Animal Science Research Centre - Beef Unit Trial Results – 2011 (b)

Alkagrain for finishing beef cattle

Introduction:
There is growing interest in feeding Alkagrain to dairy and beef cattle in the UK as well as in Australia and Ireland. Alkagrain is alkaline preserved processed mature cereal grain.

Alkagrain is normally produced by combine harvesting then processing (crimping, rolling, milling or kibbling) a dry cereal crop and mixing with Home n' Dry pellets prior to storage (Home n' Dry contains 146% CP and is formulated from urea and selected soya protein sources). This rapidly releases ammonia into the cereals killing off moulds and bacteria, raising the pH into the alkaline range (pH 8.0-9.0). The typical inclusion rate for Home n' Dry is 30kg/t which increases the protein content of the cereals by approximately 4.3 percentage units. Alkagrain then becomes a 'complete feed' for intensively fed cattle apart from the addition of minerals, trace elements and vitamins. Alkagrain is stored in a clamp and therefore farmers do not need purpose built dry grain storage. Alkagrain is unattractive to vermin.

The objective of this experiment was to compare the effect of feeding either Alkagrain or a conventional Barley based home mix to dairy-bred bulls.

Materials & Method:

34 Jan-Feb 2010 born dairy-bred bulls weighing 300kg @ 7 months old. There were 30 Holstein and 4 Continental x Holstein bulls. Slaughtered February-April 2011. Bulls randomized to the following treatments formulated to contain 14% CP 'as fed':

Barley Mix
A*d lib* Barley Mix containing 77.5% rolled barley, 7.5% soyabean meal, 7.5% rapeseed meal, 5% molasses, 2.5% minerals.

Alkagrain
Dry crimped barley (86.1% DM) treated with 32kg/t Home n' Dry and clamped. Fed *ad lib* with 2.5% minerals.

Straw was offered *ad lib* from racks. The Barley Mix and Alkagrain cost £170.63/t and £169.51/t respectively. Costing were based on the following feed prices: rolled barley @ £145/t, soyabean meal @ £285/t, rapeseed meal @ £175/t, molasses @ £155/t, minerals @ £240/t, Home n' Dry @ £550/t.

Results:

Table 1: Animal performance (bulls @ 300kg start wt)

(kg/bull)	Barley Mix	Alkagrain	Sig
Slaughter wt	559	563	NS
Days to slaughter	196	201	NS
DLWG	1.32	1.31	NS

NS = not significant, * = P<0.05, ** = P<0.01

Table 2: Carcase characteristics

	Barley Mix	Alkagrain	Sig
Carcase wt (kg)	283.7	284.7	NS
Kill out (%)	50.7	50.6	NS
Carcase DG (kg)	0.730	0.716	NS
Conformation[1] (1-7)	2.1	2.2	NS
Fat class[1] (1-7)	2.9	2.8	NS
Liver score[2] (1-5)	2.12	1.35	=0.101

[1] EUROP carcase classification: Conformation: P+=1 and E=7, Fat class: 1=1 and 5H=7.
[2] Liver assessment: 1= Healthy liver and 5 = Severe abscesses

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

	Barley Mix	Alkagrain
Total concentrate intake	1,758	1,666
Daily concentrate intake	8.98	8.30
FCR (kg feed: kg gain)	6.79	6.43
FCR (kg feed: kg carcase gain)	12.47	11.52

The FCR's appears relatively high for the barley fed bulls compared to the EBLEX target of 5.4:1 but it must be taken into consideration that the trial did not include the period of growth from 110kg to 300kg. During this rearing phase dairy-bred bulls at Harper Adams typically record a DLWG of 1.56kg with an FCR of 3.3:1.

Table 4: Financial performance (£/bull)

	Barley Mix	Alkagrain
Feed costs (£/bull)	300	282
Feed cost/kg live wt gain (£/kg)	1.16	1.07
Feed cost/kg carcase gain (£/kg)	2.13	1.95

Discussion & Conclusions:

- Overall performance of the bulls was very good, both achieving and exceeding recognised targets for intensive cereal beef production.
- Feeding Alkagrain had no significant effect (P>0.05) on slaughter weight, DLWG, carcase weight and carcase grade.
- Alkagrain feeding improved FCR by 5.3% through achieving the same growth rates whilst consuming 5.2% less feed (92kg per bull and 0.68kg per day).
- The Alkagrain fed bulls recorded lower liver damage scores but this was not statistically significant (P = 0.101). Liver damage is associated with acidosis.
- Alkagrain diets contained more cereals (94.6% v 77.5%) therefore allowing cereal growers to substantially reduce bought-in feed costs worth 18.7p per kg live weight gain.
- Replacing Barley Mix with Alkagrain reduced feed costs by £18 per bull. This saving in feed costs would have been significantly higher if the bulls had been fed on Alkagrain from 12 weeks of age. Feed costs per kg live and carcase weight gain were reduced by 9p (7.7%) and 18p (8.5%) respectively with Alkagrain based on the costs prevailing at the time of the study.

Reference:

Marsh, S.P., Brown, J. and Graham, M. 2011 Alkagrain for finishing beef cattle. *Proceedings of the British Society of Animal Science.* Paper 45

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