

Compositional and sensory qualities of bull beef from different breeds and production systems

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Introduction

Suckler bull beef production systems

- Traditionally: involves provision of a high concentrate ration for a prolonged period
 - Less profitable because of the higher cost of concentrates compared to grass silage or grazed grass diets
- Incorporating a grazing period prior to finishing on a concentrate diet:
 - Reduces the production cost of late-maturing suckler bulls
 - But late-maturing suckler bulls may not meet the market requirements in terms of adequate carcass fat cover at a particular carcass weight
- Early-maturing breed types may be more suitable for a grass-based production system
 - Due to a higher genetic potential to deposit fat

Introduction

- **Aim:** To determine the influences of breed maturity and inclusion of a period of grazed grass in a suckler bull production system on the compositional and sensory characteristics of beef.
- **Hypothesis:** Late-maturing breed types could be replaced by early-maturing breed types, to achieve adequate fat cover and product quality specifications, in a suckler bull beef PS.

Materials and Methods

❖ Animals

- Spring-born suckler bulls (n = 56)

❖ Design

- 2 breed types × 2 production system- factorial arrangement

❑ Breed types (B)

- Early-maturing (**EM**)- Aberdeen Angus and Hereford-sired
- Late-maturing (**LM**)- Charolais and Limousin-sired

❑ Production system (PS)

- *Ad libitum* concentrates to slaughter (**C**)
- Grass silage *ad libitum* plus 2 kg concentrate daily during the winter (123 days) followed by 99 days at pasture and then C (**GSPC**)



Materials and Methods

- **Measurements:** on *Longissimus thoracis* muscle

- ❖ Compositional analysis

- ❖ Sensory analysis (trained panel)



- **Statistical analysis:**

- ❖ General Linear Model (SPSS).

- B, PS, interactions --> fixed factors

Results and Discussion

Proximate composition (g/kg)

Breed (B)	EM		LM		s.e.m	Significance		
	C	GSPC	C	GSPC		B	PS	I
Intramuscular fat	55.21 ^c	27.71 ^b	26.18 ^b	10.18 ^a	3.942	***	***	0.15
Moisture	720.0 ^a	738.1 ^b	747.1 ^b	748.7 ^b	4.79	***	*	0.09
Protein	228.7	233.3	228.5	230.7	2.647	0.59	0.2	0.66
Ash	10.48	12	11.19	11.31	0.586	0.98	0.17	0.24

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; I: interaction effect

Sensory characteristics¹

Breed (B)	EM		LM		s.e.m	Significance		
	C	GSPC	C	GSPC		B	PS	I
Tenderness	4.82 ^b	4.51 ^{ab}	4.63 ^{ab}	4.19 ^a	0.186	0.17	*	0.72
Juiciness	5.09	4.91	4.84	4.82	0.100	0.09	0.33	0.44
Beefy flavour	4.54	4.4	4.55	4.5	0.076	0.51	0.22	0.55
Abnormal flavour	2.29 ^a	2.49 ^b	2.28 ^a	2.41 ^b	0.080	0.61	*	0.62
Flavour liking	5.45 ^b	5.03 ^a	5.46 ^b	5.10 ^a	0.105	0.69	***	0.76
Overall liking	5.16 ^c	4.71 ^{ab}	5.03 ^{bc}	4.59 ^a	0.121	0.31	***	0.98

¹Scale 1-8 (8 extremely tender/juicy/intense flavour/liked); * p < 0.05, *** p < 0.001

Conclusion

- Using early-maturing in pasture based system:
 - increased the intramuscular fat content but this did not result in different sensory characteristics
- A period at pasture prior to finishing on concentrates:
 - led to a decrease in the sensory quality of the beef as assessed by a trained panel --> may be related to differences in marbling fat.

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Thank you for your
attention!!