



“Improvement of cow feed efficiency and the production of consistent quality beef using molecular breeding values for RFI and carcass traits”

SELECTING FOR IMPROVED FEED EFFICIENCY AND CARCASS QUALITY

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Objectives: To demonstrate the use and economic value of genomic tools to breed more efficient cow herds and to sort feeder cattle into more uniform slaughter groups.

Background: Research under the first Beef Science Cluster (FDE.05.09 and BQU0.3.10) identified a number of genomic markers for efficiency of feed use in the feedlot and beef tenderness. However, the potential impact of selecting for improved feed efficiency on maternal traits (cow winter feed requirements and reproductive traits) is unknown, and the ability of genomic carcass quality markers to sort cattle into more uniform slaughter groups has not been studied.

What They Will Do: One study will use 420 crossbred cows, each randomly divided into control vs. efficient groups based on age, body weight and breed composition. In addition, two

purebred herds of 125 Charolais and 170 Angus cows will be selected for efficiency. The control groups will be selected based on traditional measurements such as calving ease, temperament, and weight, while the efficient heifers will be selected based on a multi-trait maternal index based on estimated breeding values (EBVs) for these traits, as well as residual feed intake (RFI) and feedlot profitability traits (in CH heifers only). Sires will be replaced at a rate of 25%/year selected similarly (traditional traits vs. genomic enhanced breeding values (GEBV) for these traits). Cows will be measured for reproductive performance, and progeny will be measured for individual feed intake and behaviour, growth, and carcass characteristics. The effectiveness of the breeding programs will be compared between the selection and control herds.

Steer progeny from this breeding program will be used in the second study. Molecular Breeding Values for ADG, backfat adjusted RFI, carcass weight, grade fat, ribeye area, marbling score and lean meat yield will be calculated for all steers before entering the feedlot. Steers from the GEBV breeding program will be assigned to a 70:70 Quality Grid program or a lean meat yield/maximum weight gain program. Steers will be fed using GrowSafe in commercial feedyards where feasible for the final 90-100 d of feeding to obtain RFI and individual feed intake. Carcass data will be collected from all steers.

Implications of the Research: This research will demonstrate how selecting for improved feed efficiency impacts maternal traits, as well as test whether genomic tests can sort cattle into more uniform slaughter groups.



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