



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

An examination of ground ear maize for finishing beef animals

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Project Background

- Potential increase in DMI when maize silage replaces grass silage either totally or as part of the forage base
- Improvements in DMI have not consistently resulted in increased growth rates
- Winter feeding – increase variable costs
- Value for money from feedstuffs is essential for profitable production systems
- Alternative harvest methods for forage maize are under examination at UCD



What is ground ear maize?

- A high grain yield and good grain maturity is required for the successful production of GEM
- Seeding rate of $\approx 98,000$ seeds per hectare,
- Plastic important for the development of high starch, high dry matter cobs
- At harvesting the plant stems are pulled down through the header, chopped and spread over the soil
- Cobs are snapped off the stem during this process and continue through the harvester where they are chopped



Ground Ear Maize



Hypothesis

- GEM as a superior feedstuff compared to barley grain:
 - ✓ improve growth performance
 - ✓ increase nutrient digestibility
 - ✓ reduce enteric methane emissions of finishing beef heifers.



Materials and Methods

- 30 finishing beef heifers (friesian x limousin) were randomly allocated to one of two treatments:
 1. Ground Ear Maize
 2. Barley based diet
- Individual feed intake, and weekly weight gain was recorded for a 52 day period
- Animals had *ad lib* access to feed



Dietary composition and chemical analysis g/kg DM

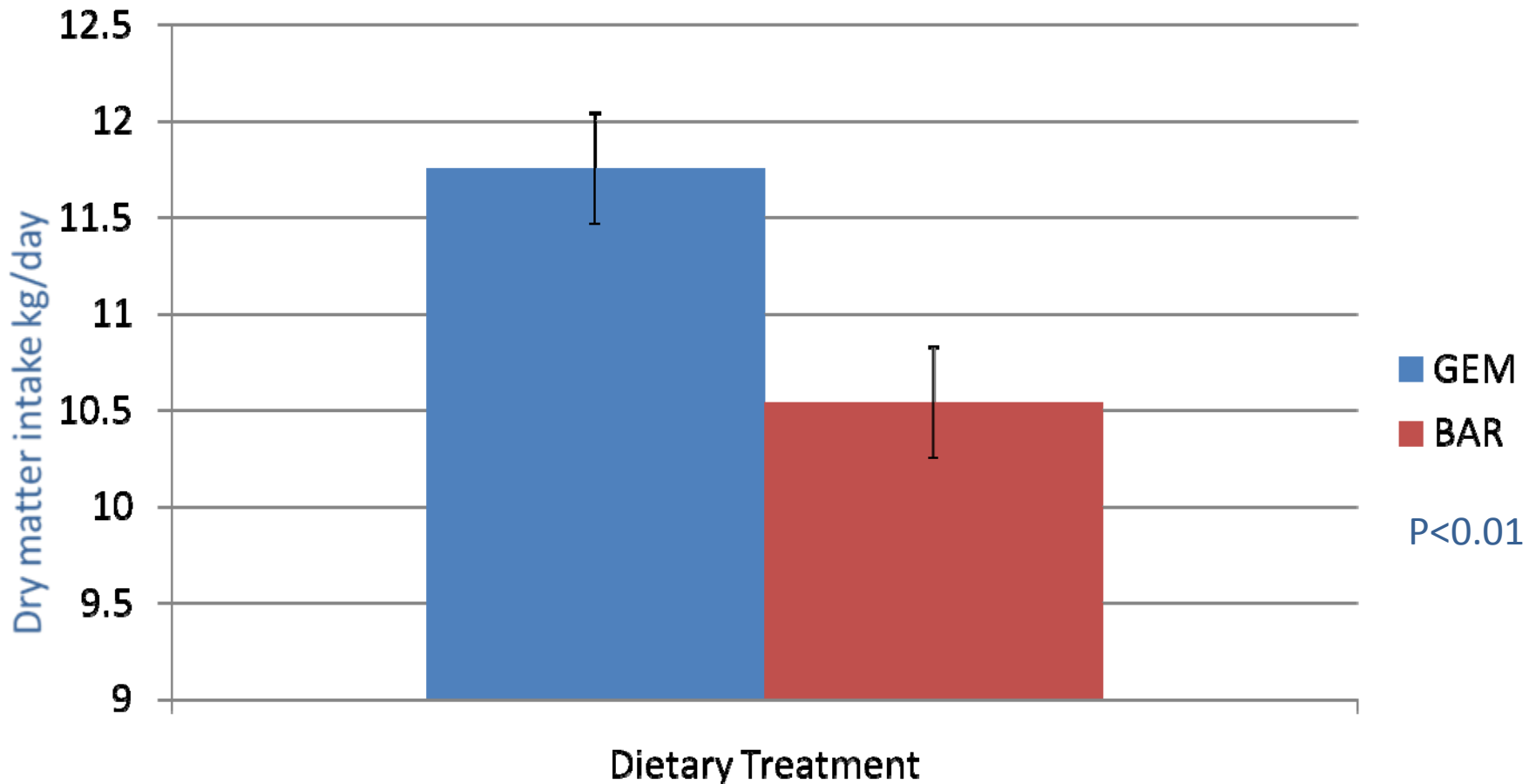
Ingredient	GEM	Barley
GEM	800	0
Barley	0	740
Soya bean meal	125	80
Grass silage	57.5	84.5
Straw	0	80
Minerals and vitamins	17.5	15.5
Dry Matter	489	715
Crude protein	130	119
Neutral detergent fibre	269	267
Starch	541	369
Gross Energy MJ/kg	18.3	18.0

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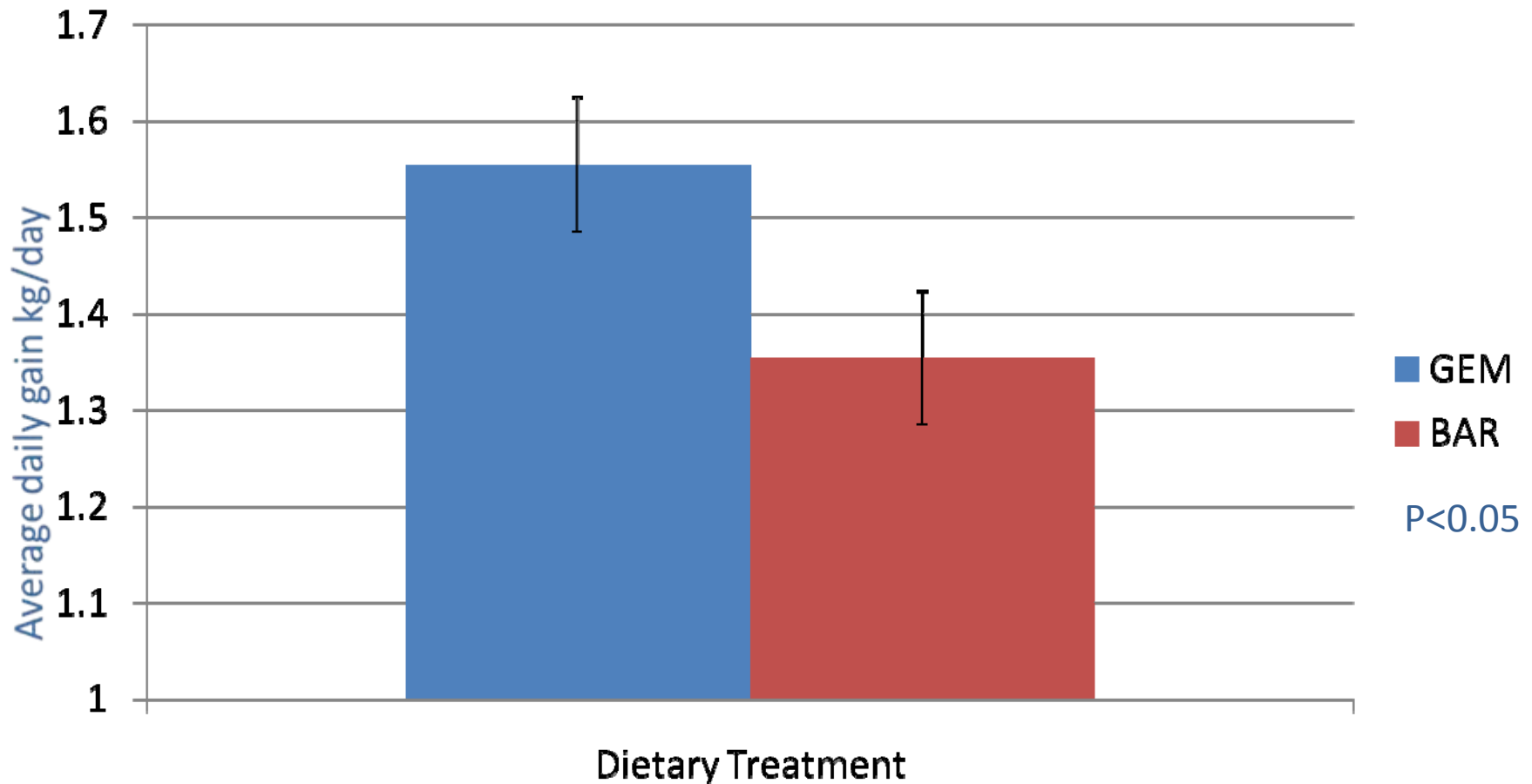
Dry Matter Intake kg/day

12% increase in DMI

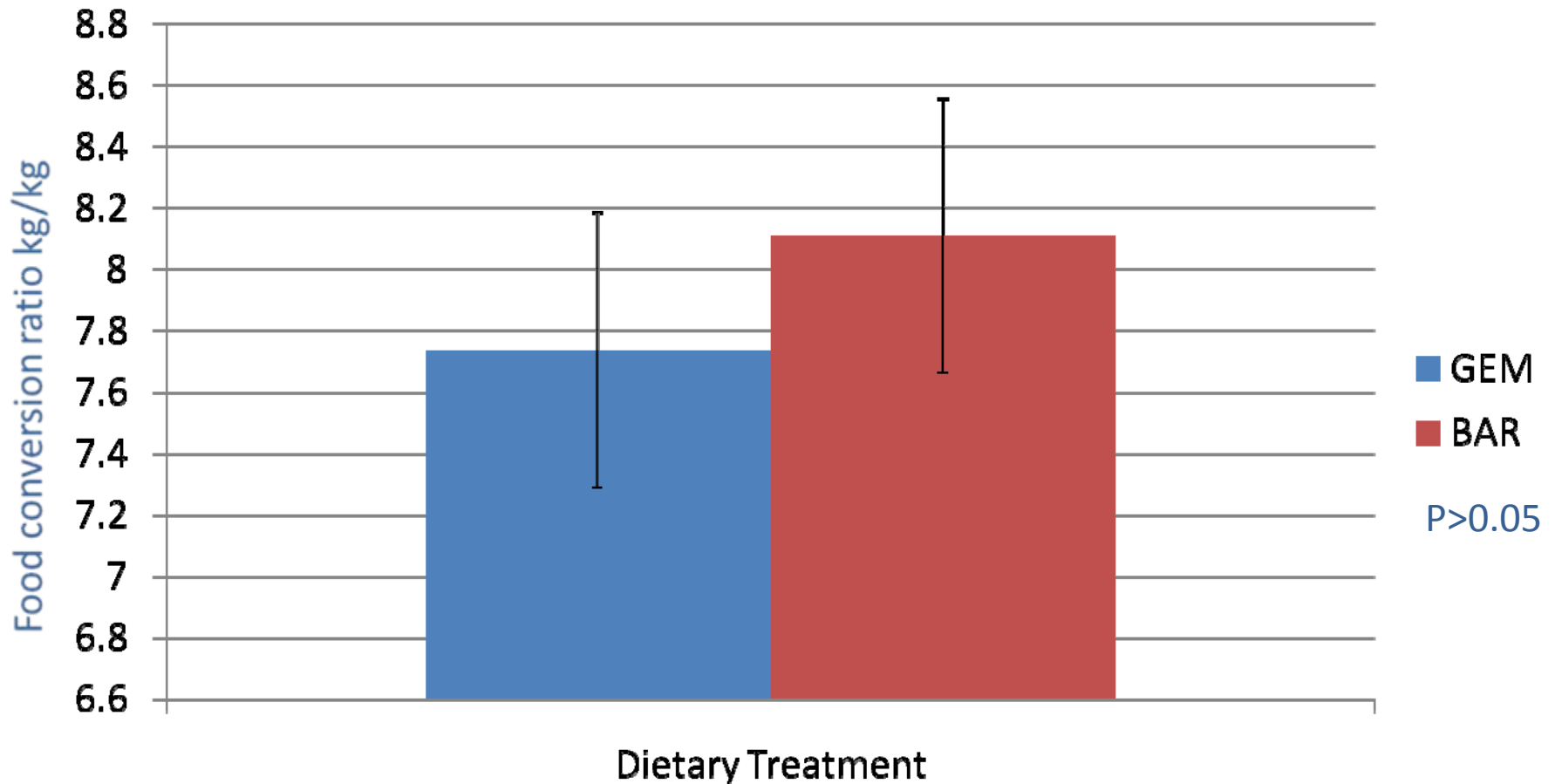


Average Daily Gain kg/day

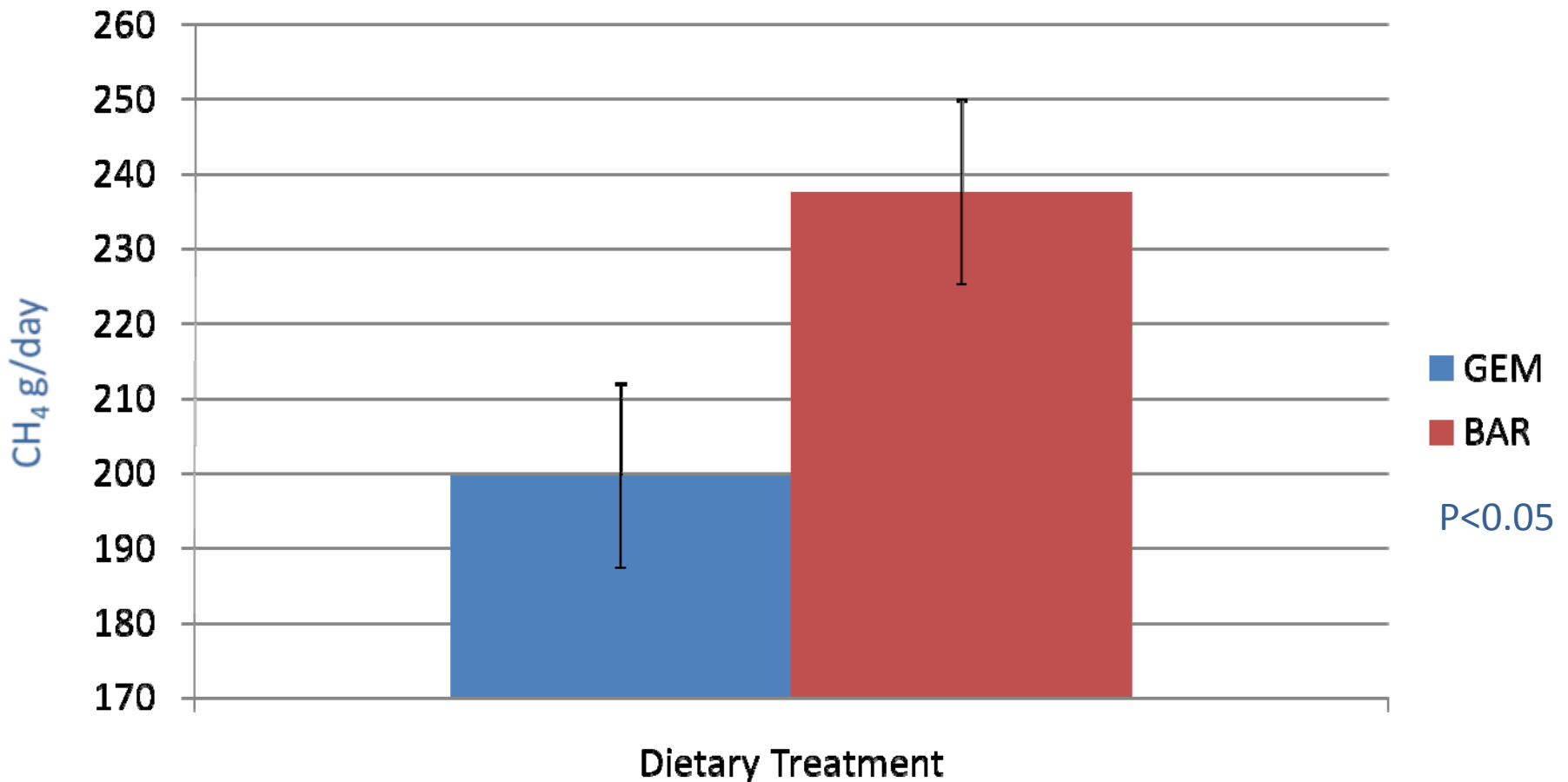
200g/day or 15% increase in weight gain



Food conversion ratio kg/kg



Methane emissions g/day



Total tract nutrient digestibility

Digestibility coefficient	GEM	Barley	SEM	P-value
Dry matter	0.731	0.658	0.009	0.0001
Organic matter	0.749	0.673	0.009	0.0001
Ash	0.387	0.354	0.012	0.0730
Nitrogen	0.661	0.561	0.013	0.0001
Neutral detergent fibre	0.552	0.518	0.016	0.1438
Acid detergent fibre	0.400	0.337	0.024	0.0738
Starch	0.990	0.964	0.003	0.0001
Gross energy	0.720	0.597	0.031	0.0001



Cost of production for baled ground ear maize

	/ha
Cost of production (high cost for fertilizer as no slurry used)*	€1500
Silage yield	19t
GEM yield	8.23t
Bales	17.5
Cost/ bale	€85.71
Ensiling	
Bale/wrap/handling	€15
Cost/bale	€100.71
Cost/ t DM baled	€214.14

*excluding land rental @ €300



Conclusion

- Heifers offered a GEM based diet during the finishing period had higher DMI, gained **200g** more liveweight per day and emitted **21%** less DMI corrected methane compared to those offered the barley diet.
- ✓ **27% less CH₄ per kilo gain**

