

Beef Cattle Breeding Project Progress Report: Growth-Trait EPDs for 1998- and 1999-Born Calves

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The objective of the present report is to summarize growth trait EPDs of bulls and heifers born during the 1998 and 1999 birth years.

Introduction

The Iowa State University beef cattle breeding project was designed to develop two selection lines of beef cattle for use as a research base to answer questions that influence genetic improvement. The project was started in 1996 and is being conducted at the Rhodes (central Iowa) and McNay (southern Iowa) research and demonstration farms.

The specific objectives of the project are:

- 1) To estimate genetic and environmental parameters for economic characteristics from the analyses of AAA data coupled with analyses of the Angus sample, the two-line selection experiment for high quality and increased retail product, and the search for quantitative trait loci (QTL),
- 2) To validate the use of ultrasound on live cattle to make genetic change in the body composition traits of external fat cover, ribeye area, percentage intramuscular fat (marbling), percent retail product, and total retail product, and
- 3) To develop and evaluate new ultrasound methods to measure other quality and retail product traits on live cattle and carcasses.

The two selection lines include:

Quality line (Q): designed to study the genetics of beef quality traits. Next generation parents are being selected based on ultrasound-predicted percentage of intramuscular fat measures.

Retail line (R): designed to study the genetics of retail product. Next generation parents are being selected based on ultrasound ribeye measures.

Materials and Methods

Data for this report came from bulls and heifers born during the spring of 1998 and 1999 at the Rhodes and McNay research and demonstration farms. Progeny belong to two selection lines: the Quality or the Retail line.

After weaning, progeny were fed the medium-energy ration to allow a mean weight gain of 3 –3.5 lbs /day in bulls and 1.5 to 2.5 lbs /day for heifers. Starting at an age of 180 to 269 days, bulls and heifers were serially scanned 4 to 7 times for fat cover, ribeye area, percentage of intramuscular fat, and rump fat thickness. In addition, body weight and hip height were measured at each scan session. In each of these years birth weight, weaning weight, yearling weight, and yearling hip height data were submitted to the American Angus Association for genetic evaluation.

Results

Mean EPDs of bulls and heifers for growth traits are shown in Tables 1 and 2, respectively. Means were calculated based on results from the spring 2001 National Cattle Evaluation program of the AAA. Progeny in both lines averaged close to the mean breed EPDs of their respective birth years. Because the project is in its early stages of development, possible correlated genetic differences for growth traits between the two lines are not expected at this time.

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Table 1. Mean EPDs of project bulls by year and selection line.

Trait	Line	Year	n	Mean	SD	Min	Max	Mean Accuracy	
BWT	Q	1998	39	2.53	1.64	-1.30	6.20	0.41	
		1999	44	2.54	1.29	-0.50	4.90	0.37	
	R	1998	36	2.29	1.56	-1.20	5.30	0.41	
		1999	38	2.49	1.63	-1.10	6.30	0.37	
	Breed average for 1998-born				2.64	1.68	-5.80	11.80	0.37
	Breed average for 1999-born				2.64	1.66	-8.70	13.20	0.33
WWT	Q	1998	39	30.64	5.29	21.00	43.00	0.40	
		1999	44	28.98	5.12	13.00	38.00	0.37	
	R	1998	37	29.76	5.17	19.00	41.00	0.39	
		1999	38	29.11	6.50	14.00	45.00	0.36	
	Breed average for 1998-born				29.64	8.31	-34.00	90.00	0.36
	Breed average for 1999-born				30.88	8.28	-30.00	85.00	0.32
Milk	Q	1998	39	16.46	4.90	6.00	26.00	0.33	
		1999	44	17.98	4.98	8.00	29.00	0.32	
	R	1998	37	15.41	4.90	6.00	26.00	0.34	
		1999	38	14.74	5.13	4.00	23.00	0.32	
	Breed average for 1998-born				14.20	5.62	-14.00	40.00	0.31
	Breed average for 1999-born				14.97	5.42	-10.00	37.00	0.26
YWT	Q	1998	39	56.92	7.82	43.00	76.00	0.32	
		1999	44	55.20	9.69	33.00	70.00	0.30	
	R	1998	37	57.84	9.91	44.00	77.00	0.32	
		1999	38	56.79	12.13	17.00	79.00	0.29	
	Breed average for 1998-born				54.65	14.64	-54.00	144.00	0.26
	Breed average for 1999-born				57.06	14.42	-48.00	143.00	0.21

Table 2. Mean EPDs of project heifers by year and selection line.

Trait	Line	Year	n	Mean	SD	Min	Max	Mean Accuracy	
BWT	Q	1998	68	3.13	1.66	-3.20	6.60	0.60	
		1999	32	2.58	1.14	0.20	4.70	0.38	
	R	1998	71	2.96	1.79	-1.40	7.00	0.61	
		1999	36	2.22	1.55	-1.30	6.10	0.37	
	Breed average for 1998-born				2.64	1.68	-5.80	11.80	0.37
	Breed average for 1999-born				2.64	1.66	-8.70	13.20	0.33
WWT	Q	1998	68	32.62	5.56	15.00	46.00	0.56	
		1999	32	31.25	4.46	21.00	43.00	0.37	
	R	1998	71	32.56	6.25	21.00	44.00	0.57	
		1999	36	28.92	5.53	17.00	40.00	0.36	
	Breed average for 1998-born				29.64	8.31	-34.00	90.00	0.36
	Breed average for 1999-born				30.88	8.28	-30.00	85.00	0.32
Milk	Q	1998	68	17.97	5.17	7.00	29.00	0.54	
		1999	32	17.16	5.13	6.00	27.00	0.32	
	R	1998	71	16.85	5.76	0.00	27.00	0.54	
		1999	36	15.92	4.46	10.00	26.00	0.31	
	Breed average for 1998-born				14.20	5.62	-14.00	40.00	0.31
	Breed average for 1999-born				14.97	5.42	-10.00	37.00	0.26
YWT	Q	1998	68	62.10	9.41	36.00	84.00	0.54	
		1999	32	59.22	6.74	46.00	78.00	0.30	
	R	1998	71	63.59	9.82	41.00	92.00	0.55	
		1999	36	55.42	8.73	35.00	75.00	0.29	
	Breed average for 1998-born				54.65	14.64	-54.00	144.00	0.26
	Breed average for 1999-born				57.06	14.42	-48.00	143.00	0.21