



GeneNOTE 5



Independent US study confirms GeneSTAR® Marbling effects on Marbling Score and Quality Grade.

Introduction

The study objective was to conduct an independent evaluation of GeneSTAR® Marbling and also to provide a dataset for the development of new methods for incorporating gene marker results into EPDs for US National Cattle Evaluation programs.

Scientists from the National Beef Cattle Evaluation Consortium (NBCEC) conducted the study, with assistance from the American Simmental Association. The NBCEC comprises geneticists from Cornell University, Iowa State University, Colorado State University and the University of Georgia.

Background

Previous studies by Genetic Solutions have demonstrated a positive effect of GeneSTAR® Marbling in typical US yearling and calf-fed Angus and Angus cross cattle (see GeneNOTE 3). Animals with two copies (2-STAR) of the high marbling form (allele) of the gene had up to 10% higher marbling scores.

The proportion of yearling and calf-fed carcasses grading USDA Choice rather than Select also increased in absolute terms by 16-19% for 2-STAR animals compared to 0-STAR. Improvements for the 1-STAR animals were intermediate ranging from 4-7%.

Concurrently, the percentage of carcasses qualifying for CAB or Premium Choice category was doubled for 2-STAR carcasses versus 0-STAR.

Method

Animals for the study were chosen by NBCEC from the American Simmental Association research database. This database has been assembled over a number of years and includes animals from the NCBA Carcass Merit Project. Along with DNA samples, a comprehensive range of carcass and meat quality records is available on the animals.

The 549 Simmental-cross steers chosen for the study had records for marbling score and quality grade. They were the progeny of 49 Simmental sires.

GeneSTAR® Marbling results were collected for progeny of 11 of these sires which had been previously tested to be 1 or 2 STAR for GeneSTAR® Marbling. All GeneSTAR® Marbling testing was done by Genetic Solutions and results were forwarded to NBCEC.

Data were analysed using models that included sire (mixed model) or excluded sire (fixed). Results were similar for both models, particularly for Quality Grade.

Results

1. Effects of GeneSTAR® Marbling on USDA Marbling Score

Of the 277 steers genotyped for GeneSTAR® Marbling, 33 were 2-STAR, 162 were 1-STAR and 84 were 0-STAR.

The average marbling score for all steers was 520 points, consistent with the steers being fed to finish Low Choice.

Table 1. GeneSTAR® Marbling Effects on Marbling Score in Simmental-Cross Steers

GeneSTAR® Marbling Result	USDA Marbling Score (Fixed model)	USDA Marbling Score (Mixed model)
	530	527
	522	517
	516	516

Marbling Score was highest for 2-STAR steers and differed from 0-STAR steers by 11-14 points depending on statistical model. The 1-STAR steers




showed a 1-6 point gain compared to 0-STARS. The differences were not statistically significant.

2. Effects of GeneSTAR® Marbling on USDA Quality Grade

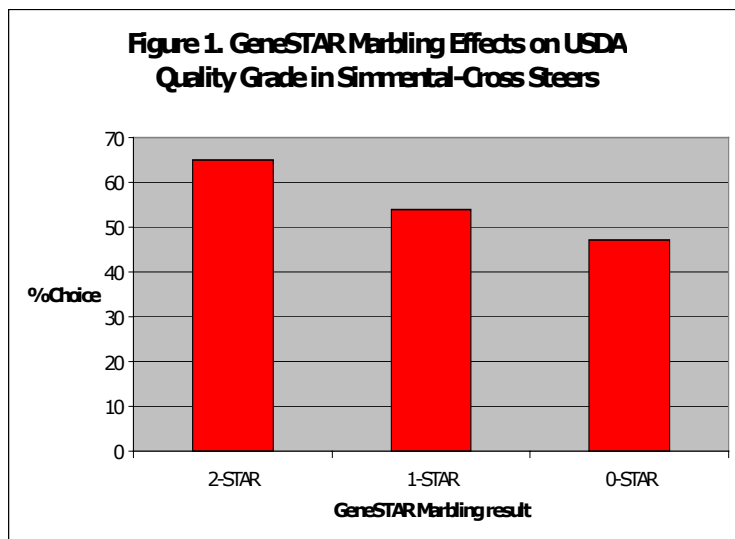
GeneSTAR® Marbling results had a statistically significant and substantial effect on the proportion of steers that graded Choice versus Select.

Table 2 and Figure 1 show the average percent of Choice grades for each STAR genotype.

Table 2. GeneSTAR® Marbling Effects on USDA Quality Grade in Simmental-Cross Steers

GeneSTAR® Marbling Result	USDA Quality Grade % Choice (Fixed model)	USDA Quality Grade % Choice (Mixed model)
	64	65
	54	54
	47	47

Seventeen to eighteen percent more 2-STAR steers and 7% more 1-STARS graded USDA Choice compared to 0-STAR steers.



Conclusions

An independent study conducted by researchers from NBCEC, found significant effects of GeneSTAR® Marbling on USDA Quality Grade in a group of Simmental-cross steers.

The 2-STAR effects on Marbling Score (an increase of 11-14 points) and on Quality Grade (an extra 17-18% Choice) are very similar to an earlier study of calf-feds conducted by Genetic Solutions in the USA (see GeneNOTE 3). The 1-STAR effect on Quality Grade of +7% Choice was also similar to the earlier study.

Commercial Implications

Results from this study are consistent with previous research that has shown that the GeneSTAR® Marbling test identifies animals with high marbling potential. Once again, in this study the increase in Marbling Score translates into a substantial increase in higher grading carcasses.

The absolute improvement in Quality Grade associated with GeneSTAR® Marbling will always be dependent on finish end-point. GeneSTAR® Marbling impact will be greatest when a high proportion of animals judged to have marbling potential based on breed type, are clustered around the Select/Choice cut-off, as is normal in commercial practice where animals are fed for Choice and Premium Choice grades.

This study adds to the knowledge base of NBCEC researchers who are working out how best to incorporate gene marker data into EPDs.

**Agricultural Business South
Africa (Pty) Ltd**

Postal: P.O. Box 543, Irene, 0062
 Phone: 012 6675258 Fax:012 6675259
 Web: www.agribsa.co.za
 Web: www.geneticsolutions.com.au