

# A PERFORMANCE HISTORY

BY MATHEW ELLIOTT

From a resilient start to becoming the industry leader in performance programs and information, American Angus Association Performance Programs have come a long way.

Before the late 1930s, the genetic progress of the Angus breed was determined not by scientific facts and information, but by the judge's opinion in the showring. The push toward performance testing cattle wasn't an easy one. The Association's first director of performance programs, Lyle Springer, was once quoted saying, "performance was a nasty word in the 1950s."

Some of the early performance tests were based only on the offspring of show winners. Other early indicators, like birth weight and average daily gain, are still in today's technology-driven performance world.

## AHIR

After much talk of performance testing, the Association's Board of Directors appointed a research committee in 1956. This committee recommended that a performance evaluation program be offered to the members of the Association. The committee then formed what would later become Angus Herd Improvement Records (AHIR®).

AHIR was a herd classification program that both physically categorized and gathered performance data on animals.

"The physical tool was included because up to that point beef improvement for ideal characteristics was done by eye," says John Crouch, American Angus Association chief executive officer (CEO) and former director of performance programs. "People looked for thicker, deeper, high-volume cattle that they thought would be more desirable for

*The American Angus Association turns 125 this fall. Recognition of the milestone will occur at various Angus events during the year. As part of the celebration, the Angus Journal will feature glimpses of the past throughout the year.*



the consumer. Show judges selected those types, too, and it was a prestigious thing to be awarded a championship ribbon.

"When AHIR came along, things became more objective — more about the numbers and science," he continues. "People viewed performance programs as being abnormal, saying these measurements did not identify good cattle."

Type classification was done by Association employees known as classifiers. These individuals would go to farms and ranches to evaluate both young and mature cattle. The individual rating (see page 77) scored animals on their frame, structural soundness, muscling, breed and sex character, and trimness. Within each of these categories, several characteristics were evaluated and ranked on a scale of 1 to 7, with 1 being the lowest and 7 being the highest. After ranking the characteristics, the animals were then rated excellent, very good, average, fair or undesirable.

In 1958 Lyle Springer was named the classification supervisor. The program was continued until 1977, when Iowa State

University's (ISU) Richard Willham's analysis of comparing classification scores and performance showed there was no relationship. The classification program was not entirely eliminated, but it was removed from AHIR and renamed the Angus Herd Analysis. However, the program was eventually dropped due to lack of producer interest.

AHIR then focused on measuring performance. Weaning weights (205 days), yearling weights (12 months) and average daily gain were all accounted for. In 1962 the Association purchased its first computer to help compile the data as volume began to increase, but it was a Board meeting in 1972 that got the ball rolling.

## Historic meeting

In Keith Evans' book *A Historic Angus Journey* he describes the March 1972 Board Meeting as "historic" and "the beginning of the Angus Enlightenment." Rightfully so. It was at this meeting that the Board lifted all restrictions on artificial insemination (AI) and approved the Angus National Sire Evaluation Program.

Previously, to register an AI-sired calf, the producer had to own the bull to collect semen and use it for AI. And once the bull was dead, his semen could no longer be used.

After a unanimous vote, the Board allowed bull owners to sell unlimited amounts of semen from their registered bulls and register as many AI-sired calves as they wished. A bull's frozen semen could be used after the bull was deceased; AI certificates that granted permission to register a calf were made transferable from

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## Beef Improvement Federation

Prior to 1968, no organization had looked at performance records. Frank Baker and Ferry Carpenter started standardizing performance records and soon after, the Beef Improvement Federation (BIF) was born.



In 2007 BIF celebrated 40 years of being at the forefront of cattle performance testing and evaluation.

BIF's goal is to standardize programs and methodology, and to create greater awareness, acceptance and usage of beef cattle performance concepts. The

organization's three-leaf clover-like logo represents the members of industry, Extension and research that work together to form the BIF.

"BIF played a tremendous role in standardizing beef cattle

performance testing procedures," says American Angus Association chief executive officer (CEO) and former BIF board member John Crouch. "In addition, it is a great forum for exchanging ideas, data and new technology. New committees have been formed through the years to study and develop these new technologies."

Several of BIF's milestones throughout the years included standardizing performance testing, the calculation of expected progeny differences (EPDs), standardizing and incorporating ultrasound data, and using DNA markers in genetic prediction.

BIF continues to meet on a yearly basis and conduct its annual meeting. The location varies and ideas continue to be exchanged through committee meetings and general sessions, which have helped to shape the beef industry as we know it.

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owner to owner; and progeny-testing was no longer mandatory for bulls used for AI.

This was a huge step for performance programs, as now a superior Angus bull could sire more sons and daughters in multiple herds to pass the quality genetics down through generations and eventually be measured against other Angus bulls to form expected progeny differences (EPDs).

At the same March Board meeting, the Board also approved a new concept to compare bulls — National Sire Evaluation.

### National Sire Evaluation

One of the most influential people in the Association's performance history was never a member of the staff or Board. Richard Willham, who contributed to both ISU's and Oklahoma State University's (OSU's) animal science programs, first visited the Association in 1963. Willham would later become an Association consultant and a trendsetter in Association programs.

Understanding both the new computing technology and cattle breeding, Willham put to use the techniques he used to compute the estimated breeding values (EBVs) used for AHIR. Presented as ratios, EBVs provided a method of predicting an animal's performance based on measurements taken on itself and its relatives.

While Willham was working on EBVs, the Beef Improvement Federation (BIF) was forming guidelines for within-breed across

herd comparison of bulls in a National Sire Evaluation. In 1971, the BIF guidelines for sire evaluation were passed. Soon after, National Angus Sire Evaluation based upon the new BIF guidelines was presented and passed at that "historic March Board meeting."

It was through this evaluation of bulls in different parts of the country and under different management styles that allowed comparison to "reference sires."

When compared to a reference sire, it was then possible to calculate EPDs.

To compare all available sires was no easy task for the AHIR program. Before sire evaluation, performance records were considered a breeder's personal property. The Association was not allowed legally to distribute them or to use the information in other performance programs without permission. A release form was created by the Association to make the AHIR records property of the Association. After a small amount of opposition, in 1975 most producers agreed and all AHIR records became the property of the Association.

The Association's first *Sire Evaluation Report* came out prior to the signing over of all information, but reference bulls were selected to be enrolled in spring 1972. The first cows were then bred to the bulls, and the calves were weaned in fall 1973. The feedlot results were released the next year and sent to every member with the November 1974 *Angus Bulletin* and available at the Association's 1974 Annual Meeting in Louisville, Ky.

The first report had EPD measurements for weaning weight, yearling weight, carcass cutability and carcass grade. Performance pedigrees based on the EPDs soon followed and were made available for \$2 per animal. With the Association's AHIR program pioneering the way for other breed associations, BIF named the American Angus Association the Performance Breed Association of the Year in 1975.

### Unprecedented growth

Through the 1970s there was a big push for larger-frame, Continental animals. Even with the established AHIR program, the Association was losing registrations and

tightening its budget. In 1977 Richard L. "Dick" Spader's position in public relations was eliminated, and Spader was named director of breed improvement. When Spader was promoted to executive vice president in 1981, he hired an Association regional manager, John Crouch, to direct the Performance Programs Department.

While growing up, Crouch was fascinated with the showing. "All I wanted to do was

play ball and show cattle," he recalls. But after graduating from the University of Tennessee and managing a commercial beef operation, he soon learned the value of heavier calves.

"When I was

making farm payments and managing that commercial operation, it was simple to see that the heavier calves were bringing more money," Crouch says. "It was at this early point that I found out performance was terribly important."

After spending time managing that commercial operation, Crouch was hired by the Association to be regional manager for Florida, Georgia and the Carolinas. His interest in cattle performance continued to grow, and he spoke with Angus producers about how they had to increase performance, starting by measuring traits. While working with the interested herds, Crouch enjoyed speaking with the producers about performance. Whether it was cow lines, bull growth or a calf's potential, he knew it was important to keep the producers interested in performance.

"We fought tooth and nail for every trait we could have measured," Crouch says. "We worked very hard to convince commercial producers and American Angus Association members what records could do."

Crouch was very active in performance programming, serving three terms as a member of the BIF board of directors, and speaking about cattle genetics and breeding throughout the U.S. and foreign countries.

While it was a large step in the right direction, up to 1985 the National Sire Evaluation could not compute EPDs for dams or young animals that did not have any progeny. The Association, as well as

### Performance Program directors

Lyle Springer	1959-1962
Stanley Anderson	1962-1971
Fred Francis	1971-1977
Richard "Dick" Spader	1977-1981
John Crouch	1981-2002
Bill Bowman	2002-present



►John Crouch was active in performance programs, serving three terms on the BIF board and speaking about cattle genetics throughout the U.S. and abroad. In 1993, he worked with ISU's Doyle Wilson to develop interim EPDs.

the rest of the beef industry, turned to the University of Georgia and its new computer. Georgia's computer was one of the most powerful in America, and the university allotted some time for beef cattle research.

When that happened, the National Sire Evaluation moved from ISU and became the National Cattle Evaluation (NCE). With the new computer technology, the Association could expand its calculations and include EPDs for bulls, cows and non-parent animals.

Angus breeders and commercial producers were now able to look at how much their animals varied from breed average. EPDs were not automatically included on Angus performance pedigrees or AHIR sheets. They were, however, included in herd listings and in the *Sire Evaluation Report*. It was not until 1987 that the Board decided to replace EBVs with EPDs on pedigrees.

EPDs continued to grow in popularity, and in 1989 the Association began running the NCE twice per year. When EPDs were first issued, there were two options for registration certificates. Regular certificates carried the pedigree and ownership information; for an extra \$1, members could purchase certificates that included performance information. It was 1991 when the fee was waived, and the regular certificates were discontinued. Today performance information and EPDs are included on all registration papers.

The EPDs that are on the current registration papers are divided into four categories — production, maternal, carcass and ultrasound — and include dollar value indexes (\$Values).

### Pathfinders

A program designed to identify superior cows using AHIR records was introduced in 1978 as the Pathfinder® Program. To become a Pathfinder, cows must reach puberty, breed and calve early; calve at regular intervals; and produce offspring that excel in performance.

It takes three calves before regularity of calving can be determined, so a cow cannot be named a Pathfinder until she has given birth three times. While once a Pathfinder always a Pathfinder, to be listed in the Association's annual published listing, a cow must have had a calf with AHIR records within the past 18 months and meet all the qualifications for Pathfinder status.

Bulls can also become qualified as a

► Early classification systems were used by Association classifiers to evaluate young and mature cattle.

Pathfinder Sire if the bull has sired five or more Pathfinder cows.

Pathfinders are distinguished with a # after the registration number.

Every spring the *Angus Journal* prints a report highlighting the outstanding females and bulls. Listed in the report is information on the cow, including owners and the performance information qualifying her as a Pathfinder. At the end of the report, the sires that qualify as Pathfinder Sires are listed with their information.

The qualifying Pathfinder Cow is listed along with her registration number and the number of calves she has raised with the average weaning weight ratio of the calves. In some situations, AHIR information from two or more herds is used in determining a Pathfinder status. This situation occurs when cows are transferred from one AHIR performance herd to another.

### The evolution of carcass evaluation

In the early days of performance testing during the 1960s, carcass data was collected, but the information was limited. Up to 1993, only sires that had completed structured sire evaluation could receive EPDs for carcass traits, and carcass information was not available on the progeny of these tested bulls.

It was in 1993 that ISU's Doyle Wilson and John Crouch developed an interim EPD

— an EPD that is calculated on animals during the time between the Association NCEs — that included percentages of the carcass EPDs from the sire, maternal grandsire and maternal great-grandsire. The ability to use pedigree estimates immediately provided interim carcass EPDs for dams and yearling cattle that had never been available before.

The initial interim carcass EPDs measured carcass weight, marbling score, ribeye area and fat thickness. Later, in 1996, a percent retail product EPD was added to predict the genetic potential for production of saleable beef in a carcass.

All of the carcass information that was being gathered provided a huge step in performance testing, but something was still missing. Progeny testing on live animals was needed to speed the generation interval and to enhance accuracy of the information. This led the Association to gather information on live animals with ultrasound equipment.

Ultrasound technology uses high-frequency sound waves to “look inside” the animal while it is still alive. This process is done by using a sound-emitting probe that is held on an animal. The sound waves bounce off the boundaries between the fat and muscle layers and a cross-section can be immediately viewed on screen and saved to a disc.

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In 1997, ISU emerged as an ultrasound leader. The Association supported studying the relationship between the carcass traits measured in the AHIR program and how they related to the ultrasound information. With this research grant, the Association also moved the NCE from the University of Georgia back to ISU.

According to *A Historic Angus Journey*, the goal of the ultrasound program was threefold:

1. To establish a uniform method of gathering and interpreting ultrasound measurements of body composition in live animals.

2. To estimate heritability and genetic relationships for and between these body composition traits.

3. To investigate the feasibility of incorporating ultrasound body composition measurements into the NCE.

The results from ISU's study showed that ultrasound could effectively measure

intramuscular fat (marbling), ribeye area and external fat cover on live yearling bulls and heifers.

As ultrasound measurements began to increase in popularity, the measurements taken by licensed operators, called ultrasound technicians, were sent back to ISU to be processed and evaluated. The first AHIR summaries to include ultrasound body composition measurements were released in 1998.

These summaries were not yet part of the *Sire Evaluation Report*, but were released in an *Ultrasound Body Composition Research Report*. The first report contained information on 2,156 sires, and the number of sires with ultrasound EPD information has continued to grow.

### Programs evolve out of performance

In the year 2000, a newly formed Commercial Relations Department joined the Association. This department soon

realized a need for performance records for commercial producers. A new program was formed called Angus Beef Record Service (BRS), which worked in tandem with AHIR records. Providing within-herd comparisons, BRS focused on summarizing information from conception to carcass, giving producers information to make breeding and marketing decisions based on fact rather than assumption.

With universities beginning to move away from single-breed cattle evaluations, the Association began looking for new ways to perform the NCE. In 2003 the NCE was moved once again, this time to the Association's headquarters in Saint Joseph, Mo. Sally Northcutt was hired as the genetic research director and began assisting with the NCE in-house.

The number of EPDs offered also continued to expand during this time, and \$Values were introduced in 2003. \$Values are multi-trait selection indexes, expressed

## EPD Terms

**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 on young animals when their performance has 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.

**Accuracy (ACC)** is the reliability that can be placed on the EPD. An accuracy of close to 1.0 indicates higher reliability. Accuracy is affected by the number of progeny and ancestral records included in the analysis.

**\$Value Indexes** 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.

### PRODUCTION

**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.

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

**Scrotal Circumference EPD (SC)**, expressed in centimeters, is a predictor of the difference in transmitting ability for scrotal size compared to that of other sires.

### MATERNAL

**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)** 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.

**Herds (MkH)** indicates the number of herds from which daughters are reported.

**Daughters (MkD)** reflects 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

in dollars per head, to assist beef producers by adding simplicity to genetic selection decisions. The \$Values started with beef (\$B), feedlot (\$F) and grid (\$G) values, and later expanded to include weaned calf (\$W) and cow energy (\$EN). In 2004 the \$Values were included on both registration papers and pedigrees.

Along with the \$Values, there were several other new EPDs being studied. Calving ease direct (CED) and calving ease maternal (CEM) EPDs were introduced in 2004. In 2006, research projects in the areas of heifer pregnancy and stayability began, followed soon after with a study of docility. As a result, heifer pregnancy and docility EPDs were introduced as research evaluations in 2007.

2007 also brought about the formation of Angus Genetics Inc. (AGI). AGI is a subsidiary of the Association and offers genetic evaluation services, including the Association's in-house NCE, to entities in the beef industry.

### Technology continues to grow

When the Association purchased its first computer in 1962, no one would have guessed how much the computer would eventually change the way nearly everything is managed. From computers that required an engineer and a climate-controlled room to the Internet on cellular phones, technology has drastically changed how the Association receives and processes information and how producers view it.

Bill Bowman, who began working for the Association as a regional manager in 1992 and then as director of the commercial program in 1998, took the reigns as director of performance programs in 2002 when John Crouch was promoted to executive vice president.

"My primary role then evolved," says Bowman, who worked closely with Crouch before his promotion. "I assisted John with some of the communications and giving performance talks to producers and became

more involved in the daily performance flow of the position."

"I don't think most producers know how fast things have changed here," Bowman says. "Not too long ago, very few people were using computers to send in performance data. Through March 2008, 84% of the yearling weights have been directly uploaded and sent into the Association electronically. It continues to amaze us how the efficient flow of data has dramatically changed."

Performance programs will continue to evolve within the Association. With increased technology and understanding of genetics, genomics, enhancing EPDs and cattle performance, each Board of Directors will study which new technology could be the next significant breakthrough in improving tools utilized in the selection process.



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

**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)** is expressed as a fraction of the difference in USDA marbling score 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 (Grp/Pg)** reflects the number of contemporary groups and the number of carcasses for each sire included in the analysis.

### \$VALUE INDEXES

**\$Value indexes** 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.

**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 and ultrasound-derived percent intramuscular fat (%IMF) EPD contribute 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.

**Source:** American Angus Association.