

Finishing strategies for Belgian Blue and Limousin cross steers

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Introduction Belgian Blue and Limousin sires are used for cross breeding with Holstein-Friesian dairy cows and the resultant male calves are used for beef production. In beef winter finishing enterprises, a preliminary period of variable feeding may precede the finishing period to postpone slaughter date until beef prices are higher in late spring. The optimum feeding level in such a preliminary period has not been established. The aim of this study was to determine the effects of three feeding levels during a preliminary finishing period on feed intake, growth and carcass traits of Belgian Blue x Holstein-Friesian (BB) and Limousin x Holstein-Friesian (LM) steers.

Materials and methods Forty eight steers (24 BB and 24 LM) were blocked on live weight (BB 368, LM 391, s.d. 11.3, kg) within breed and assigned to 3 feeding levels for a preliminary feeding period of 112 days followed by finishing on concentrates *ad libitum* to a target slaughter weight of 610 kg. The 3 feeding levels in the preliminary period were (i) grass silage only (S0), (ii) S0 + 2.57 kg concentrate dry matter (DM) per head daily (S3), (iii) S0 + 5.13 kg concentrate DM per head daily. The silage analysis was 208 g/kg DM, 146 g/kg crude protein in DM, 701 g/kg *in vitro* DM digestibility, pH 3.9. The concentrate formulation was 875 g/kg rolled barley, 65 g/kg soya bean meal, 45 g/kg molasses and 15 g/kg mineral/vitamin premix. Accommodation was a slatted shed fitted with Calan boxes for individual feed recording. The animals were slaughtered in a commercial abattoir where cold carcass weight (0.98 hot weight), carcass grades for conformation and fatness, and weights of perirenal plus retroperitoneal fat were recorded. The data were statistically analysed as a 2 (breeds) x 3 (feeding levels) factorial, using general linear model least squares procedures, with terms for block, breed, feeding level and breed x feeding level.

Results As a consequence of their heavier initial live weight, LM were still heavier ($P < 0.001$) than BB after 112 days, but at slaughter there was no difference in live weight between the breeds. BB tended to have higher daily live weight gains than LM during finishing but the differences were not significant. BB had a higher ($P < 0.001$) kill-out and a lower ($P < 0.001$) carcass fat class than LM. At the end of the preliminary period, S3 was 53 kg heavier ($P < 0.05$) than S0, and S6 was 26 kg heavier ($P < 0.05$) than S3. After 97 days on *ad libitum* concentrates (day 209), S3 had overtaken S6 in live weight, and the difference between S0 and S3 was reduced to 34 kg ($P < 0.05$). Both S3 and S6 reached slaughter weight at the same time while S0 required a further 35 days to slaughter weight. During the preliminary period, daily live weight gain responses to the first and second 2.57 kg/day concentrate DM increments were 483 and 220 g, respectively. The corresponding differences in the opposite direction afterwards to 209 days were 189 and 300 g. Other than carcass fat class which was higher for S0 there were no differences in carcass traits. For similar slaughter and carcass weights, S6 required more ($P < 0.001$) concentrates and net energy than both S0 and S3, while S0 required more ($P < 0.001$) silage and net energy than S3.

Conclusions BB had superior finishing traits to LM with a higher kill-out proportion, better carcass conformation and a lower carcass fat class. S3 achieved similar slaughter and carcass weights to S6 with 357 kg less concentrate DM (but 154 kg more silage DM) and 290 UFV less net energy. S0 and S3 had similar concentrate intakes but S0 required 163 kg more silage DM and 148 UFV more net energy. Where a preliminary feeding period precedes a finishing period on *ad libitum* concentrates, the target growth rate during that period should be around 0.8 kg/day. Higher growth rates will be compensated during finishing while lower growth rates require an extended finishing period.

Table 1 Effects of breed and finishing strategy on steer performance

	Breed (B)		Finishing Strategy (F)			s.e. ¹	Significance		
	BB	LM	S0	S3	S6		B	F	BxF
LW at 112 days (kg)	463	481	428 ^a	481 ^a	507 ^c	3.5	***	***	NS
LW at slaughter (kg)	609	618	615	614	611	6.7	NS	NS	NS
ADG 0 – 112 days (g)	848	805	431 ^a	914 ^b	1134 ^c	26.0	NS	***	* ⁴
ADG 112 – 209 days ² (g)	1365	1310	1563 ^a	1374 ^b	1074 ^c	57.3	NS	***	NS
ADG 0 days-slaughter (g)	1076	1009	945 ^a	1101 ^b	1081 ^b	29.5	NS	**	NS
Days to slaughter	226	226	249	214	214	-	-	-	-
Carcass weight (kg)	338	339	333	334	334	4.0	NS	NS	NS
Kill-out (g/kg)	556	533	542	545	547	2.8	***	NS	NS
Fat class	3.1	3.8	3.6 ^a	3.4 ^b	3.4 ^b	0.05	**	*	*** ⁵
Total silage intake (kg) ³	820	830	985 ^a	822 ^b	668 ^c	16.6	NS	***	NS
Total concentrate intake (kg) ³	1469	1476	1369 ^a	1345 ^b	1702 ^b	9.0	NS	***	NS
Total net energy intake (UFV) ⁴	2267	2282	2276 ^a	2128 ^b	2418 ^c	21.8	NS	***	NS

¹For Breed; ²Last common weight before slaughter; ³DM; ⁴Unite Fourragere Viande; ⁵Values for S0, S3 and S6 = 401, 901 and 1234 (BB), and 453, 927 and 1035 (LM); ⁵Values for S0, S3 and S6 = 3.0, 3.0 and 3.3 (BB), and 4.2, 3.7 and 3.6 (LM); ^{abc}Values with a

common superscript do not differ significantly ($P > 0.05$); LW = live weight; ADG = average daily gain.