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Relationship between expected progeny differences (EPD) and performance of Angus and Simmental bulls in central bull tests

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RELATIONSHIP BETWEEN EXPECTED PROGENY DIFFERENCES (EPD) AND PERFORMANCE OF ANGUS AND SIMMENTAL BULLS IN CENTRAL BULL TESTS

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Summary

The performance of bulls (n = 656 for Angus and n = 1343 for Simmental) at the Beloit and Potwin bulls tests from 1989 to 1992 were compared to their expected progeny differences (EPDs). In general, correlations between on-test ADG and weaning and yearling EPD were low for both breeds. However, the correlations between actual yearling weight and yearling EPD was moderate for Angus. Differences in actual yearling weight were 2.80 and 1.71 pounds (for Angus and Simmental, respectively) for each pound of difference in yearling weight EPD, which is close to the 2.0 pound difference expected. Thus, although the relationship between EPDs and average daily gain on test was not strong, EPDs did a good job of predicting differences in weight at a standardized age.

(Key Words: Bull Tests, Expected Progeny Differences.)

Introduction

The addition of expected progeny differences (EPDs) to the information provided to bull buyers at the Beloit and Potwin bull tests has raised many questions concerning the relationships between actual performance of the bulls and their EPDs. These questions have been particularly prevalent with bulls that have had high EPDs for growth and haven't expressed good growth, or vice versa. These circumstances have created problems for producers in determining what information should be emphasized in selecting bulls. This study was conducted to determine the relationships between actual bull performance and EPDs in order to assist producers in answering these questions.

Experimental Procedures

The data analyzed in this study were collected from the Beloit and Potwin bull tests conducted from 1988 through 1992 - a total of 13 tests. Only the Angus and Simmental breeds were analyzed, because there were inadequate numbers of bulls in other breeds to provide meaningful comparisons. The two breeds were analyzed separately, because their EPDs have different base years. To avoid differences between tests in performance because of weather, etc., the data were standardized for test differences in performance prior to analysis. The EPDs utilized in the analysis were those published in the final test report and were pedigree or interim estimates provided by the respective breed associations. These estimates took into account the actual birth and weaning weights but not the actual yearling weights of the bulls.

Results and Discussion

The correlations between the EPDs for Angus bulls and their performance on test and other descriptive information are shown in Table 1. Because a large number of bulls was included in this analysis, almost all of the correlation coefficients are statistically significant; however, the relationships between actual performance (ADG on test) and growth EPDs, i.e., weaning and yearling, were much lower than expected. For example, the correlation between average daily gain and yearling EPD was only .13. Conversely, the

relationship between actual yearling weight and yearling EPD was .30. This result is logical when one considers that average daily gain on test is influenced by prior nutritional regimes, disease, age on test, etc., whereas absolute yearling weight tends to eliminate some of this variation between bulls.

The correlations for the Simmental bulls are shown in table 2. The relationships between traits are similar to those in Angus with the exception of yearling weight EPD, which exhibited a lower correlation with actual yearling weight and weight-per-day-of-age. Again, the general relationships were much lower than expected.

For each pound difference in yearling EPD, the actual adjusted yearling weights changed 2.80 and 1.71 pounds in Angus and Simmental, respectively. These results are reasonably close to the expected value of 2.0 pounds per pound change in the EPD, and provide proof that, on average, EPDs do predict genetic differences.

Table 1. Simple Correlations between Expected Progeny Differences (EPD) and the Performance of 656 Angus Bulls for 1988-92 at the Beloit and Potwin Bull Tests

	Expected progeny differences				
Item	Birth weight	Weaning weight	Yearling weight	Maternal weaning weight	Milk
Final wt.	.27***	.34***	.36***	.22***	.08
ADG	.12**	.10**	.13**	.11**	.04
Birth wt.	.49***	.24***	.19***	.19***	.15***
Weaning wt. ratio	.12**	.31***	.02	.24***	.09*
Weight per day of age	.25***	.31***	.26***	.23***	.11**
Index	.19***	.20***	.20***	.17***	.08*
Yearling wt.	.21***	.36***	.30***	.28***	.15***

*P < .05, **P < .01, ***P < .001.

Table 2. Simple Correlations between Expected Progeny Differences (EPD) and the Performance of 1343 Simmental Bulls for 1988-92 at the Beloit and Potwin Bull Tests

	Expected progeny differences				
Item	Birth weight	Weaning weight	Yearling weight	Maternal weaning weight	Milk
Final wt.	.13***	.32***	.15***	.07**	.30***
ADG	.11***	.20***	.16***	.18***	.06*
Birth wt.	.61***	.17***	.12***	.18***	.08**
Adj. weaning wt.	.11***	.36***	.08***	.39***	.17***
Weight per day of age	.14***	.38***	.17***	.40***	.17***
Index	.13***	.29***	.17***	.29***	.11***
Yearling wt.	.16***	.37***	.17***	.35***	.11***

*P < .05, **P < .01, *** P < .001.