Staying Power

CSU looks at developing a breeding value for stayability in cows.

Story & photo by **Shelby Mettlen,** *assistant editor, Angus Media*

A cow needs to remain in production long enough to generate revenue to offset the costs of her development and maintenance, explained Scott Speidel, assistant professor of animal science at Colorado State University (CSU). Speidel explained the significance of stayability and random regression in the cow herd during a June 1 breakout session focused on efficiency and adaptability at the 2017 Beef Improvement Federation (BIF) Symposium in Athens, Ga.

Speidel defined stayability as the probability of a beef cow surviving to a specific age, given that she's had the opportunity to stay in that herd.

In partnership with the Red Angus Association of America, Speidel and his CSU colleague Mark Enns have been working to determine the effects of "alternate definitions of stayability" in conjunction with new models of genetic evaluation.

► Scott Speidel, assistant professor of animal science at Colorado State University, explained the significance of stayability during a breakout session.

Traditionally evaluated within-breed, stayability is not a trait that proves particularly simple to determine, specifically because of differences in definition across breeds. The CSU program aims to improve the quality of data submitted to the breed association, and to generate more accurate expected progeny difference (EPD) values, especially in female traits like stayability and heifer pregnancy, Speidel explained.

He calls stayability "one of a class of traits that presents some unique challenges" when conducting a breed-wide genetic evaluation.

Bulls are 8 years of age before they have daughter progeny with stayability records. Stayability to 6 years of age proved to be heritable, Speidel observed. That posed the question: Is it heritable in younger animals?

To arrive at what Speidel calls an "aggregate stayability prediction," he performs four genetic evaluations — one each for stayability at 3, 4, 5 and 6 years of age. The EPD values and associated accuracies for the animal are combined to determine the aggregate prediction.

A perfect correlation for stayability is 1, with calculated values ranging from about 0.5 to a little more than 0.8.

Another factor in stayability, random regression, tends to be less sensitive to end-point definition, Speidel pointed out. While most EPDs are determined using one specific trait, like weaning weight or birth weight, random regression combines those values to predict an animal's genetic merit over time. It results in more informative data usage and greater accuracy, he said.

In the future, developing values for stayability and using random-regression calculations will help the data bank for cattle breed associations grow. The random-regression behaviors are indicative of data density, Speidel said, and the amount of data included can stabilize predictions.

Table 1: Genetic relationship of stayability at 3, 4 and 5 years of age relative to 6 years of age

	Stay3	Stay4	Stay5	Stay6
Stay3	0.10	0.84	0.46	0.49
Stay4		0.11	0.85	0.70
Stay5			0.11	0.60
Stay6				0.11

Heritabilities on the diagonal. Correlations on the off diagonal.

Source: Scott Spiedel, Advancements in Efficiency and Adaptability breakout session, 2017 BIF Symposium, Athens, Ga.