Ground Ear Maize as an Alternative Forage Source for Beef Cattle in Ireland

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Introduction Demand for cereal grain from non-agricultural sources has increased the cost of feed grain in recent months resulting in immense pressure on livestock producers worldwide to find equivalent alternative energy sources .Recently there has been an increased use of other ensiled forages such as maize and whole-crop cereals (Walsh et al . ,2008) .Ground ear maize (GEM) is a novel approach to utilising the maize plant as a forage source in Ireland .Essentially it consists of the corn and cob mix with a portion of the leaf still present .The objective of this experiment was to grow ,harvest and evaluate GEM as feed source compared to barley grain in beef cattle .

Materials and method A commercial maize crop consisting of the cultivar Justina was sown on 15th April 2004 and was harvested using a Olimac stripper maize header on the 4th November 2004 for GEM ,the components of which are the cobs and husks with limited stalk .GEM was then ensiled in round wrapped plastic bales by an Orkel baler .Twenty four beef cattle were randomly allotted to one of two treatments (1) GEM-based diet (2) concentrate barley-based diet (Table 1) .The cattle were individually fed using an electronic feeding system (Calan ,Inc . ,Northwood ,Newhampshire ,USA) .The GEM was offered as a total mixed ration ,while the barley diet was offered separately .Both diets were offered with chopped barley straw ,starting at a 50 :50 ratio for the first 6 days .Daily intake was recorded for each animal from Day 7 to 14 .Faecal grab samples were taken from the animals on Day 13 and 14 at 6 hourly intervals in order to determine nutrient digestibility using chromic oxide as a marker .All data were analysed using SAS (SAS ,2004) .

Results and discussion The effect of dietary treatment on dry matter intake (DMI) and nutrient digestibility is presented in Table 2 .Steers offered GEM had a significantly higher DMI ($P<0.05$) compared with those offered the barley grain based diet . However ,steers offered the barley grain based diet had a significantly higher digestibility of neutral detergent fibre ($P<0.05$) , organic matter ($P<0.05$) and dry matter ($P<0.05$) .There was no dietary treatment effect on organic matter or gross energy digestibility ($P>0.05$) .

Table 1 *Composition and analysis of experimental diets (g/kgDM) .*

Composition (g/kgDM)	GEM	Barley
GEM	795	0
Barley	0	765
Soya bean meal	135	90
Straw	45	120
Vitamins and minerals	25	25
Dry matter	550	870
Crude protein (N x 6 .25)	133	132
Neutral detergent fibre	276	262
Gross energy (MJ/kg)	18 .4	18 .8

Table 2 *The effect of dietary treatment on dry matter intake and apparent nutrient digestibility (LSM +/-s .e .m .) .*

	GEM	Barley	SEM	P
DMI (g/kgDM)	7 .32	6 .29	0 .381	0 .069
Digestibility Coefficients				
Nitrogen	0 .639	0 .692	0 .020	0 .092
Neutral detergent fibre	0 .429	0 .579	0 .003	0 .007
Ash	0 .392	0 .367	0 .002	NS
Organic matter	0 .680	0 .776	0 .001	0 .002
Dry matter	0 .665	0 .759	0 .001	0 .002

Conclusions Ground ear maize has shown potential as an alternative feedstuff to cereal grain by increasing DMI compared to a barley grain-based diet .This study warrants further investigation into the effect of ground ear maize on animal performance and ruminal fermentation kenetics .

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