Effect of Wagyu- Versus Angus-Sired Calves on Feedlot Performance, Carcass Characteristics and Tenderness

Radunz et al., The Ohio State University

Wagyu-sired (n = 20) and Angus-sired (n = 19) steers and heifers were used to compare the effects of sire breed on feedlot performance, carcass characteristics and meat tenderness. Calves were weaned at 138 ± 5 days of age and individually fed a finishing diet consisting of 65% whole corn, 20% protein/vitamin/mineral supplement and 15% corn silage on a DM basis. Heifers and steers were harvested at 1,180 and 1,235 lb, respectively. Carcasses were ribbed between the 12th and 13th ribs (USDA grading system) and the 6th and 7th ribs (Japanese grading system) to measure fat thickness, longissimus muscle area and intramuscular fat. Two steaks were removed from the 12th rib location and aged for 72 h and 14 d to determine Warner-Bratzler shear force and cooking loss.

- Carcasses of Wagyu-sired calves had greater marbling scores at the 12th rib than those of Angus-sired calves (770.9 vs 597.3, respectively: 500 = low Choice).
- Carcasses of Wagyu-sired calves also had greater 12th rib intramuscular fat and 6th rib intramuscular fat than Angus-sired calves, resulting in a higher proportion of carcasses grading Prime (65.0% vs. 21.1%).
- Carcasses from Wagyu-sired calves tended to have greater longissimus muscle area at 12th rib, while Angus-sired calves’ carcasses had greater longissimus muscle area at 6th rib.
- Steaks from Angus-sired calves and Wagyu-sired calves had similar tenderness at aging times of 72 h and 14 d. Cooking loss was greater for Angus-sired calves’ than Wagyu-sired calves’ steaks at both 72 h and 14 d.

Using Wagyu sires versus Angus sires on British-based commercial cows combined with early-weaning management strategies has the potential to produce product with greater marbling but is unlikely to significantly enhance tenderness.
Relationship of Various Incoming Cattle Traits With Feedlot Performance and Carcass Traits
Reinhardt et al., Kansas State University, Manhattan, Iowa State University and Certified Angus Beef

Steers (n = 15,631) and heifers (n = 5,897) fed at 18 feedlots in southwest Iowa between 2002 and 2006 as part of the Tri-County Steer Carcass Futurity sponsored by Iowa State University were used to correlate various phenotypic traits with feedlot performance and carcass traits. Dependent variables (average daily gain, respiratory morbidity, hot carcass weight, fat thickness, calculated yield grade, marbling score, presence or absence of lung damage, loin muscle area and loin muscle area x100/HCW) were evaluated on the basis of initial body weight, disposition score (1 = calm, 6 = extremely excitable), muscle score, frame score, body condition score, number of treatments for respiratory disease, presence of lung lesions, breed makeup and percentage Angus genetics.

- Cattle with greater disposition score (more excitable) had lower initial body weight, final body weight, average daily gain, hot carcass weight, yield grade, quality grade, marbling score and mortality.
- Respiratory morbidity was negatively correlated with initial body weight, average daily gain, yield grade, hot carcass weight and marbling score.
- As initial BW increased, final body weight and hot carcass weight increased and respiratory morbidity decreased.
- Cattle with greater body condition score on arrival had greater initial body weight but were lighter at harvest.
- Increased number of treatments for respiratory disease was associated with lower average daily gain, greater mortality rate and greater incidence of lung lesions.
- Gain was similar between English- and Continental-breed cattle, although final body weight and hot carcass weight were greater and yield grade and yield grade-adjusted marbling score were lower for Continental-breed cattle.
- Cattle with a poor muscling score had lower hot carcass weight and loin muscle area and greater yield grade, marbling score and quality grade.

Animal disposition, health, breed type and frame score have dramatic effects on live feedlot performance and carcass traits.

Reproductive Performance of Heifers Offered Ad Libitum or Restricted Access to Feed for a 140-Day Period After Weaning
Roberts et al., Fort Keogh Livestock and Range Research Laboratory, Miles City, MT

Reproductive performance was evaluated in composite heifers born over a three-year period that were randomly assigned to control (fed to appetite; n = 205) or restricted (fed at 80% of that consumed by controls adjusted to a common body weight basis; n = 192) feeding for a 140-day period, beginning about 2 months after weaning at 6 months of age and ending at about 12.5 months of age. Heifers were fed a diet of 67% corn silage, 18% alfalfa and 9% of a protein-mineral supplement (dry matter basis).

- Restricted heifers consumed 27% less feed over the 140 days and had lower average daily gain (1.17 vs. 1.43) than control heifers.
- After 140 days, all heifers were placed in common pens and subjected to an estrous synchronization protocol to facilitate artificial insemination at about 14 months of age. Heifers were then exposed to bulls for the remainder of a 51-day breeding season.
- Average body weight of heifers diverged within 28 days after initiation of feed restriction, and differences persisted through the prebreeding period (681 vs. 719 lb at approximately 13.5 months of age) and subsequent grazing season (904 vs. 922 lb at about 19.5 months of age).
From the end of the 140-day restriction at about 12.5 to 19.5 months of age, average daily gain was greater in restricted heifers than control heifers (1.12 vs. 1.04 lb/day).

Proportion of heifers attaining puberty by 14 months of age tended to be less in restricted (60 ± 3%) than control-fed heifers (68 ± 3%).

Mean body weight at puberty was less in restricted (681 lb) than control (719 lb) heifers.

Pregnancy rate from AI tended to be less in restricted (48 ± 4%) than control heifers (57 ± 3%).

Proportion pubertal at breeding and pregnant from AI was positively associated with heifer age and average daily gain from birth to start of study.

Final pregnancy rates were 87% and 91% for restricted and control heifers, respectively.

Day of breeding season that conception occurred was negatively associated with average daily gain from birth to weaning but was not associated with average daily gain within treatment.

Economic analysis revealed a $33 reduction in cost to produce a pregnant heifer under the restricted protocol when accounting for pregnancy rates and differences in BW and market prices between selection at weaning and marketing as open heifers at 1.5 years age.

A potential economic advantage exists for rearing replacement heifers on a restricted level of feeding during the postweaning period.

Effect of Number of Cows in Estrus and Confinement Area on Estrous Behavior of Beef Cows

Mature Angus and Angus x Hereford cows were used to determine the effects of confinement area and number of cows in estrus on estrous behavior. During each of 2 replicates, 32 nonpregnant, nonlactating cows were maintained in a drylot (72 x 328 feet) or in a pasture (27 acres). Estrous cycles were synchronized with 2 injections of PGF$_{2\alpha}$ 10 to 14 days apart at the initiation of the experiment. Thereafter, PGF$_{2\alpha}$ was administered between d 6 and 18 of the estrous cycle so that 1, 2 to 3, 4 to 6, or ≥ 7 cows were in estrus at the same time. Concentrations of progesterone were quantified in plasma at treatment to ensure cows had a normal response to PGF$_{2\alpha}$. Duration of estrus and the number of mounts received during estrus were recorded by HeatWatch.

Cows in the drylot had a shorter (61.8 ± 3.1 hours) interval to estrus after PGF$_{2\alpha}$ compared with cows on pasture (72.8 ± 3.3 hours).

The interval to estrus was longer when cows were treated with PGF$_{2\alpha}$ on d 10 to 13 (76.7 ± 3.3 hours) of the estrous cycle than when treated on d 6 to 9 (62.3 ± 4.7 hours) or d 14 to 18 (62.9 ± 3.6 hours).

Increasing the number of cows concurrently in estrus increased the number of mounts each cow received per estrus and the duration of estrus. When only 1 cow was in estrus, she received 11.0 ± 6.2 mounts during 11.6 ± 1.5 hours. When ≥ 7 cows were in estrus at the same time, each cow received 50.4 ± 3.2 mounts during 17.3 ± 0.8 hours.

Cows in drylot were in estrus longer (16.4 ± 0.8 hours) than cows on pasture (14.2 ± 0.7 hours).

Duration of the longest interval between mounts received decreased as the number of cows in estrus at one time increased (5.3 ± 0.7 hours for 1 estrous cow; 2.6 ± 0.3 hours when ≥ 7 cows were in estrus).

Increasing the number of beef cows in estrus at the same time will increase the number of times a cow is mounted and the duration of estrus. The increase in estrous behavior associated with more cows in estrus could increase the number of estrous cows detected with infrequent visual observation.
The effect of shifting calf-weaning age on profiles of energy status (body weight, body condition score, and rib and rump fat) and reproductive performance of beef cows was evaluated in a 3-yr study. Pregnant and lactating crossbred beef cows (n = 408), mainly of Angus and Hereford breeding, were assigned into two treatments: weaning at approximately 180 days (early weaning) and normal weaning 45 days later (control). Cows were managed together on native range pastures and supplemented with harvested forage during the winter months. Cow body weight, body condition score, rib fat and rump fat were measured periodically from early weaning through the next breeding. Reproductive performance was evaluated by calving intervals, days from initiation of breeding to calving, retention in the herd and adjusted 205-d weaning BW of the subsequent calf.

- Early weaned cows had greater body weight at normal weaning than control cows, but the overall pattern of cow body weight did not differ among treatments.
- Body condition scores were greater at each period in early weaned than in control cows and in cows ≥ 5 years old than in younger cows.
- Mean calving intervals (372.4 ± 2.1 days) and breeding to calving (299.7 ± 1.9 days) were not affected by treatment but varied with age of the cow. The intervals were longer in primiparous cows than in older cows.
- Early weaning decreased risk of culling in cows and thereby increased overall persistence by 11% over control cows.
- Earlier weaning of cows in the previous year increased weaning weight of the subsequent calf by 19 lb per cow per year.

Shifting weaning time increased storage of consumed energy, as evidenced by increased rump fat, for use later during high-energy demand, ultimately improving overall productivity of the cow-calf system.

**A Big Hamburger**

*Culinology®, June 2009*

Fans of the West Michigan Whitecaps, a minor-league baseball team, can sink their teeth into a major-league burger during home games at Fifth Third Ballpark in Comstock Park, MI. Weighing in at 4 pounds, the Fifth Third Burger includes five beef patties, five slices of cheese, chili, salsa and corn chips on an 8-inch sesame seed bun. Of the 32 people who tried to go it alone with the burger on opening day, 17 managed to finish it. For them, 4,800 calories and a free T-shirt.