

Genetic Analyses of Feed Intake, Feed Efficiency, Female Fertility, and Cow Lifetime Productivity in Beef Cattle Raised in Two Environments

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Background: Feed efficiency, feed intake, production performance, and fertility are major determinants of sustainable beef production. Understanding genetic correlations among these traits is crucial for optimizing multiple trait selection indices that improve calf crop percentage and sustainability.

Goal: to optimize a multiple trait selection index for replacement heifers to reduce production costs and increase sustainability of beef production

Objectives: development of a genomic selection tool for improved feed efficiency while maintaining or improving heifer/cow reproductive performance.

- 1) Estimate genetic and phenotypic correlations of dry matter intake and feed efficiency with heifer fertility, longevity and lifetime productivity of cows reared under two winter feeding systems (higher vs. lower inputs)
- 2) Determine the relationships of mature cow DMI per weight of calf weaned over 3 and 6 calvings with heifer performance
- 3) Predict heifer fertility and cow lifetime productivity using additive and non-additive environmental effects
- 4) Quantify the economic value difference among heifers using feed intake, fertility, lifetime productivity and longevity
- 5) Phenotype 2000 commercial heifers for feed intake and efficiency using Growsafe's marketing approach and create value indices for these heifers.

Benefit to the Industry: an accurate and reliable multi-trait selection index for heifers and cows will improve feed efficiency and sustainability, as well as profitability and competitiveness. Production of more efficient cows with improved performance will reduce production cost and carbon intensity.

