

Animal Science Research Centre - Beef Unit Trial Results – 2012 (a)

Oats for intensively for finished bulls

Introduction:

Intensively fed cattle are traditionally fed diets based on rolled barley however a number of enquiries were received at recent EBLEX/Harper Adams intensive beef finishing meetings on replacing some or all of the barley with oats. Compared to barley, oats have a lower energy value (12.2 v 13.2 ME MJ/kg DM) and starch content (42 v 59% in DM) and a higher fibre content (35 v 21% NDF). This may not appear to be beneficial when it is starch that drives live weight gain with intensively fed bulls. Feeding oats however could result in reduced problems with rumen acidosis with consequential improvements in performance.

The objective of this experiment was to determine the effect of full or partial replacement of rolled barley with rolled oats to intensively finished Holstein and Continental cross Holstein bulls through to slaughter.

Materials & Method:

48 Sept-Oct 2010 born dairy-bred bulls weighing 282kg @ 6-7 months old. There were 42 Holstein and 6 Continental x Holstein bulls. Slaughtered Oct-Dec 2011. Bulls randomized to the following treatments formulated to contain 12% CP 'as fed':

Barley Mix

Ad lib Barley Mix containing 84.5% rolled barley, 4% soyabean meal, 4% rapeseed meal, 5% molasses and 2.5% minerals.

Barley/Oats

Ad lib Barley/Oats Mix containing 41.75% rolled barley, 41.75% oats, 4.5% soyabean meal, 4.5% rapeseed meal, 5% molasses and 2.5% minerals.

Oats

Ad lib Oats Mix containing 82.5% rolled barley, 5% soyabean meal, 5% rapeseed meal, 5% molasses and 2.5% minerals.

Straw was offered *ad lib* from racks. The Barley, Barley/Oat and Oat Mixes cost £172.81, £181.20 and £189.40/t respectively. Costing were based on the following feed prices at the time of the study: rolled barley @ £152/t, oats @ £170/t, soyabean meal @ £288/t, rapeseed meal @ £190/t, molasses @ £130/t, minerals @ £350/t.

Results:

Table 1: Animal performance

(Kg/bull)	Barley	Barley/Oats	Oats	Sig
Start wt	283	283	282	NS
Slaughter wt	593 ^a	579 ^{ab}	556 ^{bc}	*
Days to slaughter	242	231	236	NS
DLWG	1.29	1.28	1.17	=0.093

Within row, means with the same superscript are not significantly different ($P>0.05$)

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

Table 2: Carcase characteristics

	Barley	Barley/Oats	Oats	Sig
Carcase wt (kg)	302	294	283	=0.096
Kill out (%)	50.8	50.8	50.7	NS
Carcase daily gain (kg)	0.70	0.70	0.65	NS
Conformation ¹ (1-7)	2.4	2.4	2.2	NS
Fat class ¹ (1-7)	2.7	2.6	2.5	NS
Liver score ² (1-5)	1.33	1.00	1.33	NS

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	Barley/Oats	Oats
Total concentrate intake	2,101	2,157	2,196
Daily concentrate intake	8.68	9.34	9.31
FCR (kg feed: kg gain)	6.78	7.29	7.39
FCR (kg feed: kg carcase gain)	12.40	13.34	14.32

The FCR's appears relatively high for the 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 280kg. During this rearing phase dairy-bred bulls at Harper Adams typically record a DLWG of 1.52kg with an FCR of 3.4:1. Straw intakes were recorded for a 48 day period during October and November. Daily intakes were 0.90, 0.67 and 0.57kg/h/d for the Barley, Barley/Oat and Oat fed bulls respectively.

Table 4: Financial performance (£/bull)

	Barley	Barley/Oats	Oats
Carcase value (£)*	933	900	860
Feed cost (£/bull)	363	391	416
Margin over Feed (£/bull)	570	509	444
Feed cost/kg live wt gain (£/kg)	1.16	1.32	1.51
Feed cost/kg carcase gain (£/kg)	2.14	2.42	2.71

* The bulls were slaughtered from October 2011 to January 2012

Discussion & Conclusions:

- Overall performance of the Barley and Barley/Oats fed bulls was satisfactory achieving similar results to the recognised targets for intensive cereal beef production.
- The Barley fed bulls recorded significantly higher ($P<0.05$) slaughter and carcase ($P=0.096$) weights compared to the Oats fed bulls. The Barley and Barley/Oats fed bulls recorded higher ($P=0.093$) DLWGs compared to the Oats fed bulls.
- Replacing Barley with Oats increased feed intakes and which subsequently resulted in poorer concentrate FCR, however the Barley fed bulls recorded the highest straw intakes.
- There were no significant differences in carcase classification or liver scores (liver damage is associated with acidosis).
- The highest margin over feed was recorded with the Barley fed bulls which was £61 and £126 more than the Barley/Oats and Oats fed bulls based on the costs prevailing at the time of the study. Oats would have to cost £49-51/t less than Barley to justify their inclusion in a cereal based ration.
- A relatively low inclusion rate (approximately 10-15%) of Oats should be investigated. This inclusion rate could minimise problems of acidosis with rations containing very high (>36% as fed, >42% in DM) starch levels and maintain/improve animal performance.

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