danish meat association

DMRI

Eating quality of meat from young bulls of different ages and fed in three different feeding systems

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Introduction

In Denmark, most beef comes from culled dairy cows. However, the industry wanted to test the quality of meat from heavy young bulls as an alternative to meat from dairy cows. Furthermore, meat from the heavy young bulls was compared with meat from the traditional 12 month young bulls. The meat quality evaluation focused on eating quality and colour. Three feeding systems were applied to test whether a more roughage-based ration compared with traditional Danish concentrate feeding would also ensure good eating quality.

Methods

Animals and feeding: 72 Holstein bull calves aged 3 months were randomly allocated to 3 treatment groups.

CON: The control treatment group had ad libitum access to a concentrate ration (1.00 Scand. Feed Units (SFU)/kg).

TMR+: had ad libitum access to a maize silage-based ration (0.33 SFU/kg) from the start of the experiment until they reached the age of 10½ months. Then the group changed to a barley-maize silage-based ration with high energy content (0.57 SFU/kg)

TMR- had ad libitum access to a maize silage-based ration (0.33 SFU/kg) from the start of the experiment until slaughter.

Results

Age at slaughter was 476, 515 and 483 days for CON, TMR- and TMR+ respectively for the "16-month-old" heavy young bulls (585 kg) and 351 days for the 12-month-old traditional young bulls. Culled dairy cows vas 53 months and slaughter weight was 299 kg.

Table 1. Mean Intra muscular fat (IMF %) and sensory scores* of steaks (longissimus dorsi) after cooking to intermnal temperature of 62°C

Animal age group	Feeding	N	IMF (%)	Sensory analysis (point) Tenderness	Juiciness	Meat flavour
Bulls aged **12 months**	**TMR-**	7	1.3	10.2[a]	9.2	8.6
	TMR+	8	1.3	10.5[a]	8.6	8.4
	CON	8	1.3	8.9[b]	8.7	8.5
Mean		23	**1.3 [z]**	**9.9**	**8.8 [y]**	**8.5 [z]**
Sign. Feeding			ns	*	ns	ns
Bulls aged approx. **16 months**	**TMR-**	15	2.1	9.5[ac]	8.8	9.0
	TMR+	15	1.9	9.1[bc]	9.3	9.1
	CON	15	2,2	9.8[a]	9.2	9.1
Mean		45	**2.1[y]**	**9.5**	**9.1[y]**	**9.1[y]**
Sign. Feeding			ns	*	ns	ns
Dairy cows		23	**4.2 [x]**	**9.8**	**9.7 [x]**	**9.7 [x]**
Sign. The 3 age groups			***	ns	**	***

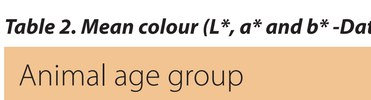
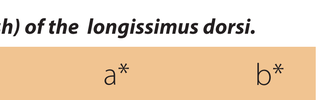
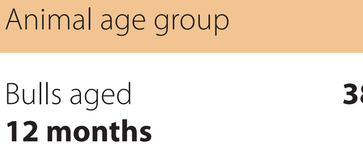
#Mean values within a column having different superscript letters are statistical significanlly different (P<0.05).
**unstructured line scale, anchored to the extremes; 0 point=slight, 15 points=intense*

Table 2. Mean colour (L*, a* and b* -Dataflash) of the longissimus dorsi.

Animal age group	L*	a*	b*
Bulls aged **12 months**	**38.2[a]**	**19.2[a]**	**10.4[a]**
Bulls aged approx. **16 months**	**33.2[b]**	**19.4[a]**	**9.1[b]**
Dairy cows	**32.1[b]**	**20.5[b]**	**9.3[b]**
Sign.	***	**	***

 # There was no difference between feeding groups

Colour of cooked steaks (longissimus dorsi) after cooking to internal temperature of 62 °C

Bulls aged 12 month	Bulls aged approx 16 month	Dairy cows
		
		
Mean sensory score for doneness (line 1 = raw/dark red – line 15 = well done)		
9,1	**7,1**	**5,8**

Conclusions

Steaks from heavy young bulls (aged approx. 16 months) had good eating quality corresponding to meat from 12-month-old young bulls and with a meat colour more like meat from culled dairy cows.

The feeding system had a small effect on meat tenderness.