

What's POSSIBLE

Basic statistical analysis guides a Maryland breeder on his quest for high marbling.

by **Steve Suther**



Dean Bryant's background in research at Purdue University and Wye Angus met with a challenge to aim for the high-marbling Angus target when he became manager of Roseda Farm, Monkton, Md.

The result has been the generation of a line of herd sires consistently in the top 5% of the breed for marbling while keeping other traits in balance. In addition, Bryant developed a network that has leveraged Roseda's 125-head registered core herd into nearly 2,000 cows by working with commercial Angus herds on a buyback program.

After visiting the Certified Angus Beef LLC (CAB) headquarters in June, Bryant is looking into further developing that network to include a relationship with a CAB-licensed feedlot. However, he says the impetus for orienting toward high marbling was the desire to market high-quality Angus beef in the Baltimore area and to provide genetics to cattle producers with similar goals.

"The first question we had was 'how far can we go?' It's one thing to say you're going to emphasize carcass, but you have to know the upside potential," Bryant says. "We don't single-trait select on marbling — it's very important that we use selection indexes based on the economics of all traits."

That said, Bryant looked at steer data in an Angus *Sire Evaluation Report* and saw two numbers that told his practiced statistical eye what was possible. "The average marbling score of those steers was 5.92, and the standard deviation was 0.96," he notes. "It's awful easy just to breeze through that, but what does it mean?"

If you think about a bell curve, the middle is the 5.92 average and standard deviations should be marked off so that two-thirds of the cattle fall either 0.96 above or below the average. In this case, that means between a 4.96 and a 6.88 marbling score.

"Those are still just numbers, but you can apply a few more formulas and predict the range of quality grades for the steers," Bryant says. "To take that a little bit further, we have to make some assumptions — that steers were from average-marbling-EPD (expected

progeny difference) Angus dams, by average Angus bulls, so the steers' EPD also would be 0.05." Breaking marbling scores down into quality-grade distribution, he determined the steers could achieve 46.6% CAB acceptance (see Fig. 1).

"What happens if we use the top marbling bulls of the breed?" Bryant wondered. At the time, that EPD level was about 0.8. "If we use

the same cows but bulls with a marbling EPD of 0.8, we get a jump to 8.1% Prime with 75% CAB [specifications are average-Choice or higher].

"We take the female counterparts to these steers that had a marbling EPD of 0.42, and there's the base for our next generation. You can see we get up to 0.61. We add the next generation, doing the same thing, and get up to 0.70. Eventually, with a breeding program like this, you stabilize and breed 0.8 bulls and 0.8 heifers," Bryant projects.

"Our conclusion is there is a tremendous opportunity in a breeding program to improve where we are," he says. "There is no sense in breeding if you can't improve."

Taking projected EPDs on steers and the corresponding breakdown of expected U.S. Department of Agriculture (USDA) quality grades, Bryant "did a little bit more math" and created a table to predict grade distribution for a range of steer marbling EPDs (see Table 1).

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Fig. 1: Dean Bryant's normal bell curve distribution of steers expected to fall within one, two and three standard deviations (SD) of the breed average marbling EPD score of 5.92 and a SD of 0.92

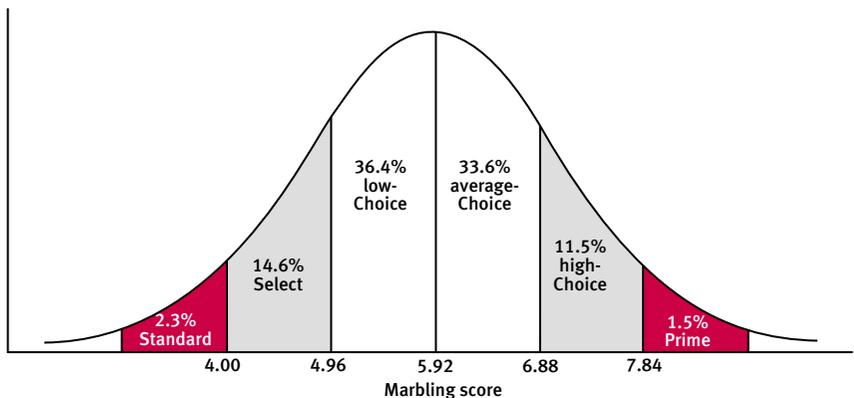


Table 1: Dean Bryant's table to predict carcass grade distributions at various levels of marbling expected progeny differences (EPDs)

Steers' marbling EPD	Avg. marbling score	% Prime	% high-Choice	% avg.-Choice	% low-Choice	% Select	% Standard
-0.2	5.42	0.4	4.6	22.3	39.6	26.1	7.0
-0.1	5.62	0.7	6.9	27.1	39.5	21.3	4.6
0.05*	5.92*	1.5	11.5	33.6	36.4	14.6	2.3
	±0.96*						
0.1	6.02	2.0	13.4	35.5	34.8	12.6	1.8
0.2	6.22	3.2	17.6	38.2	30.7	9.2	1.0
0.3	6.42	5.0	22.3	39.6	26.1	6.4	0.6
0.4	6.62	7.5	27.1	39.5	21.3	4.3	0.3
0.5	6.82	11.0	31.6	37.8	16.8	2.7	0.2
0.6	7.02	15.4	35.5	34.8	12.6	1.7	0.1
0.7	7.22	20.8	38.2	30.7	9.2	1.0	0.0
0.8	7.42	27.3	39.6	26.1	6.4	0.6	0.0
0.9	7.62	34.6	39.5	21.3	4.3	0.3	0.0
1.0	7.82	42.6	37.8	16.8	2.7	0.2	0.0

*Base-population assumptions used to calculate distributions for other marbling EPDs.

“Angus breeders can see what can happen if you shoot for slightly positive marbling, that 0.1 to 0.2 range,” Bryant says. “If you want to select for a little higher marbling, you can do that, too, and see the projected results. Remember, use this with selection indexes based on economics of all traits.”

Does it work?

“The tail end of our calf crop last year graded 64% CAB and Prime, 93% low-

Table 2: Comparison of Roseda steers with expectations from Table 1

	Marbling EPD	% Prime	% upper 2/3 Choice	% low- Choice	% Select
Roseda steers	0.33	7.0	57.0	29.0	7.0
Expected from Table 1	0.3	5.0	61.9	26.1	6.4

Choice or better, 71% Yield Grade (YG) 1 and 2, and no steers higher than a 3.6. The marbling EPD on these steers was 0.33,” Bryant says (see Table 2). “We went back to

the chart and looked at the 0.3 steers. You can see it's very close — easily within statistical error.”

