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THE EFFECT OF ENSILING BARLEY WITH PASTURE ON EFFLUENT PRODUCTION AND THE PERFORMANCE OF GROWING CATTLE

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Ensilage of low dry matter pasture is often an unavoidable compromise under high rainfall spring environments. Consequently the production of effluent is a major concern as a potential environmental pollutant and as a carrier of large quantities of soluble nutrients. The addition of cereal grains at ensiling has been shown to reduce effluent production (Jones, 1988). This trial was conducted to assess whole grain barley as an effluent absorbent and the potential of such a silage as a complete diet for finishing beef cattle.

Three silage stacks were made (silage only (S), silage + 75 kg barley/t fresh pasture (SLB), silage + 150 kg barley/t fresh pasture (SHB). In addition the same treatments were ensiled in 100 kg drums fitted with a drain plug to monitor effluent production. Forty-five Friesian-Angus steers were penned individually, blocked according to live weight and allocated to one of five treatments; S, SLB, SHB and silage plus rolled barley offered at the bin level, at the same rates as ensiled (BLB, BHB). Intakes (DMI), feed conversion ratios and live weight changes were monitored over 78 days. After slaughter dressing % and P8 fat depth was measured. Results for animal performance and dietary composition are shown below.

	Treatment					l.s.d.
	S	SLB	SHB	BLB	BHB	
Initial live weight (kg)	291.9	301.0	289.1	292.1	293.2	11.00
Final live weight (kg)	334.0^{a}	345.2^{a}	347.3^{a}	345.3^{a}	374.4^{b}	13.95
Average daily gain (kg/d)	0.54^{a}	0.57^{a}	0.75^{a}	0.68^{ab}	1.04^{c}	0.143
Dry matter intake (kg/d)	6.08^{a}	8.17^{b}	7.39^{b}	7.80^{b}	9.18^{c}	0.951
FCR (feed/gain kg)	12.23^{ab}	15.02^{a}	10.45^{b}	12.21^{ab}	9.08^{b}	3.431
Dressing %	55.5^{a}	56.2^{a}	58.5^{b}	57.7^{b}	60.3^{c}	1.50
P8 fat (mm)	4.3^{a}	5.0^{a}	5.2^{ab}	5.7^{ab}	6.3^{b}	1.48
Diet composition:						
ME (MJ/Kg DM) (cal. IVDMD)	9.28	10.43	10.67	9.80	10.15	-
CP, (%DM) (N x 6.25)	15.38	13.47	15.87	14.44	13.83	
Silage quality:						
Dry matter (g/kg)	171.2	295.7	296.4	-	-	-
pH	3.98	4.03	3.85	-	-	-

Means in the same row with different superscripts significant at $P<0.05$.

Effluent production was almost eliminated at the highest level of grain inclusion (S;10.1, SLB:4.5, SHB; 0.3 l/100 kg ensiled pasture). The ME content of the total diet was higher with SLB and SHB diets compared with BLB and BH. This was a result of the retention of water soluble carbohydrates due to the reduction in effluent production and the inclusion of barley. However this improved quality did not produce the concomitant animal production response compared with barley and silage offered separately (BLB, BHB). At equivalent levels of grain addition live weight gains were higher and feed conversion ratios lower with BLB and BHB diets. It was noted that the aerobic stability of the silage was reduced when grain was included, a condition considered partially responsible for the reduced voluntary feed intake of SHB treatment. The poor production response may in part be also due to the form in which the grain was offered (whole in the pit vs rolled at the bin level) although it was expected that the absorption of effluent by whole grain during ensilage would split the grain.

These results indicate that the addition of barley at ensiling will reduce effluent production and loss of nutrients but the physical form of the barley in the stack relative to animal performance requires further investigation.

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