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Beef Unit Trial Results – 2003 (b)

Wholecrop Wheat for Finishing Beef Cattle

Objective:

The objective of this experiment was to determine the effect of feeding either Fermented wholecrop (FWC), Cracked Head-cut or Low-cut urea treated wholecrop wheat (Alkalage) in comparison to *ad lib* cereals on the performance of Continental x suckler bred steers.

Stock:

The trial started in January 2003 with 54 weaned ¾ bred Limousin suckled steers born from March–May 2002 with a mean live weight of 266kg.

Forage:

The wholecrops were made from the same field of winter wheat (variety: Consort), which had been grown as a commercial cereal crop. The crop had a standing height of 75cm at harvest. The FWC and Low-cut Alkalage was cut at a stubble height of 30cm. The Head-cut was cut at 50cm i.e. harvesting the top 25cm. The FWC was treated with an inoculant. The Alkalage was harvested with a forage harvester fitted with a 'Primary Processing Mill' and treated with 40kg/t Home n' Dry.

Dry matter yields were 13.77t, 14.19t and 12.12t/ha for the FWC, Low-cut Alkalage and Head-cut Alkalage respectively.

Treatments:

Cereals - 13%CP Barley mix plus straw from racks.

FWC2 - Fermented wholecrop plus 2.0kg 20% CP concs

FWC4 - Fermented wholecrop plus 4.0kg 20% CP concs

HCA - Head-cut Alkalage plus 100g minerals

HCA + L - Head-cut Alkalage plus 500g Lactofeed plus mins

LCA + L - Low-cut Alkalage plus 500g Lactofeed plus mins

The 13% CP barley mix was formulated as follows: 85% rolled barley, 8% soyabean meal, 5% molasses, 2% minerals. The 20% CP concentrate was formulated as follows: 67% rolled barley, 14% rapeseed meal, 14% soyabean meal, 5% molasses.

The rationale for feeding Lactofeed (Lactose) is that it effectively utilises the ammonia within Alkalage to create microbial protein. Relatively 'low-cost' liquid lactose blends are commercially available and should be considered if suitable storage facilities are available. An alternative to Lactose would be molasses.

Results:

Table 1: Animal performance (kg/head)

	Cereals	FWC2	FWC4	HCA	HCA+L	LCA+L	Sig
Start wt (kg)	264	265	266	268	266	266	NS
Slaughter wt (kg)	505^{abc}	494^{bc}	513^{ab}	517^{ab}	525^{a}	483^{c}	*
Days to slaughter	170^{b}	202^{a}	192^{a}	194^{a}	190^{a}	209^{a}	*
DLWG (kg)	1.42^{a}	1.12^{cd}	1.29^{be}	1.23^{ce}	1.37^{ab}	1.01^{d}	*

Within row, means with the same superscripts are not significantly different (*p>0.05*). NS = not significant, * = *P<0.05*

The cattle were weighed 'gut full' prior to slaughter and the carcasses were trimmed to UK specification.

Table 2: Carcase characteristics

	Cereals	FWC2	FWC4	HCA	HCA+L	LCA+L	Sig
Carcase wt (kg)	276	268	278	279	285	262	NS
Killing out %	55.1	54.3	54.0	54.1	54.5	54.3	NS
Conformation class*	4.4 (R/-U)	4.3	4.2	4.2	4.2	4.0	NS
Fat class*	3.9 (4L)	3.6	3.8	3.8	3.9	3.6	NS

*EUROP carcase classification: Conformation: P+=1 and E=7. Fat class: 1=1 and 7 = H.

Table 3: Feed intakes (kg) and feed conversion ratio (FCR)

	Cereals	FWC2	FWC4	HCA	HCA+L	LCA+L
13% CP Barley Mix	1,399					
Straw	170					
20% CP Mix		403	763			
FWC		2,188	1,727			
Head-cut Alkalage				1,634	1,690	
Low-cut Alkalage						1,383
Lactofeed					95	105
Minerals		20	19	19	19	21
Total Intake (kg Fwt)	1,569	2,611	2,509	1,748	1,709	1,574
Total DM Intake	1,329	1,348	1,445	1,380	1,515	1,253
Daily DM Intake	7.81	6.68	7.53	7.12	7.96	5.99
FCR (kg feed DM: kg gain)	5.51	5.90	5.86	5.79	5.84	5.76

Table 4: Financial appraisal with all feeds at 'cost of production' – January 2003

Feed costs - January 2003	Cereals	FWC2	FWC4	HCA	HCA+L	LCA+L
Feed cost per kg gain (p)	48	38	44	38	46	45
Gross margin/Head (£)	103	110	105	122	107	85

Since the cattle were finished over a period of 170-209 days, it would in theory be possible to finish 1.74 to 2.14 groups of cattle per year. Gross margins were therefore calculated for a 365 day period. The rolled barley included in the concentrates was assumed to be home grown and thus included in the area of land required in the stocking rate calculation.

Table 4: Gross Margins per Head per Year and per Hectare – January 2003

Margins - January 2003	Cereals	FWC2	FWC4	HCA	HCA+L	LCA+L
G Margin/Place/Year (£)	221	199	168	228	205	149
Stocking rate (cattle/ha)	3.15	5.26	4.38	4.74	4.48	6.94
Gross margin/Ha (£)	695	1,047	875	1,089	922	1,036

Conclusions:

- Overall animal performance was comparable to results achieved by top third recorded commercial beef producer's winter finishing suckled calves recorded by EBLEX.
- Similar performance was recorded for the Head-cut Alkalage plus Lactose and Cereal fed cattle.
- Fermented wholecrop + 2kg concs and Head-cut Alkalage produced the lowest feed costs per kg gain and the highest gross margins per hectare.
- Feeding wholecrop enables intensively finished cattle to be fed higher yielding crops of wheat compared to barley.
- All of the wholecrop systems had higher stocking rates and significantly higher margins per hectare compared to cereal (barley) beef.
- For a beef producer to change over from a cereal beef system to wholecrop may require investment in feed storage and handling facilities. Additional straw may need to be acquired for bedding if all cereals on farm are made into wholecrop.

Reference:
Marsh, S.P. and Gibson, I. 2004 Whole crop wheat for intensively finished beef cattle. *Proceedings of the British Society of Animal Science*. Paper 190.

Acknowledgement: Financial support from the Maize Growers Association is gratefully acknowledged.

November 2003