



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

## Eating quality of meat from beef-cross and pure bred dairy steers reared on forage and semi-natural pastures

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### About

We know cattle contribute to climate change, but they also have an invaluable role in maintaining biodiversity, amenity and recreation value of semi-natural pastures. This project considered how extensive rearing of pure and crossbred dairy steers using semi-natural pasture influenced meat quality.

### Objective

Crossing dairy cows with beef bulls can give calves a higher growth potential than pure-bred dairy calves. Here we assess how rearing both types of calf, under semi-intensive or extensive systems, affect the eating quality of the meat produced.

### What did we do?

The study compared 32 pure-bred Swedish Red or Swedish Holstein dairy steer calves with 32 Charolais cross steers from Swedish Red or Swedish Holstein cows – under two different production systems. All cattle grazed semi-natural pasture in the summer and 16 calves from each breed were fed at moderately high intensity when housed in winter and slaughtered at 21 months giving approximately 300 kg carcass weight. These were compared with 16 calves from each breed, fed at lower intensity during the winters - slaughtered at 28 months of age and 330 kg carcass weight. More details of the rearing are in [SusCatt technical note 2.1.1](#).

Animals were followed from birth through to carcass cutting. After slaughter, carcass pH and temperature decline were measured and the strip loin (M. longissimus dorsi) was sampled to assess technological characteristics (tenderness, water holding capacity and



The younger, semi-intensively reared steers gave more tender meat than the older, extensively reared. Photo: Vanja Sandgren.

colour), fatty acid composition and sensory attributes. All meat was aged for seven days then frozen before analysis.

### Small differences in technological meat

Ideally meat ought to reach pH 5.7 or lower, if tenderness is not to be compromised. Although meat from the older, extensively reared animals, ended up at a lower pH than meat from younger, semi-intensively reared steers, both had good pH values. Nevertheless, the cutting resistance, or force required to cut through a defined piece of meat, was generally high, suggesting the need for more than seven days aging for these types of systems. As expected, meat from the older steers was slightly darker than meat from younger ones, otherwise there were no other differences between meat quality parameters measured.

### Young dairy steers the sensory favourite

Even though the technological assessment revealed little difference, either between breeds or production systems, sensory tests showed meat from beef crosses had poorer eating quality compared to purebred dairy

steers; with a coarser fibre structure and less intense red colour. Further, meat from the crossbred steers was less tender, assessed as cutting and chewing resistance, less juicy and perceived as having a more sour flavour.

The younger, more intensively, reared animals produced meat with a less intense red colour that was considered more tender than meat from the older, extensively reared steers, i.e. required less force to cut and chew. Interestingly, they also gave meat with a more intense game flavour.

### More unsaturated fat in older animals

The healthiness of beef for consumers has long been discussed in relation to its content of saturated fat. Even though the negative effects of saturated fatty acids on different conditions have been questioned, it is desirable to improve the fatty acid profile of beef by increasing the proportion of polyunsaturated fatty acids, especially omega-3 fatty acids.

In this study, we could see a higher proportion of unsaturated fatty acids in meat from older, extensively reared animals, which was also reflected in more omega-3 fatty acids. An interesting finding was that meat from the crossbreds contained a higher proportion of polyunsaturated fatty acids than meat from the pure dairy steers.

### Conclusion

Meat from younger, semi-intensively reared animals, regardless of breed, was more tender than meat from older, extensively reared animals. Further, meat from beef crosses had poorer eating quality than purebred dairy steers, due to coarser fibre structure, less tenderness and juiciness. However, the fatty acid profile was preferable from the crossbreds with a higher proportion of polyunsaturated fatty acids.



Karin Wallin takes samples of a loin for meat quality analysis.  
Photo: Frida Dahlström.



Meat from these type of systems need more than seven days aging for optimal tenderness. Photo: Frida Dahlström.

### Imprint

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