



# By the Numbers

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## Angus HP EPDs available weekly

One of the American Angus Association's research initiatives is to characterize reproductive traits in the Angus breed. It's perhaps the most difficult class of traits in terms of creating genetic values. Yet, in a beef production system, the economic importance of reproductive success is vital. Seedstock and commercial producers continually ask about the availability of reproductive selection tools to improve their herds. A large breeding record database, particularly on heifers, enhances the ability to develop genetic predictions, such as expected progeny differences (EPDs) and indexes, for the reproductive complex.

In June 2011, the Association's Board of Directors approved the full release of heifer pregnancy (HP) EPDs as part of the weekly National Cattle Evaluation (NCE). Angus producers are submitting breeding records electronically as part of their performance data, either through AAA Login or Angus Information Management Software (AIMS). The following summary outlines the new EPD.

### Evaluation procedures and edits

Each week, 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. Heifers are excluded from the analysis if their age at the time of the evaluation did not allow them time to have recorded a calf.

Edited data on heifers are analyzed in a threshold analysis with a full-animal model and three-generation pedigree. Variance components were used in the analysis

representing a heritability of 0.13, and these genetic parameters were computed from the Association's database in collaboration with Colorado State University.

The heifer contemporary group is defined as breeding herd, breeding year, season and synchronization code. Data edits include the removal of any contemporary groups with no variation (0% pregnant or 100% pregnant). Already, the weekly analysis represents more than 800 contemporary groups from nearly 400 herds.

### Results

EPDs generated on June 27, 2011, represent 72,662 animals, as described in Table 1.

In evaluating the genetic trend for heifer pregnancy, the average HP EPD by animal birth year has remained unchanged over time. The genetic trend line is flat, and no trend has occurred for heifer pregnancy based on this initial analysis as would be expected in situations where little selection pressure has been applied to heifer pregnancy rates.

### Angus EPD layout

The HP EPDs are available on the Association's website ([www.angus.org](http://www.angus.org)) through EPD Pedigree Lookup, as well as individual breeder AAA Login accounts. The new HP EPD appears in the maternal trait section (see Fig. 1) heading just before the calving ease maternal (CEM) EPD. A BIF accuracy (*Beef Improvement Federation Guidelines 2010*, Ninth edition) is provided for HP EPD, as well as for the other Angus EPDs provided through the Association.

If an interim HP EPD appears for an animal, this is computed as half the sire and half the dam EPD and assigned a 0.05 default accuracy value. In the event that either or both parents do not have a weekly NCE HP EPD, the HP EPD will not be provided as an interim. No interim EPDs are provided for any trait where a parent has interims.

### Use of HP EPDs

HP EPDs are to be used as a tool to increase the chance of a sire's daughters becoming pregnant during a normal breeding season. The unit of measure for the EPD is a percentage. A higher EPD is

Fig. 1: Display of heifer pregnancy (HP) EPD on [www.angus.org](http://www.angus.org)

Production								Maternal							
CEM Acc	BW Acc	WW Acc	YW Acc	RADG Acc	YH Acc	SC Acc	Doc Acc	HP Acc	CEM Acc	Milk Acc	MkD	MW Acc	MH Acc	\$EN	
+14	-1.3	+54	+99	+11	-1	+1.74	+22	+1.2	+12	+25	1500	+33	+3	+3.84	
.96	.99	.98	.97	.81	.97	.97	.94	.76	.91	.94	6208	.90	.90		

Carcass					
CW Acc	Marb Acc	RE Acc	Fat Acc	Carc Grp Carc Pg	Usrd Grp Usrd Pg
+23	+64	-.07	+.015	49	6709
.76	.79	.78	.78	106	20512

\$Values					
\$W	\$F	\$G	\$QG	\$YG	\$B
+41.61	+36.68	+26.16	+28.20	-2.04	+56.22

Table 1: Descriptive statistics for heifer pregnancy genetic evaluation

No. of heifer breeding records	29,747			
No. of contemporary groups	847			
No. animals with EPDs	72,662			
	<u>Mean</u>	<u>SD</u>	<u>Min.</u>	<u>Max.</u>
Mean EPD <sup>a</sup>	7.9	3	-6	15
Mean Accuracy	.20	.20	.05	.86

<sup>a</sup>Sires (n = 2,430).

the more favorable direction for selection pressure. As with other EPDs, the relative difference among sires is of importance rather than the absolute value.

Fig. 2 provides an example of the use of HP EPDs. Assume there are 100 daughters for each of the two bulls, managed and treated alike in the same breeding environment. When comparing the two bulls, one would expect an average of five more pregnant daughters out of 100 from Bull A compared with Bull B. Essentially Bull A's daughters have a 5% greater chance of becoming pregnant than Bull B's daughters.

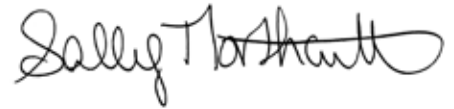
**Fig. 2: HP EPD example**

Bull A	+13%
Bull B	+8%
Difference	5%

### Summary

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

EPDs and accuracies are available on the Association's website and through breeder AAA Login accounts. To learn more about submitting heifer breeding records electronically to receive the HP EPDs, please contact the Association at 816-383-5100.



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**Editor's Note:** "By the Numbers" is a column by Association performance programs staff to share insights with Angus members about data collection and interpretation, the National Cattle Evaluation (NCE), genetic selection, and relevant technology and industry issues. If you have questions or would like to suggest a topic for a future column, contact Sally Northcutt, director of genetic research, or Bill Bowman, director of performance programs, at 816-383-5100.