictions for the traits of feed efficiency, marbling<sup>2</sup> and tenderness.

	
12 individual markers	56-marker panel
Number of STARS	Trait units for greater selection opportunity
Number of favourable alleles	Collective effects of markers contribute to trait prediction
Equal effects of each marker	Accounts for varying individual marker effects
No calculated reliability	% reliability described: 26–49%*
Not benchmarked against breed	Breed average and percentile ranks provided
Good selection tool	<b>A new era in genetic improvement</b>

\* Feed Efficiency: 30%, Marbling: 26%, Tenderness: 49%.

### What is a GeneSTAR Molecular Value Prediction (MVP)?

The GeneSTAR MVP is by definition a “molecular breeding value” based on the phenotypic effects of the specific markers in the panel. These markers represent a portion of the genes underlying traits of interest. By definition, an MVP is similar to an estimated breeding value (EBV) from a genetic evaluation in how it is expressed. The difference is that an EBV is based on phenotypic records of the animal and its relatives, whereas an MVP is derived from an animal’s genotype only.

### What is the difference between individual markers and a marker panel?

The previous GeneSTAR testing platform was comprised of highly sought after individual markers that had a large effect on a single trait. Conversely, a marker panel consists of markers having an effect on multiple traits simultaneously and accounts for how these markers interact. More markers mean a more comprehensive panel, contributing to enhanced genetic improvement through MVPs.

### How do GeneSTAR MVPs speed genetic improvement?

More markers and increased reliability add power to breeding decisions. This, combined with consultative services provided by Pfizer Animal Genetics, enables faster genetic improvement within herds.

### **Why are results reported in trait units instead of stars?**

With the introduction of the 56-marker panel, the star system has been revised. A single marker may affect multiple traits simultaneously; as a result, assigning a star number to that marker does not convey its complete value. The new MVP™ system is reported in trait units accounting for the simultaneous effect of all markers. The use of trait units allows for a real-world comparison of individual animals based on important production and quality characteristics.

### **How are the MVPs calculated and how are they different from a star number?**

The star system reported a result based on the number of favourable alleles present for a particular trait, with a maximum of eight stars for each of the three reported traits. MVPs incorporate information from many more markers, which may not all have equal effects and can simultaneously affect multiple traits. The MVP for a trait is predicted from the overall sum of allelic effects in the animal's genotype for the entire 56-marker panel for that specific trait.

### **This is the first time I have seen a reliability value on a GeneSTAR report summary. Where does this come from?**

Previous GeneSTAR® products did not report a reliability value as the result was simply the total number of favourable alleles present for a particular trait. The reliability

value 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.

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.

### **Is there any way to compare an animal's results with the rest of the breed?**

The new GeneSTAR MVP tool provides a full suite of breed-specific statistics. Each results report contains the breed averages, and maximum, minimum and percentile ranks for each of the core management traits reported. This allows for comparison of all animals both within the herd/management group and across the entire breed.

### **I know that validation is important. How have GeneSTAR MVPs been validated?**

GeneSTAR MVPs have been rigorously validated across extensive cattle populations. Aside from the extensive internal validation analyses conducted by Pfizer Animal Genetics, the product has also undergone transparent external validation by the National Beef Cattle Evaluation Consortium and CRC.

For more information please contact Pfizer Animal Genetics on 1300 768 400 or visit our Web site, [www.pfizeranimalgenetics.com.au](http://www.pfizeranimalgenetics.com.au).



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1 Pfizer Animal Genetics. GeneSTAR MVPs—Molecular Value Predictions for beef feed efficiency, marbling and tenderness. Technical Summary No. GST09001, New York, NY: Pfizer Animal Genetics, 2009:1-7.

2 The marbling MVP is significantly associated with Ultrasound as % IMF at 60 days prior to harvest.

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