AMERICAN ANGUS ASSOCIATION®

Sire Evaluation Report

SPRING 2014

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Angus Sire Evaluation Information

From a total of **231,410** sires with progeny records in the American Angus Association database, the *Spring 2014 Sire Evaluation Report* lists **2,193** sires with the following qualifications.

1. The sire must have at least 35 yearling progeny weights in proper contemporary groups on Angus Herd Improvement Records (AHIR®).
2. The sire must have a yearling accuracy value of at least 0.40.
3. The sire must have had at least 5 calves recorded in the American Angus Association Herd Book since **Jan. 1, 2012.**

The Young Sire Supplement lists **2,658** bulls born after **Jan. 1, 2010,** that have at least 10 progeny weaning weights on AHIR and have a weaning accuracy of at least 0.30.

The American Angus Association takes reasonable research and editing measures to ensure the quality of the genetic prediction analysis and other information made available in this report. However, the American Angus Association does not guarantee or assume responsibility for the accuracy, timeliness, correctness, or completeness of information available in this report. The information presented here should not be considered or represented to be a measure of the actual value of the animal or its progeny or a guarantee of performance. Any conclusions that users draw from the information presented here are their own and are not to be attributed to the American Angus Association.

The American Angus Association has available upon request additional booklets explaining expected progeny differences (EPD) and national cattle evaluation procedures (NCE).

To view the latest *Sire Evaluation Report* online, visit *www.angussiresearch.com.*

Calving Ease

Calving ease. Heifer calving ease expected progeny differences (EPDs) were calculated using a multi-trait animal model including birth weight and calving score data along with genomic results. The result is a heifer calving ease direct and a heifer calving ease maternal EPD, as defined below.

Calving ease direct (CED): Calving ease direct EPD is expressed as a difference in percentage of unassisted births, with a higher value indicating greater calving ease in first-calf heifers. It predicts the average difference in ease with which a sire's calves will be born when the sire is bred to first-calf heifers.

Calving ease maternal (CEM): Calving ease maternal EPD is expressed as a difference in percentage unassisted births with a higher value indicating greater calving ease in first-calf daughters. It predicts the average ease with which a sire's daughters will calve as first-calf heifers when compared to daughters of other sires.

How to Read the Report

Each bull listed in this report is comparable to every other bull in the database. The analysis takes into account only the differences expressed in each herd in which the bulls were used. For example, bull A has a weaning EPD of +30 lb. and bull B has a weaning EPD of +20 lb. If you randomly mate these bulls in your herd, you could expect bull A's calves to weigh, on average, 10 lb. more at weaning than bull B's progeny (30 – 20 = 10).

EXPECTED PROGENY DIFFERENCES AND $VALUES

SIRE STATISTICS	PRODUCTION								MATERNAL									CARCASS						$VALUES			
	CED ACC	BW ACC	WW ACC	YW ACC	RADG ACC	YH ACC	SC ACC	Doc ACC	HP ACC	CEM ACC	Milk ACC	MkH MkD	MW ACC	MH ACC	$EN	CW ACC	Marb ACC	RE ACC	Fat ACC	CGrp CProg	UGrp UProg	$W	$F $G	$QG $YG	$B
A A R NEW TREND	+1	+5.7	+29	+52	+.14	+.8	+2.21	-6	+15.3	+7	+27	1342	+17	+.2	+3.58	+17	+.25	+.37	+.002	19	309	+14.11	-1.09	+17.48	+54.75
#9958634 04-05-81	.90	.97	.96	.95	.58	.92	.93	.73	.59	.91	.95	3506	.90	.90		.83	.84	.84	.84	197	531		+24.43	+6.95	

Accuracy (ACC) is the reliability that can be placed on an expected progeny difference (EPD). An accuracy of close to 1.0 indicates higher reliability. Accuracy is affected by the number of progeny, pedigree and genomic information included in the analysis.

$Values are multi-trait selection indexes, expressed in dollars per head, to assist beef producers by adding simplicity to genetic selection decisions. The $Value is an estimate of how future progeny of each sire are expected to perform, on average, compared to progeny of other sires in the database if the sires were randomly mated to cows and if calves were exposed to the same environment.

Expected progeny difference (EPD) is the prediction of how future progeny of each animal are expected to perform relative to the progeny of other animals listed in the database. EPDs are expressed in units of measure for the trait, plus or minus. Interim EPDs may appear for young animals when their performance is yet to be incorporated into the American Angus Association National Cattle Evaluation (NCE) procedures. This EPD will be preceded by an "I," and may or may not include the animal's own performance record for a particular trait, depending on its availability, appropriate contemporary grouping, or data edits needed for NCE.

PRODUCTION TRAITS

Calving ease direct (CED) is expressed as a difference in percentage of unassisted births, with a higher value indicating greater calving ease in first-calf heifers. It predicts the average difference in ease with which a sire's calves will be born when he is bred to first-calf heifers.

Birth weight EPD (BW), expressed in pounds, is a predictor of a sire's ability to transmit birth weight to his progeny compared to that of other sires.

Weaning weight EPD (WW), expressed in pounds, is a predictor of a sire's ability to transmit weaning growth to his progeny compared to that of other sires.

Yearling weight EPD (YW), expressed in pounds, is a predictor of a sire's ability to transmit yearling growth to his progeny compared to that of other sires.

Residual average daily gain (RADG), expressed in pounds per day, is a predictor of a sire's genetic ability for postweaning gain in future progeny compared to that of other sires, given a constant amount of feed consumed.

Yearling height EPD (YH), expressed in inches, is a predictor of a sire's ability to transmit yearling height compared to that of other sires.

Scrotal circumference EPD (SC), expressed in centimeters, is a predictor of a sire's ability to transmit scrotal size compared to that of other sires.

Docility (DOC) is expressed as a difference in yearling cattle temperament, with a higher value indicating more favorable docility. It predicts the average difference of progeny from a sire in comparison with another sire's calves. In herds where temperament problems are not an issue, this expected difference would not be realized.

Growth

Birth weight/weaning weight/yearling weight/maternal milk. Growth traits were evaluated together in a multi-trait model. As it is recommended for the evaluation of maternally influenced traits, a direct genetic effect, a maternal genetic effect and a maternal permanent environmental effect were fitted for birth and weaning weights. Postweaning gain was not considered to be maternally influenced; therefore, the direct genetic effect was the only random effect fitted. Yearling weight EPDs were calculated from the EPDs for weaning weight direct and postweaning gain. The evaluation includes individual weights on embryo transfer calves out of registered Angus recipient females, provided any other national cattle evaluation (NCE) requirements for edited data are met. Genomic results are included for each weight trait and maternal milk.

Residual average daily gain. The steps to generate the components needed to calculate the residual average daily gain (RADG) EPD include a comprehensive genetic evaluation of multiple phenotypic traits, including the phenotypic feed-intake data collected on individual animals through research and tests. Also, the dry-matter intake genomic predictions are used as an indicator trait in the intake-evaluation process. The resulting feed-intake genetic component from the multi-trait animal model analysis is used to calculate RADG. The genetic RADG EPD reflects composition-constant genetic potential for growth given a constant amount of feed. It characterizes postweaning gain among animals given the same amount of feed consumed. RADG is presented in pounds per day, with a higher value being more favorable.

Yearling height and scrotal evaluations. Yearling height and scrotal circumference traits are analyzed separately using a multi-trait animal model in the genetic evaluation. Both the height and scrotal evaluations include genetically correlated measures for yearling weight and any available genomic results. Yearling height EPDs are reported in inches and are reported on bulls and heifers at or near a year of age. Scrotal circumference EPDs, generated from scrotal data collected on yearling Angus bulls, are presented in centimeters.

Docility. Yearling temperament scores were used with a four-generation pedigree to calculate an EPD for docility. Four categories were used, for scores 1, 2, 3 and the combined category of scores 4, 5 and 6. In addition, the genomic predictions for docility are used as an indicator trait in the evaluation process. The docility EPD is presented as a percentage, where a higher value is considered more favorable in terms of docile temperament. Since this is a threshold trait, herds that exhibit no problems in temperament will realize no improvement in selecting for favorable docility EPDs.

Heifer pregnancy. The heifer pregnancy (HP) EPDs are designed to characterize differences among sires in the Angus breed for daughters' heifer pregnancy. When comparing two sires based on

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MATERNAL TRAITS

Heifer pregnancy (HP) is a selection tool to increase the probability or chance of a sire's daughters becoming pregnant as first-calf heifers during a normal breeding season. A higher EPD is the more favorable direction and the EPD is reported in percentage units.

Calving ease maternal (CEM) is expressed as a difference in percentage of unassisted births with a higher value indicating greater calving ease in first-calf daughters. It predicts the average ease with which a sire's daughters will calve as first-calf heifers when compared to daughters of other sires.

Maternal milk EPD (Milk), expressed in pounds of calf weaned, is a predictor of a sire's genetic merit for milk and mothering ability as expressed in his daughters compared to daughters of other sires. In other words, it is that part of a calf's weaning weight attributed to milk and mothering ability.

MkH indicates the number of herds from which daughters are reported as having progeny weaning weight records included in the analysis.

MkD indicates the number of daughters that have progeny weaning weight records included in the analysis.

Mature weight EPD (MW), expressed in pounds, is a predictor of the difference in mature weight of daughters of a sire compared to the daughters of other sires.

Mature height EPD (MH), expressed in inches, is a predictor of the difference in mature height of a sire's daughters compared to daughters of other sires.

Cow energy value ($EN), expressed in dollar savings per cow per year, assesses differences in cow energy requirements as an expected dollar savings difference in daughters of sires. A larger value is more favorable when comparing two animals (more dollars saved on feed energy expenses). Components for computing the cow $EN savings difference include lactation energy requirements and energy costs associated with differences in mature cow size.

CARCASS TRAITS

Carcass weight EPD (CW), expressed in pounds, is a predictor of the differences in hot carcass weight of a sire's progeny compared to progeny of other sires.

Marbling EPD (Marb), expressed as a fraction of USDA marbling score, is a predictor of the difference in marbling of a sire's progeny compared to progeny of other sires.

Ribeye area EPD (RE), expressed in square inches, is a predictor of the difference in ribeye area of a sire's progeny compared to progeny of other sires.

Fat thickness EPD (Fat), expressed in inches, is a predictor of the differences in external fat thickness at the 12th rib (as measured between the 12th and 13th ribs) of a sire's progeny compared to progeny of other sires.

Group/progeny (CGrp/CProg and UGrp/UProg) reflects the number of contemporary groups and the number of carcass and ultrasound progeny included in the analysis.

$VALUE INDEXES

Weaned Calf Value ($W), an index value expressed in dollars per head, is the expected average difference in future progeny performance for preweaning merit. $W includes both revenue and cost adjustments associated with differences in birth weight, weaning direct growth, maternal milk and mature cow size.

Feedlot Value ($F), an index value expressed in dollars per head, is the expected average difference in future progeny performance for postweaning merit compared to progeny of other sires.

Grid Value ($G), an index value expressed in dollars per head, is the expected average difference in future progeny performance for carcass grid merit compared to progeny of other sires.

Quality Grade ($QG) represents the quality grade segment of the economic advantage found in $G. $QG is intended for the specialized user wanting to place more emphasis on improving quality grade. The carcass marbling (Marb) EPD contributes to $QG.

Yield Grade ($YG) represents the yield grade segment of the economic advantage found in $G. $YG is intended for the specialized user wanting to place more emphasis on red meat yield. It provides a multi-trait approach to encompass ribeye, fat thickness and weight into an economic value for red meat yield.

Beef Value ($B), an index value expressed in dollars per head, is the expected average difference in future progeny performance for postweaning and carcass value compared to progeny of other sires.

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their HP EPDs (reported in units of percentage), a higher-EPD sire would be expected to have daughters with a greater probability or chance of becoming pregnant than a sire with the lower EPD.

A performance database is assembled using available breeding information on first-calf heifers. A heifer's breeding record is coded as a success or failure of being pregnant based on any pregnancy check data or calving information recorded and submitted by the breeder. The heifer contemporary group is defined as breeding herd, breeding year, season and synchronization code. Edited data on heifers are analyzed in a threshold analysis with a full animal model and three-generation pedigree. Genomic HD 50K predictions for heifer pregnancy are included as a correlated trait.

Mature Cow Size

Mature weight and height are highly heritable traits, indicating that selection for these traits can be effective. The mature size genetic evaluation is a multi-trait animal model using repeated measures on cows from yearling age throughout their lifetime.

A body condition score must be included with the cow weight in order for data to be utilized to calculate mature size EPDs in the NCE. Any cow weights submitted without a body condition score are not used. For more information on body condition score, go to *www.cowbcs.info.*

As a reminder for weaning time, cow weights with a body condition score need to be taken ± 45 days of the calf's weaning measure date. Cow hip heights may be captured at this time, also. It is important to collect this information after the cow has weaned her first calf, and then again in subsequent years.

Genomic results for mature weight are additional genetic indicators in the analysis. EPDs are generated for mature weight and mature height based on these varying amounts of performance information and pedigree relationships. The resulting EPDs are representative of the genetics for Angus cow size at a projected 6 years of age.

Carcass

Carcass EPDs are calculated from an integrated analysis of the Beef Improvement Records carcass, ultrasound and genomic databases. The weekly genetic evaluations result in a single EPD for carcass weight, marbling score, ribeye area and fat thickness. The units of measure for EPDs are in carcass-trait format — marbling score, carcass weight in pounds, carcass ribeye in square inches, and carcass fat thickness in inches. Ultrasound, carcass, genomic and pedigree databases are simultaneously combined into one set of genomic-enhanced carcass EPDs for Angus breeding programs.

The carcass and ultrasound data contributing to the evaluation are described in Table 1 and Table 2 with average adjusted measurements.

Ultrasound images incorporated into the carcass EPDs were collected by field technicians certified by the Ultrasound Guidelines Council (UGC). The images were interpreted through one of the American Angus Association's authorized ultrasound processing labs by UGC-certified lab technicians.

Genomic-enhanced expected progeny differences (EPDs) contained in this report are calculated using the American Angus Association database along with results from the Zoetis HD 50K for Angus and the GeneSeek Angus GGP-HD. Published EPDs include genomic results.

EPDs and associated $Values in this report were as of **Dec. 6, 2013.** For the most up-to-date information, go to *www.angus.org* and select "EPD/Pedigree Lookup" from the "Data Searches/Tools" menu.

Table 1: Angus phenotypic averages of steer and heifer carcasses

	Age at harvest, days			
	330 < Age < 480		481 < Age <799	
Heifers:	**Avg.**	**SD[1]**	**Avg.**	**SD**
Avg. age at harvest, days	438	29	541	47
Adj.[2] carcass wt., lb.	694	82	693	95
Adj. fat thickness, in.	0.58	0.18	0.52	0.18
Adj. ribeye area, sq. in.	11.98	1.34	12.00	1.49
Adj. marbling score	6.64	1.29	6.16	1.31
No. of heifers	4,646		5,152	
Steers (carcass):				
Avg. age at harvest, days	437	25	522	40
Adj. carcass wt., lb.	786	82	762	97
Adj. fat thickness, in.	0.56	0.17	0.53	0.18
Adj. ribeye area, sq. in.	12.54	1.32	12.53	1.42
Adj. marbling score	6.15	1.06	5.76	1.21
No. of steers	67,055		23,338	

[1]SD = standard deviation.
[2]Carcasses adjusted to 480 days of age at harvest.

Table 2: Yearling Angus live-animal and ultrasound measures

	Bulls		Heifers		Steers	
Trait	**Avg.**	**SD[1]**	**Avg.**	**SD**	**Avg.**	**SD**
Age, days	371	26	389	30	407	38
Gain, lb./day	2.91	0.69	1.51	0.52	2.87	0.75
Adj. scan wt., lb.	1,113	136	863	111	1,097	168
Adj. %IMF, %	3.77	1.04	4.70	1.34	4.88	1.43
Adj. ribeye area, sq. in.	12.45	1.87	9.69	1.72	12.17	2.23
Adj. 12th-rib fat thickness, in.	0.28	0.10	0.27	0.11	0.39	0.15
Adj. rump fat thickness, in.	0.30	0.11	0.30	0.12	0.40	0.15
Total animals	859,220		615,023		11,964	

[1]SD = standard deviation.

As a review, the scoring system for marbling and its relationship to the USDA Quality Grading System is defined in Table 3. For a carcass to meet *Certified Angus Beef®* (CAB®) brand standards, it must have a Modest (average Choice) or higher marbling degree, be of "A" maturity (the most youthful classification for beef), have a 10- to 16-square-inch ribeye, less than 1 inch fat thickness, less than a 1,000-pound hot carcass weight and a fine to medium marbling texture. For more details, go to *www.cabpartners.com.*

Table 3: USDA quality grading system and marbling score

Quality Grade	Amount of Marbling	Numerical Score
Prime+	Abundant	10.0-10.9
Prime	Moderately abundant	9.0-9.9
Prime-	Slightly abundant	8.0-8.9
Choice+	Moderate	7.0-7.9
Choice	Modest	6.0-6.9
Choice-	Small	5.0-5.9
Select	Slight	4.0-4.9
Standard	Traces	3.0-3.9
Standard	Practically devoid	2.0-2.9
Utility	Devoid	1.0-1.9

Adjustment Factors to Estimate Across-breed EPDs

Researchers at the Roman L. Hruska U.S. Meat Animal Research Center (USMARC) in Clay Center, Neb., develop breed adjustment factors annually so that expected progeny difference (EPD) values can be compared across breeds. This process allows the estimation of across-breed EPDs, sometimes referred to as AB-EPDs.

The AB-EPD concept was introduced in the late 1980s and continues to spark interest with commercial bull buyers using more than one breed of bull. This is mostly due to the fact that without adjustments, the within-breed EPDs cannot be used to directly compare animals of different breeds, since the values are typically computed separately for each breed.

Table 1 presents the most recent USMARC adjustment factors that can be added to the EPDs of animals of different breeds, adjusting their EPD values to an Angus equivalent. The adjustment factors, given relative to an Angus equivalent of zero for each trait, take into account breed differences measured in the Germplasm Evaluation Project at USMARC, as well as differences in breed average EPDs and base year.

Animals of various breeds can be compared on the same EPD scale after adding the specific adjustment factor to EPDs produced in the most recent genetic evaluations of the representative breeds.

Use of these factors does not change differences in EPDs among bulls within a breed. However, it does affect differences among bulls of different breeds. The example in Table 2 illustrates EPDs for Angus and Simmental bulls after across-breed adjustment factors have been applied to estimate AB-EPDs. The AB-EPDs for Simmental Bull #002 are on an Angus-equivalent scale and can be directly compared with values for Angus Bull #001.

It is important to remember that EPDs are not perfect when comparing bulls, even within a breed; therefore, AB-EPDs are somewhat less accurate when comparing animals of different breeds. AB-EPDs are most effective for selecting bulls of two or more breeds for use in systematic crossbreeding.

When evaluating the potential application of AB-EPDs as a tool for a particular breeding program, commercial cow-calf producers must first examine the needs of their individual operations. Producers must diligently review their breed choices and crossbreeding systems in order to provide the best sire selection match to cow genetic type, environment, feed resources and market targets.

Table 2: Example of using across-breed adjustment factors to convert noncomparable within-breed EPDs to comparable across-breed EPDs

		BW	WW	YW	Milk
Angus	AB adj. factors[1]:	0.0	0	0	0
Bull #001	EPDs[2]:	2.9	42	83	16
	AB-EPDs[3]:	2.9	42	83	16
Simmental	AB adj. factors[1]:	3.7	-6	-11	-1
Bull #002	EPDs[2]:	1.8	61	89	27
	AB-EPDs[3]:	5.5	55	78	26

[1]AB adj. factors are the across-breed adjustment factors from Table 1.
[2]EPDs are the within-breed EPD values from the breed's genetic evaluation for the bull of interest.
[3]Across-breed EPDs after adjustment factors are applied to within-breed EPDs.

Table 1: Adjustment factors to estimate across-breed EPDs

Breed	BW	WW	YW	Milk	Marb	RE	Fat
Angus	0.0	0.0	0.0	0.0	0.00	0.00	0.000
Hereford	2.7	-3.5	-23.6	-17.1	-0.32	-0.09	-0.050
Red Angus	3.4	-23.2	-27.9	-3.9	-0.30	-0.08	-0.029
Shorthorn	5.8	11.3	38.8	20.2	-0.16	0.21	-0.142
South Devon	3.2	-4.8	-6.6	-0.3	0.08	0.16	-0.111
Beefmaster	6.3	35.7	29.5	9.9			
Brahman	11.0	42.8	5.9	23.2			
Brangus	4.5	14.6	6.0	5.8			
Santa Gertrudis	6.6	36.2	48.3	12.4	-0.66	-0.05	-0.116
Braunvieh	1.9	-21.6	-42.3	0.1	-0.67	0.22	-0.102
Charolais	8.6	38.1	45.3	6.9	-0.44	1.02	-0.220
Chiangus	2.2	-20.5	-40.2	4.7	-0.45	0.45	-0.157
Gelbvieh	2.7	-18.2	-25.6	3.6	-0.41	0.78	-0.136
Limousin	3.8	-1.8	-35.9	-8.7	-0.71	1.09	
Maine Anjou	4.2	-15.3	-36.7	-6.8	-0.84	0.95	-0.229
Salers	1.8	-4.8	-19.5	2.2	-0.10	0.79	-0.207
Simmental	3.7	-5.9	-10.9	-0.8	-0.42	0.53	-0.141
Tarentaise	1.7	30.3	20.3	24.1			

Source: 2013 BIF Proceedings, Oklahoma City, Okla.

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Angus $Values

The use of multi-trait selection indexes as tools for commercial cow-calf operators and seedstock breeders is rapidly evolving in the beef industry. Selection indexes are tools to select for several traits at once. An index approach takes into account genetic and economic values to select for economic merit. A multi-trait index approach can be contrasted to single-trait selection or independent culling levels. An index is challenging to develop, but the end result is easy to use, adding the simplicity and convenience of a multi-trait approach.

The expected progeny differences (EPDs) currently available through the American Angus Association, along with numerous individual performance measures, can become overwhelming. Weaned Calf Value ($W), Feedlot Value ($F), Grid Value ($G) and Beef Value ($B) are bioeconomic values, expressed in dollars per head, to assist commercial beef producers by adding simplicity to genetic selection decisions.

$Values encompass the revenue generated from genetically derived outputs and associated costs (expenses) from required inputs. $Values only have meaning when used in comparing the relative merit or ranking of two individuals. Each sire listed in this report is comparable to every other sire. The $Values are sensitive to the assumptions for the industry-relevant components used in calculating the indexes.

As with EPDs, variation in $Values between animals indicates expected differences in the relative value of progeny if random mating is assumed. Thus, a $Value has meaning only when used in comparison to the $Value of another animal. Also, averages and percentile breakdowns are provided for $Values as reference points for the Angus database. A $Value of 0 does not correlate to the lowest ranking or to an average animal.

Weaned Calf Value ($W)

Weaned Calf Value ($W) quantifies four primary economic impact areas:

- Birth weight — birth weight influences on calf death losses related to dystocia, weaned calf crop percentage and resulting revenue per cow.
- Weaning weight — direct growth impact on weaning weight revenue (preweaning growth and pounds of calf sold) and energy requirements and related costs necessary to support preweaning calf growth.
- Maternal milk — revenue from calf preweaning growth and pounds of calf sold as influenced by varying cow milk levels, and costs related to lactation energy requirements.
- Mature cow size — expense adjustments are made for maintenance energy as related to differing mature cow size, including mathematical linkages between mature weight and yearling weight.

The impact areas are combined into a bioeconomic value expressed in dollars per head assigned to Angus genetics from birth through weaning. Resources used to form the $W include the National Research Council (NRC), Roman L. Hruska U.S. Meat Animal Research Center (USMARC), CattleFax, Standardized Performance Analysis (SPA) and university cow-calf budgets, and the American Angus Association performance database.

$W provides the expected dollar-per-head difference in future progeny preweaning performance in a multi-trait fashion, within a typical U.S. beef cow herd. Assume, for example, Bull A has a $W of +25.00 and Bull B has a $W of +15.00. If these sires were randomly mated to a comparable set of females, the calves were exposed to the same environment, and a normal number of replacement females were saved from both sires, on average you could expect Bull A's progeny to have a +10.00-per-head advantage in preweaning value over Bull B's progeny (25.00 - 15.00 = +10.00 per head). As with any $Value, $W has meaning when used in comparing the relative merit or ranking of two individuals.

The $W includes the following assumptions:

Base calf price	$145 per cwt.
Cow/heifer mix	80%/20%
Cow weight	1,300 lb.
Feed energy cost	$0.090 per Mcal NE_m

Cow Energy Value ($EN)

A Cow Energy Value ($EN) is available to assess differences in cow energy requirements, expressed in dollars per cow per year, as an expected dollar savings difference in future daughters of sires. A larger value is more favorable when comparing two animals (more dollars saved on feed energy expenses). Components for computing the cow $EN savings difference include maintenance requirements for lactation and energy costs, as well as those associated with differences in mature cow size.

Cow Energy ($EN) Savings, $/cow/year	+15.75

Cow Energy ($EN) Savings, $/cow/year	+4.68

In the above example, the expected difference in cow energy savings per cow per year for future daughters of the two animals is +11.07 (15.75 - 4.68 = +11.07).

Feedlot Value, Grid Value and Beef Value

Feedlot Value ($F), Grid Value ($G) and Beef Value ($B) are provided as postweaning bioeconomic $Values, expressed in dollars per head, to assist commercial beef producers by adding simplicity to genetic selection decisions. The $Values were developed primarily to serve as selection tools for commercial bull buyers.

$Values are reported in dollars per head, as illustrated below:

	$F	$G	$B
Example	+22.85	+19.33	+37.12

Although feedlot and carcass merit are important components of the beef production chain, it should be stressed to producers that the $Values ($F, $G, $B) are not to be used as a single selection criterion, since the indexes only encompass postweaning and carcass performance.

$Values have meaning when used in comparing the relative merit or ranking of two individuals. Each sire listed in this report is comparable to every other sire. For example, Bull 1 has a $B value of +26.00, and Bull 2 has a $B value of +16.00. If these bulls were randomly mated to a comparable set of females and the calves were exposed to the same environment, on average you would expect Bull 1's progeny to have a $10-per-head advantage in postweaning performance and carcass merit over Bull 2's progeny (26.00 - 16.00 = +10.00 per head).

$Feedlot, $Grid, and $Beef Values incorporate available EPDs, converted into economic terms, using industry-relevant components for feedlot performance and carcass merit. The base components used to calculate $Values for any registered animal are:

Feedlot assumptions:

Time on feed	160 days
Ration cost	$305 per dry ton
Fed market	$115 per cwt. live

Grid assumptions:

Quality components:	
Prime premium (above Choice)	$14.00
CAB premium (above Choice)	$4.00
Choice-Select spread	$10.00
Standard discount	-$22.00
Yield components:	
YG 1 premium	$4.50
YG 2 premium	$2.25
YG 3 base	$0.00
YG 4 & 5 discount	-$18.00
Avg. carcass wt., lb.	816
Heavyweight discount	-$20.00

Feedlot Value ($F), an index value expressed in dollars per head, is the expected average difference in future progeny performance for postweaning merit compared to progeny of other sires. $F incorporates weaning weight (WW) and yearling weight (YW) EPDs along with trait interrelationships. Typical feedlot gain value, feed consumption and cost differences are accounted for in the final calculations, along with a standard set of industry values for days on feed, ration costs and cash cattle price.

Grid Value ($G), an index value expressed in dollars per head, is the expected average difference in future progeny performance for carcass grid merit compared to progeny of other sires. The $G combines quality grade and yield grade attributes, and is calculated for animals with carcass EPDs. A three-year rolling average is used to establish typical industry economic values for quality grade and yield grade schedules. Quality grade premiums are specified for Prime, *Certified Angus Beef®* (CAB®) and Choice carcasses, as well as discounts for Select and Standard. Yield grade premiums are incorporated for YG 1 and YG 2 (high-yielding carcasses), with discounts for YG 4 and YG 5 (low red meat yields). Grid impact in dollars per hundredweight (cwt.) and dollars per head is calculated from the yield and quality grade components, and then combined to arrive at the $G.

Quality Grade ($QG) represents the quality grade segment of the economic advantage found in $G. $QG is intended for the specialized user wanting to place more emphasis on improving quality grade. The carcass marbling (Marb) EPD contributes to $QG.

Yield Grade ($YG) represents the yield grade segment of the economic advantage found in $G. $YG is intended for the specialized user wanting to place more emphasis on red meat yield. It provides a multi-trait approach to encompass ribeye, fat thickness and weight into an economic value for red meat yield.

Beef Value ($B) facilitates the simultaneous multi-trait genetic selection for feedlot and carcass merit, based on dollars and cents. $B represents the expected average dollar-per-head difference in the progeny postweaning performance and carcass value compared to progeny of other sires. The $B value encompasses $F and $G. To align $B with marketplace realities and appropriately value carcass weight in Angus cattle, the following factors are incorporated into the final calculations for $B.

- $B is not simply the sum of $F and $G.
- Projected carcass weight and its value are calculated, along with production cost differences.
- $B takes into consideration any discount for heavyweight carcasses.
- Final adjustments are made to prevent double-counting weight between feedlot and carcass segments.

The resulting $B value is not designed to be driven by one factor, such as quality, red meat yield or weight. Instead, it is a dynamic result of the application of commercial market values to Angus genetics for both feedlot and carcass merit.

Availability of EPDs and $Values

Weekly EPDs and $Values on individual animals may be viewed on the Association website, *www.angus.org.* Members and affiliates can also access EPDs and $Values through AAA Login.

An interactive application for Custom $Values ($W, $F, $G, $B) is available for members and affiliates through AAA Login. Users can customize economic components to create tailored within-herd $Values for their given scenarios. The Custom $Values are designed for within-herd use in assisting commercial bull buyers producing to a specified market.

Direct questions about American Angus Association performance programs to ahir@angus.org or 816-383-5100.

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Spring 2014 EPD and $Value Percentile Breakdowns

CURRENT SIRES

	Production								Maternal						Carcass				$Values					
TOP PCT	CED	BW	WW	YW	RADG	YH	SC	Doc	HP	CEM	Milk	MW	MH	$EN	CW	Marb	RE	Fat	$W	$F	$G	$QG	$YG	$B
1%	+16	-2.9	+73	+125	+.31	+1.3	+2.11	+32	+15.6	+15	+38	+100	+1.3	+36.65	+57	+1.20	+1.09	-.054	+51.94	+72.73	+53.34	+44.85	+14.14	+107.55
2%	+14	-2.2	+70	+120	+.29	+1.2	+1.93	+29	+14.7	+14	+36	+91	+1.1	+29.47	+54	+1.08	+.99	-.046	+48.77	+67.02	+50.79	+42.58	+13.22	+103.25
3%	+14	-1.9	+68	+117	+.28	+1.1	+1.82	+28	+14.2	+14	+35	+86	+1.0	+25.12	+51	+1.01	+.93	-.041	+47.21	+63.29	+49.08	+41.17	+12.63	+100.10
4%	+13	-1.6	+66	+114	+.27	+1.1	+1.73	+27	+13.8	+13	+34	+82	+1.0	+22.33	+49	+.95	+.89	-.037	+45.80	+60.60	+47.83	+40.11	+12.17	+98.00
5%	+13	-1.4	+65	+112	+.26	+1.0	+1.66	+26	+13.5	+13	+34	+77	+.9	+20.05	+48	+.91	+.86	-.033	+44.76	+58.25	+46.92	+39.24	+11.79	+96.44
10%	+11	-.6	+61	+106	+.23	+.9	+1.44	+22	+12.3	+12	+31	+65	+.8	+13.18	+42	+.78	+.74	-.024	+41.17	+51.32	+42.87	+35.96	+10.34	+90.87
15%	+10	-.1	+58	+102	+.22	+.8	+1.30	+20	+11.5	+11	+30	+58	+.7	+9.45	+39	+.70	+.67	-.017	+38.96	+47.10	+40.15	+33.86	+9.25	+87.22
20%	+10	+.2	+56	+99	+.21	+.8	+1.19	+18	+10.9	+11	+29	+52	+.6	+6.72	+36	+.64	+.61	-.012	+37.28	+43.81	+37.89	+32.04	+8.54	+84.11
25%	+9	+.6	+55	+96	+.20	+.7	+1.09	+17	+10.4	+10	+28	+48	+.6	+4.35	+34	+.59	+.56	-.008	+35.90	+40.85	+35.90	+30.36	+7.77	+81.30
30%	+8	+.8	+53	+94	+.19	+.7	+1.00	+15	+9.9	+10	+27	+43	+.5	+2.51	+32	+.55	+.51	-.004	+34.70	+38.35	+34.03	+29.07	+7.13	+78.76
35%	+8	+1.1	+52	+91	+.18	+.6	+.93	+14	+9.5	+10	+26	+39	+.5	+.81	+30	+.51	+.47	+.000	+33.66	+36.03	+32.42	+27.71	+6.44	+76.31
40%	+7	+1.3	+50	+89	+.17	+.6	+.86	+13	+9.1	+9	+25	+36	+.4	-.81	+29	+.48	+.43	+.003	+32.66	+33.86	+30.80	+26.64	+5.84	+74.03
45%	+6	+1.5	+49	+87	+.16	+.6	+.79	+12	+8.8	+9	+25	+33	+.4	-2.33	+27	+.44	+.39	+.006	+31.73	+31.71	+29.27	+25.10	+5.21	+71.71
50%	+6	+1.8	+48	+85	+.16	+.5	+.72	+11	+8.5	+8	+24	+30	+.3	-3.76	+26	+.41	+.35	+.010	+30.77	+29.52	+27.81	+23.81	+4.60	+69.45
55%	+5	+2.0	+46	+83	+.15	+.5	+.65	+10	+8.2	+8	+23	+26	+.3	-5.30	+24	+.38	+.32	+.013	+29.85	+27.48	+26.28	+22.61	+3.98	+67.19
60%	+5	+2.2	+45	+81	+.14	+.4	+.58	+9	+7.9	+7	+22	+23	+.2	-6.78	+23	+.34	+.28	+.016	+28.86	+25.45	+24.71	+21.43	+3.33	+64.77
65%	+4	+2.5	+44	+78	+.13	+.4	+.51	+7	+7.6	+7	+22	+19	+.2	-8.41	+21	+.31	+.25	+.020	+27.86	+23.16	+23.07	+20.13	+2.59	+62.33
70%	+3	+2.7	+42	+76	+.13	+.3	+.43	+6	+7.3	+6	+21	+15	+.1	-9.92	+19	+.28	+.20	+.024	+26.79	+20.62	+21.45	+18.93	+1.89	+59.68
75%	+3	+3.0	+40	+73	+.12	+.3	+.35	+5	+6.8	+6	+20	+10	+.1	-11.64	+17	+.25	+.16	+.027	+25.63	+17.90	+19.75	+17.04	+1.01	+56.52
80%	+2	+3.2	+39	+70	+.11	+.2	+.26	+3	+6.4	+5	+18	+6	+.0	-13.55	+15	+.21	+.11	+.032	+24.32	+14.90	+17.84	+15.60	+.07	+52.94
85%	+1	+3.6	+36	+66	+.10	+.2	+.16	+1	+5.8	+5	+17	+0	+.0	-15.80	+13	+.17	+.06	+.037	+22.78	+11.25	+15.69	+13.64	-1.07	+48.36
90%	-1	+4.0	+33	+61	+.08	+.0	+.03	-2	+5.0	+3	+15	-7	-.1	-18.47	+10	+.11	-.01	+.044	+20.69	+6.31	+13.16	+10.77	-2.55	+41.85
95%	-3	+4.7	+27	+51	+.06	-.2	-.17	-6	+3.8	+2	+12	-21	-.3	-22.79	+4	+.04	-.11	+.055	+17.21	-2.02	+9.14	+7.22	-4.98	+30.21
100%	-29	+15.3	-16	-33	-.16	-1.4	-1.44	-34	-7.5	-23	-17	-160	-1.9	-52.01	-48	-.52	-.73	+.148	-52.66	-63.95	-25.84	-25.93	-34.44	-62.59
Total Animals	**23,883**	**---------**	**24,048**	**---------**	**7,967**	**11,918**	**14,942**	**10,278**	**5,580**	**23,883**	**24,048**	**7,746**	**7,746**	**24,051**	**17,862**	**17,862**	**17,862**	**17,862**	**24,051**	**24,051**	**20,710**	**20,710**	**20,710**	**20,710**
Avg. EPD	**+5**	**+1.7**	**+47**	**+84**	**+.16**	**+.5**	**+.73**	**+10**	**+8.6**	**+8**	**+23**	**+29**	**+.3**	**-2.94**	**+26**	**+.43**	**+.36**	**+.010**	**+30.77**	**+29.04**	**+27.80**	**+23.64**	**+4.15**	**+67.28**

CURRENT DAMS

	Production								Maternal						Carcass				$Values					
TOP PCT	CED	BW	WW	YW	RADG	YH	SC	Doc	HP	CEM	Milk	MW	MH	$EN	CW	Marb	RE	Fat	$W	$F	$G	$QG	$YG	$B
1%	+14	-1.8	+63	+109	+.26	+1.3	+1.74	+27	+14.6	+15	+36	+97	+1.2	+32.35	+49	+1.09	+.97	-.051	+45.12	+55.01	+51.33	+42.78	+13.51	+99.24
2%	+13	-1.3	+61	+105	+.25	+1.2	+1.59	+25	+13.9	+14	+35	+86	+1.1	+28.03	+45	+1.00	+.88	-.044	+42.74	+51.01	+48.88	+40.76	+12.61	+95.43
3%	+12	-1.0	+59	+103	+.24	+1.1	+1.51	+24	+13.5	+14	+33	+80	+1.0	+25.47	+43	+.93	+.82	-.039	+41.28	+48.59	+47.28	+39.48	+12.02	+93.04
4%	+12	-.8	+58	+101	+.23	+1.1	+1.44	+23	+13.1	+13	+33	+76	+.9	+23.57	+41	+.88	+.78	-.036	+40.23	+46.72	+45.96	+38.18	+11.52	+91.17
5%	+11	-.6	+57	+100	+.22	+1.0	+1.39	+22	+12.8	+13	+32	+73	+.9	+22.02	+40	+.84	+.74	-.033	+39.39	+45.29	+44.85	+37.21	+11.13	+89.59
10%	+10	+.1	+54	+95	+.21	+.9	+1.21	+19	+11.8	+12	+30	+62	+.8	+16.93	+35	+.72	+.63	-.024	+36.69	+40.04	+40.89	+34.09	+9.71	+83.93
15%	+9	+.5	+52	+92	+.20	+.8	+1.08	+17	+11.1	+11	+28	+55	+.7	+13.66	+32	+.64	+.56	-.018	+34.97	+36.53	+38.15	+31.71	+8.79	+79.95
20%	+8	+.8	+50	+89	+.19	+.8	+.99	+16	+10.6	+10	+27	+49	+.6	+11.22	+30	+.59	+.50	-.013	+33.63	+33.73	+35.91	+30.03	+7.97	+76.71
25%	+7	+1.1	+49	+87	+.18	+.7	+.91	+14	+10.1	+10	+26	+45	+.6	+9.16	+29	+.54	+.45	-.010	+32.49	+31.37	+33.92	+28.81	+7.27	+73.94
30%	+7	+1.3	+48	+84	+.17	+.7	+.84	+13	+9.8	+9	+25	+41	+.5	+7.33	+27	+.50	+.41	-.006	+31.45	+29.23	+32.10	+27.35	+6.67	+71.46
35%	+6	+1.5	+46	+82	+.16	+.6	+.77	+12	+9.4	+9	+25	+38	+.5	+5.65	+25	+.47	+.37	-.003	+30.50	+27.20	+30.46	+25.83	+6.05	+69.15
40%	+6	+1.7	+45	+81	+.16	+.6	+.71	+11	+9.1	+9	+24	+34	+.4	+4.08	+24	+.43	+.33	+.000	+29.60	+25.37	+28.91	+24.70	+5.52	+66.97
45%	+5	+1.9	+44	+79	+.15	+.6	+.65	+10	+8.8	+8	+23	+31	+.4	+2.56	+23	+.40	+.29	+.003	+28.72	+23.44	+27.44	+23.44	+4.92	+64.85
50%	+5	+2.1	+43	+77	+.15	+.5	+.59	+9	+8.5	+8	+22	+28	+.3	+1.12	+21	+.37	+.26	+.006	+27.85	+21.65	+26.00	+22.23	+4.43	+62.75
55%	+4	+2.3	+42	+75	+.14	+.5	+.53	+8	+8.2	+7	+21	+25	+.3	-.37	+20	+.34	+.22	+.009	+26.99	+19.67	+24.57	+20.98	+3.84	+60.53
60%	+4	+2.5	+41	+73	+.14	+.5	+.48	+7	+7.9	+7	+21	+22	+.3	-1.81	+19	+.32	+.19	+.012	+26.10	+17.78	+23.17	+20.13	+3.34	+58.23
65%	+3	+2.7	+40	+71	+.13	+.4	+.42	+6	+7.6	+6	+20	+19	+.2	-3.33	+18	+.29	+.15	+.015	+25.16	+15.75	+21.76	+18.93	+2.71	+55.83
70%	+2	+2.9	+38	+68	+.12	+.4	+.35	+5	+7.4	+6	+19	+15	+.2	-4.99	+16	+.26	+.12	+.019	+24.17	+13.63	+20.32	+17.48	+2.09	+53.27
75%	+2	+3.1	+37	+66	+.12	+.3	+.29	+4	+7.0	+5	+18	+12	+.1	-6.70	+14	+.23	+.08	+.022	+23.08	+11.25	+18.80	+16.01	+1.35	+50.38
80%	+1	+3.4	+35	+63	+.11	+.3	+.21	+2	+6.6	+5	+17	+8	+.1	-8.53	+13	+.20	+.04	+.026	+21.85	+8.64	+17.15	+14.67	+.57	+47.04
85%	+0	+3.7	+33	+60	+.10	+.2	+.13	+1	+6.1	+4	+16	+3	+.0	-10.79	+11	+.16	-.01	+.031	+20.38	+5.54	+15.31	+13.25	-.46	+43.05
90%	-1	+4.1	+31	+55	+.09	+.2	+.02	-1	+5.4	+3	+14	-3	-.1	-13.61	+8	+.12	-.07	+.037	+18.52	+1.55	+13.06	+10.77	-1.77	+37.73
95%	-3	+4.7	+27	+49	+.07	+.0	-.15	-5	+4.3	+1	+11	-14	-.2	-17.82	+4	+.05	-.15	+.047	+15.58	-4.59	+9.69	+7.71	-3.94	+29.27
100%	-28	+13.1	-15	-12	-.09	-1.6	-1.62	-38	-4.6	-18	-15	-147	-2.4	-50.78	-36	-.67	-.75	+.153	-27.25	-49.79	-29.08	-35.72	-30.77	-52.38
Total Animals	**325,958**		**--------- 328,344 ---------**		**56,763**	**116,748**	**127,083**	**93,734**	**47,108**	**325,958**	**328,344**	**--- 81,088 ---**		**328,456**		**------------- 216,678 -------------**			**328,456**	**328,456**	**266,803**	**266,803**	**266,803**	**266,803**
Avg. EPD	**+4**	**+2.1**	**+43**	**+76**	**+.15**	**+.5**	**+.60**	**+9**	**+8.5**	**+8**	**+22**	**+29**	**+.3**	**+1.47**	**+22**	**+.40**	**+.27**	**+.006**	**+27.72**	**+21.10**	**+26.47**	**+22.33**	**+4.14**	**+61.45**

Spring 2014 EPD and $Value Percentile Breakdowns

NON-PARENT BULLS

	Production								Maternal			Carcass				$Values					
TOP PCT	CED	BW	WW	YW	RADG	YH	SC	Doc	CEM	Milk	$EN	CW	Marb	RE	Fat	$W	$F	$G	$QG	$YG	$B
1%	+15	-2.2	+66	+115	+.29	+1.2	+2.02	+31	+15	+36	+25.95	+54	+1.17	+1.12	-.048	+46.10	+61.92	+53.31	+43.92	+14.17	+104.52
2%	+14	-1.7	+64	+111	+.27	+1.1	+1.84	+29	+14	+35	+20.87	+51	+1.07	+1.03	-.041	+43.77	+57.70	+51.04	+41.95	+13.31	+100.79
3%	+13	-1.4	+63	+109	+.26	+1.1	+1.73	+28	+13	+34	+18.08	+48	+1.00	+.98	-.037	+42.35	+55.09	+49.47	+40.76	+12.79	+98.47
4%	+12	-1.1	+61	+107	+.25	+1.0	+1.66	+27	+13	+33	+16.08	+46	+.95	+.94	-.034	+41.36	+53.23	+48.22	+39.64	+12.37	+96.65
5%	+12	-.9	+61	+106	+.24	+1.0	+1.60	+26	+13	+33	+14.76	+45	+.92	+.90	-.031	+40.59	+51.63	+47.14	+39.02	+12.02	+95.16
10%	+11	-.3	+58	+101	+.22	+.9	+1.39	+23	+12	+31	+9.93	+40	+.79	+.79	-.022	+38.17	+46.41	+43.39	+35.70	+10.70	+90.03
15%	+10	+.2	+56	+98	+.21	+.8	+1.26	+21	+11	+29	+6.89	+36	+.71	+.71	-.016	+36.63	+43.04	+40.75	+33.86	+9.68	+86.40
20%	+9	+.5	+54	+95	+.20	+.7	+1.16	+19	+11	+28	+4.64	+34	+.65	+.66	-.012	+35.45	+40.39	+38.65	+32.04	+8.91	+83.39
25%	+8	+.8	+53	+93	+.19	+.7	+1.07	+18	+10	+27	+2.85	+32	+.61	+.61	-.008	+34.43	+38.05	+36.87	+30.74	+8.15	+80.79
30%	+8	+1.0	+52	+91	+.18	+.6	+1.00	+17	+10	+27	+1.23	+31	+.57	+.56	-.004	+33.52	+36.03	+35.34	+29.42	+7.47	+78.39
35%	+7	+1.3	+50	+89	+.18	+.6	+.93	+16	+9	+26	-.36	+29	+.53	+.52	-.001	+32.67	+34.15	+33.88	+28.40	+6.88	+76.20
40%	+7	+1.5	+49	+87	+.17	+.6	+.86	+14	+9	+25	-1.69	+28	+.50	+.48	+.002	+31.86	+32.28	+32.52	+26.99	+6.26	+74.12
45%	+6	+1.7	+48	+86	+.16	+.5	+.79	+13	+9	+24	-3.06	+26	+.47	+.45	+.005	+31.08	+30.51	+31.17	+26.23	+5.71	+72.12
50%	+6	+1.9	+47	+84	+.16	+.5	+.73	+12	+8	+24	-4.45	+25	+.44	+.41	+.008	+30.29	+28.74	+29.87	+25.10	+5.15	+70.10
55%	+5	+2.0	+46	+82	+.15	+.4	+.66	+11	+8	+23	-5.74	+24	+.41	+.38	+.011	+29.48	+26.99	+28.56	+23.81	+4.62	+68.15
60%	+5	+2.2	+45	+80	+.15	+.4	+.60	+10	+7	+22	-7.13	+23	+.38	+.34	+.014	+28.66	+25.25	+27.24	+23.06	+4.10	+66.10
65%	+4	+2.5	+44	+78	+.14	+.4	+.53	+8	+7	+22	-8.43	+21	+.36	+.30	+.017	+27.81	+23.37	+25.89	+21.90	+3.48	+64.05
70%	+3	+2.7	+43	+76	+.13	+.3	+.46	+7	+7	+21	-9.85	+20	+.33	+.27	+.020	+26.88	+21.37	+24.46	+20.55	+2.85	+61.83
75%	+3	+2.9	+41	+74	+.12	+.3	+.38	+6	+6	+20	-11.48	+18	+.30	+.23	+.023	+25.90	+19.19	+22.98	+19.30	+2.14	+59.30
80%	+2	+3.2	+40	+71	+.12	+.2	+.29	+4	+6	+19	-13.26	+16	+.26	+.18	+.027	+24.78	+16.57	+21.30	+17.91	+1.38	+56.53
85%	+1	+3.5	+38	+68	+.11	+.1	+.19	+2	+5	+18	-15.35	+15	+.22	+.13	+.032	+23.46	+13.63	+19.34	+16.01	+.48	+53.22
90%	+0	+3.9	+35	+64	+.09	+.1	+.06	-1	+4	+17	-17.99	+12	+.18	+.07	+.038	+21.72	+9.74	+16.91	+14.10	-.69	+48.85
95%	-2	+4.5	+31	+57	+.07	-.1	-.14	-5	+3	+15	-21.76	+8	+.10	-.02	+.047	+19.04	+3.54	+13.41	+10.77	-2.58	+41.78
100%	-22	+13.8	-6	-10	-.10	-1.9	-2.09	-30	-12	-15	-46.98	-44	-.52	-.54	+.135	-40.28	-50.05	-19.23	-25.93	-24.62	-66.24
Total Animals	**129,641**	**---------**	**135,826**	**---------**	**10,785**	**30,156**	**46,430**	**20,876**	**129,641**	**135,826**	**141,304**	**63,470**	**63,470**	**63,470**	**63,470**	**141,304**	**141,304**	**99,239**	**99,239**	**99,239**	**99,239**
Avg. EPD	**+5**	**+1.8**	**+47**	**+83**	**+.16**	**+.5**	**+.73**	**+11**	**+8**	**+24**	**-4.06**	**+25**	**+.46**	**+.42**	**+.008**	**+30.10**	**+28.30**	**+29.97**	**+24.95**	**+5.02**	**+69.56**

NON-PARENT COWS

TOP PCT	Production							Maternal			Carcass				$Values					
	CED	BW	WW	YW	RADG	YH	Doc	CEM	Milk	$EN	CW	Marb	RE	Fat	$W	$F	$G	$QG	$YG	$B
1%	+14	-2.1	+65	+113	+.27	+1.3	+32	+14	+36	+26.72	+54	+1.24	+1.20	-.050	+44.53	+58.88	+53.94	+44.26	+14.24	+105.47
2%	+13	-1.6	+63	+109	+.26	+1.2	+30	+14	+34	+21.62	+50	+1.15	+1.11	-.043	+42.42	+55.15	+51.70	+42.58	+13.37	+101.61
3%	+13	-1.3	+62	+107	+.24	+1.1	+28	+13	+34	+18.71	+48	+1.08	+1.05	-.039	+41.17	+52.87	+50.36	+41.36	+12.86	+99.23
4%	+12	-1.0	+61	+106	+.24	+1.0	+27	+13	+33	+16.75	+46	+1.04	+1.01	-.036	+40.30	+51.18	+49.25	+40.35	+12.45	+97.47
5%	+12	-.8	+60	+104	+.23	+1.0	+27	+13	+32	+15.26	+44	+1.00	+.98	-.033	+39.58	+49.82	+48.22	+39.64	+12.09	+95.97
10%	+11	-.2	+57	+100	+.22	+.9	+24	+12	+30	+10.41	+40	+.88	+.86	-.024	+37.44	+45.07	+44.27	+36.17	+10.75	+90.65
15%	+10	+.2	+55	+97	+.20	+.8	+21	+11	+29	+7.53	+37	+.79	+.78	-.018	+36.01	+41.88	+41.49	+34.09	+9.72	+86.87
20%	+9	+.5	+53	+94	+.19	+.7	+20	+11	+28	+5.24	+34	+.73	+.72	-.013	+34.88	+39.37	+39.32	+32.60	+8.99	+83.97
25%	+8	+.8	+52	+92	+.19	+.7	+18	+10	+27	+3.38	+33	+.67	+.66	-.009	+33.91	+37.12	+37.53	+31.05	+8.19	+81.31
30%	+8	+1.1	+51	+90	+.18	+.6	+17	+10	+26	+1.73	+31	+.63	+.62	-.005	+33.04	+35.15	+35.87	+29.77	+7.54	+78.90
35%	+7	+1.3	+50	+88	+.17	+.6	+15	+9	+26	+.23	+29	+.59	+.57	-.002	+32.24	+33.36	+34.41	+28.81	+6.98	+76.67
40%	+7	+1.5	+49	+87	+.17	+.6	+14	+9	+25	-1.20	+28	+.56	+.53	+.001	+31.45	+31.58	+32.99	+27.71	+6.36	+74.56
45%	+6	+1.7	+48	+85	+.16	+.5	+13	+9	+24	-2.51	+27	+.53	+.50	+.005	+30.67	+29.81	+31.66	+26.64	+5.83	+72.52
50%	+6	+1.9	+47	+83	+.16	+.5	+12	+8	+24	-3.81	+25	+.50	+.46	+.008	+29.90	+28.05	+30.33	+25.47	+5.25	+70.51
55%	+5	+2.1	+46	+81	+.15	+.5	+11	+8	+23	-5.18	+24	+.46	+.42	+.011	+29.12	+26.42	+29.05	+24.32	+4.69	+68.53
60%	+5	+2.3	+44	+80	+.14	+.4	+9	+7	+22	-6.56	+23	+.43	+.38	+.014	+28.31	+24.61	+27.75	+23.44	+4.19	+66.48
65%	+4	+2.5	+43	+78	+.14	+.4	+8	+7	+22	-7.98	+21	+.40	+.34	+.017	+27.47	+22.68	+26.38	+22.23	+3.54	+64.38
70%	+3	+2.7	+42	+76	+.13	+.3	+6	+7	+21	-9.36	+20	+.37	+.30	+.020	+26.59	+20.69	+24.99	+20.98	+2.93	+62.11
75%	+3	+2.9	+41	+73	+.12	+.3	+5	+6	+20	-11.00	+18	+.34	+.26	+.024	+25.64	+18.52	+23.52	+20.13	+2.27	+59.61
80%	+2	+3.2	+39	+71	+.11	+.2	+3	+6	+19	-12.74	+17	+.31	+.21	+.028	+24.53	+16.10	+21.89	+18.41	+1.56	+56.79
85%	+1	+3.5	+37	+68	+.10	+.2	+1	+5	+18	-14.89	+15	+.27	+.16	+.033	+23.23	+13.16	+20.02	+17.04	+.66	+53.44
90%	+0	+3.8	+35	+64	+.09	+.1	-2	+4	+17	-17.44	+12	+.22	+.09	+.039	+21.56	+9.28	+17.68	+15.13	-.50	+49.04
95%	-2	+4.4	+31	+57	+.07	+.0	-6	+3	+15	-21.07	+8	+.15	-.01	+.049	+18.96	+3.24	+14.34	+11.77	-2.36	+41.89
100%	-23	+12.7	-6	-18	-.01	-1.4	-32	-13	-11	-46.17	-39	-.38	-.55	+.127	-30.03	-54.57	-18.19	-17.16	-19.70	-31.53
Total Animals	**98,296**	**---------**	**103,094**	**---------**	**5,781**	**15,342**	**11,300**	**98,296**	**103,094**	**106,510**	**30,796**	**30,796**	**30,796**	**30,796**	**106,510**	**106,510**	**67,683**	**67,683**	**67,683**	**67,683**
Avg. EPD	**+5**	**+1.8**	**+46**	**+82**	**+.15**	**+.5**	**+11**	**+8**	**+24**	**-3.50**	**+26**	**+.52**	**+.47**	**+.008**	**+29.67**	**+27.47**	**+30.61**	**+25.48**	**+5.14**	**+69.96**

Angus Trait Heritabilities and Genetic Correlations

Trait	CED	BW	WW	PG	RADG	YH	SC	Doc	HP	CEM	Milk	MW	MH
Calving ease direct (CED)	**0.20**[1]	-0.69											
Birth weight (BW)		**0.42**											
Weaning weight direct (WW)			**0.20**	0.15[2]									
Postweaning gain (PG)				**0.20**		0.48[3]	0.28[3]						
Residual average daily gain (RADG)					**0.31**[4]								
Yearling height (YH)						**0.50**							
Scrotal circumference (SC)							**0.47**						
Docility (Doc)								**0.37**					
Heifer pregnancy (HP)									**0.13**				
Calving ease maternal (CEM)										**0.12**[5]			
Maternal milk (Milk)											**0.14**		
Mature weight (MW)												**0.37**	0.75
Mature height (MH)													**0.64**

[1]Heritability estimates are on the diagonal.

[2]Upper off-diagonals are genetic correlations.

[3]Genetic correlation between 365-day yearling weight and scrotal circumference or yearling height.

[4]Feed intake heritability.

[5]Maternal component only.

Genetic parameters for carcass traits are published at *Journal of Animal Science 2008,* 86:2518-2524.

Note: Symbols are used with a registration number to denote important information about an animal. An "F" following the symbol for a genetic condition means the animal has tested free of the condition. A "C" following represents a carrier of the condition, an "A" represents an animal that is affected, and a "P" represents an animal that is a potential carrier by pedigree. The status for a bull listed in this *Spring 2014 Sire Evaluation Report* represents the status of that animal as of **Dec. 6, 2013.**

Symbol	Meaning
#	Pathfinder cow or Pathfinder sire
+	Embryo transfer calf
^	Cell clone
%	Split-ET
@	Clone-ET
AM	Arthrogryposis multiplex
CA	Contractural arachnodactyly
D2	PRKG2 gene mutation for dwarfism
DD	Developmental duplication
DM	Double muscling
DW	Dwarfism
HG	Horn gene
HI	Heterochromia irides
M1	nt821 mutation for double muscling
NH	Neuropathic hydrocephalus
OS	Osteopetrosis
RD	Red
RTF	Produced 35 or more calves from daughters without a simple recessive genetic defect or genetic factor
SN	Syndactyly
WT	Wild type color gene
XC	Carrier of more than 1 defect
XF	Free of more than 1 defect

Accuracy and Associated Possible Change

The following table lists the possible change values associated with each expected progeny difference (EPD) trait at the various accuracy levels. Possible change is expressed as "+" or "-" units of EPD and can be described as a measure of expected change or potential deviation between the EPD and the "true" progeny difference.

This confidence range depends on the standard error of prediction for an EPD. For a given accuracy, about two-thirds of the time an animal should have a "true" progeny difference within the range of the EPD plus or minus the possible change value.

For example, a sire with an accuracy of 0.65 and birth weight EPD of +1.0 is expected to have his "true" progeny value falling within ±0.92 pounds (lb.) for birth weight EPD (ranging between 0.1 and +1.9) about two-thirds of the time.

With the conservative approach taken with respect to heritabilites in the Angus evaluation, actual EPD changes of animals within the population are much less than statistics would indicate.

ACCURACY AND ASSOCIATED POSSIBLE CHANGE

	Production								Maternal					Carcass			
Accuracy	CED	BW	WW	YW	RADG	YH	SC	Doc	HP	CEM	Milk	MW	MH	CW	Marb	RE	Fat
.05	7.8	2.49	11.0	16.2	.082	.41	.70	14.7	6.0	9.3	9.2	38	.62	18	.28	.31	.041
.10	7.2	2.36	10.4	15.3	.078	.39	.66	13.9	5.7	8.8	8.7	36	.58	17	.26	.29	.039
.15	6.7	2.23	9.9	14.5	.074	.37	.62	13.2	5.4	8.3	8.2	34	.55	16	.25	.27	.037
.20	6.2	2.10	9.3	13.6	.069	.35	.59	12.4	5.0	7.8	7.8	32	.52	15	.24	.26	.035
.25	5.8	1.97	8.7	12.8	.065	.32	.55	11.7	4.7	7.3	7.3	30	.49	14	.22	.24	.033
.30	5.4	1.84	8.1	11.9	.061	.30	.51	10.9	4.4	6.8	6.8	28	.45	13	.21	.23	.030
.35	5.1	1.71	7.5	11.1	.056	.28	.48	10.2	4.1	6.3	6.3	26	.42	12	.19	.21	.028
.40	4.7	1.58	7.0	10.2	.052	.26	.44	9.4	3.7	5.8	5.8	24	.39	12	.18	.19	.026
.45	4.3	1.44	6.4	9.4	.048	.24	.40	8.6	3.4	5.4	5.3	22	.36	11	.16	.18	.024
.50	3.9	1.31	5.8	8.5	.043	.22	.37	7.9	3.1	4.9	4.9	20	.32	10	.15	.16	.022
.55	3.5	1.18	5.2	7.7	.039	.19	.33	7.1	2.8	4.4	4.4	18	.29	9	.13	.15	.020
.60	3.2	1.05	4.6	6.8	.035	.17	.29	6.4	2.5	3.9	3.9	16	.26	8	.12	.13	.017
.65	2.7	.92	4.1	6.0	.030	.15	.26	5.6	2.2	3.4	3.4	14	.23	7	.10	.11	.015
.70	2.4	.79	3.5	5.1	.026	.13	.22	4.8	1.9	2.9	2.9	12	.19	6	.09	.10	.013
.75	2.0	.66	2.9	4.3	.022	.11	.18	4.1	1.6	2.4	2.4	10	.16	5	.07	.08	.011
.80	1.6	.53	2.3	3.4	.017	.09	.15	3.3	1.3	2.0	1.9	8	.13	4	.06	.06	.009
.85	1.2	.39	1.7	2.6	.013	.06	.11	2.6	1.0	1.5	1.5	6	.10	3	.04	.05	.007
.90	.8	.26	1.2	1.7	.009	.04	.07	1.8	.7	1.0	1.0	4	.06	2	.03	.03	.004
.95	.4	.13	.6	.9	.004	.02	.04	1.1	.4	.5	.5	2	.03	1	.01	.02	.002

Spring 2014 Breed Average EPD and $Values

	Production								Maternal						Carcass				$Values			
	CED	BW	WW	YW	RADG	YH	SC	Doc	HP	CEM	Milk	MW	MH	$EN	CW	Marb	RE	Fat	$W	$F	$G	$B
Current Sires[1]	+5	+1.7	+47	+84	+.16	+.5	+.73	+10	+8.6	+8	+23	+29	+.3	-2.94	+26	+.43	+.36	+.010	+30.77	+29.04	+27.80	+67.28
Main Sires	+6	+1.5	+49	+88	+.16	+.5	+.76	+11	+8.4	+8	+24	+26	+.3	-3.30	+27	+.44	+.37	+.012	+33.89	+33.31	+27.16	+67.94
Supplemental Sires	+6	+1.4	+52	+93	+.16	+.5	+.87	+12	+9.3	+8	+26	+33	+.3	-9.60	+31	+.46	+.47	+.013	+34.91	+38.41	+28.94	+74.71
Current Dams[1]	+4	+2.1	+43	+76	+.15	+.5	+.60	+9	+8.5	+8	+22	+29	+.3	+1.47	+22	+.40	+.27	+.006	+27.72	+21.10	+26.47	+61.45
Non-Parent Bulls	+5	+1.8	+47	+83	+.16	+.5	+.73	+11	+8.9	+8	+24			-4.06	+25	+.46	+.42	+.008	+30.10	+28.30	+29.97	+69.56
Non-Parent Cows	+5	+1.8	+46	+82	+.15	+.5	+.63	+11	+8.9	+8	+24			-3.50	+26	+.52	+.47	+.008	+29.67	+27.47	+30.61	+69.96

[1]At least one calf recorded in herd book within the past two years.