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21ST CENTURY GENETICS: RISING TO THE CHALLENGE SOUTHERN STYLE

Heterosis: Ignored or Forgotten?

by Troy Smith

CHOCTAW, MISS. (April 20, 2006) — According to rancher and California State University-Chico animal scientist Dave Daley, many cattle producers have ignored or forgotten about the value of heterosis. While University educators and industry leaders have talked much about the advantages of planned crossbreeding programs for nearly 50 years, Daley said he fears they haven't communicated very well.

He made his comments during Thursday's general session at the 2006 Beef Improvement Federation (BIF) annual research symposium in Choctaw, Miss.

"The industry has done a lousy job of applying heterosis effectively," Daley said. "For some reason, poultry and pork have seemed to figure out how to take advantage of genetic diversity and produce a consistent product. The beef industry has not done so on a wide-spread basis."

Yet the evidence is clear, overwhelming and consistent, Daley added, citing studies showing how breeding programs designed to capture direct and maternal heterosis can increase lifetime cow productivity by more than 20%. The small, net positive effects on many traits contribute to a large, net positive cumulative effect for the long term.

Daley offers 10 reasons why heterosis is ignored or forgotten:

- ▶ Cultural bias reflects "purebreds are better", if for no other reason than they have registration papers. There is value in registries, particularly in the ability to track performance and predict genetic potential of purebreds, but being purebred should not be a presumption of superiority.

- ▶ There is a tendency toward single trait selection and the mind-set of "bigger is better." The subtle and cumulative improvement from heterosis does not lend itself to maximums.
- ▶ We have decided that measuring outputs is more meaningful than measuring inputs. It's easier to measure production than the costs of production.
- ▶ Uniform phenotypes for qualitative traits (color) have a distinct marketing advantage. It is easier to produce uniform color in straightbred programs, but that does not mean you cannot have uniform color within a crossbreeding program.
- ▶ Heterosis is difficult to visualize and even more difficult to measure. Small improvements in morbidity, age at puberty, conception rate and significant changes in longevity are not easily observed.
- ▶ Complicated crossbreeding programs are difficult to implement, particularly in small herds.
- ▶ We have tried to modify or enhance the environment to increase production rather than focusing on how to increase net return by making cattle fit the environment.
- ▶ Historically, there has been resistance to crossbreeding from some marketing outlets, purebred breeders and breed associations.
- ▶ Poor planning of the combination of breeds and selection within breeds has led to inappropriate use of breed diversity.
- ▶ Industry and university systems have focused on individual trait measurement for more than 50 years. We now need measures of in-



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"The industry has done a lousy job of applying heterosis effectively," said Dave Daley, California State University, Chico.