



SusCatt - Increasing productivity, resource efficiency and product quality to increase the economic competitiveness of forage and grazing based cattle production systems

Performance and carcass traits of dairy and beef × dairy bulls in forage-based beef production

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About

A high proportion of Swedish beef comes from the national dairy herd where the cows are crossed with dairy bulls. However, crossbreeding dairy cows, not needed to breed replacement heifers, with beef bulls, could improve the carcass value of the off-springs. Furthermore, finishing these cattle on forage-based diets has the potential to increased land area under perennial forages, which are important carbon sinks. This project investigated the effect of crossbreeding dairy cows with beef sires on the performance and carcass traits of their off-spring, fed different proportions of forage in their diets.

Objective

To compare weight gain, feed efficiency and carcass traits in bulls born to dairy cows crossed either to dairy or beef sires, raised indoors at two feed intensities to different ages at slaughter.

What did we do and what did we find?

Weaned calves from a commercial dairy herd started the trial at 3-3.5 months of age with a mean live weight of 119 kg. There were a total of 69 bulls from Swedish Red or Swedish Holstein cows, 35 were sired by dairy bulls and 34 were crossbreds from Angus bulls. Half the bulls from each breed were fed a high-intensity diet and slaughtered at 15 months of age whereas the other half received a lower intensity diet and slaughtered at 18 months of age. Both total mixed rations consisted of grass-clover silage and rolled barley until slaughter, supplemented with cold-pressed rapeseed cake until 200 kg live weight and rolled peas until circa 325 kg live weight. The grass-clover silage made up 36% of dry



Bulls in the project at SLU Götala Beef and Lamb Research Centre. Photo: Elisabet Nadeau

matter (DM) in the high-intensity diet and 56% of DM in the low-intensity diet.

Individual feed intake and live weights were continuously registered automatically until slaughter, when carcass weights and traits were recorded followed by cutting, when cuts from one hindquarter of each animal were weighed.

Improved performance and carcass traits by cross breeding

The beef cross bulls grew, on average, 0.15 kg more per day compared to the dairy bulls (1.48 vs. 1.33 kg per day) at similar feed intakes, regardless of feed intensity. This resulted in 64 kg extra live weight for crossbred bulls at slaughter and, since killing out percent was also higher (3%), carcasses averaged 46 kg more for crossbred compared to the dairy bulls (Table), generating a greater revenue for the farmer ([SusCatt Technical Note 2.2.3](#)).

Crossbred bulls deposited more muscle and fat in their carcasses, described by higher carcass conformation and fatness scores and a lower proportion of carcass bone, compared to the dairy bulls (Table). The higher conformation

score reflects a tendency to a greater proportion of valuable retail cuts. Furthermore, the fatness score of the crossbred bulls reflects in a higher degree of visually assessed intramuscular marbling in sirloin steaks and more fat trim in the carcasses.



Carcass for scoring of conformation and fatness. Photo: Karin Wallin

Lower effect of feed intensity

The daily liveweight gain for bulls fed at the high intensity and slaughtered at 15 months averaged 0.14 kg more than for bulls on the lower intensity diet and had better feed efficiency, regardless of breed. However, bulls fed at the lower rate, slaughtered at 18 months reached higher live weight, produced a heavier carcass (+ 41 kg), and had a tendency for higher carcass fatness score, reflected in a greater marbling score of the sirloin steak (Table).



Foreman Jonas Dahl with one of the bull calves. Photo: Elisabet Nadeau

Conclusion

Using Angus semen on dairy cows gives bull calves with a potential for higher weight gains, carcass weights and better carcass characteristics regardless of feed intensity and the proportion of forage in the diet.

Table. Carcass characteristics of purebred dairy (D) and cross-bred dairy x beef (C) bulls fed at high (H) or low (L) feed intensity.

	Breed		Intensity		P - value ^a	
	D	C	H	L	Breed	Intensity
Live weight, kg	654	718	650	722	0.002	< 0.001
Carcass weight, kg	343	389	346	387	0.001	0.002
Dressing, %	52.5	54.2	53.1	53.5	0.003	0.363
Conformation ^b	5.5	7.3	6.3	6.5	< 0.001	0.499
Fatness ^c	8.1	9.6	8.6	9.1	< 0.001	0.064
Marbling ^d	1.5	2.3	1.7	2.1	< 0.001	0.005

^aP – values < 0.05 indicate significant differences between breeds and between feed intensities. ^bEUROP system: 5 = O, 6 = O+, 7 = R-. ^cEUROP system: 8 = 3, 9 = 3+, 10 = 4-. ^dVisually determined in sirloin steak on a scale 1 = lean and 5 = well-marbled.

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