

EFFECTS OF COTTON-SEED MEAL AND CEREAL GRAIN SUPPLEMENTS ON INTAKE
AND UTILIZATION OF ALKALI-TREATED WHEAT STRAW

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Growth rate of cattle eating NaOH-treated wheat straw was increased by feeding a supplement of cotton-seed meal, when intake of straw was unaffected by the supplement (Srisankandarajah et al. 1981). This paper reports on a subsequent experiment in which comparative growth responses to supplements of cotton-seed meal and cereal grains were examined.

Wheat straw was sprayed with a NaOH solution (40 g NaOH in 113 g H₂O/kg) followed by a mineral solution supplying (g/kg) 79 H₂O, 15 N, 1 S and (mg/kg) 4 Cu, 0.1 Co and sprinkled with dicalcium phosphate supplying (g/kg) 2.0 P and 2.6 Ca. The treated straw was supplemented with 800 g/day of cotton-seed meal (CSM), cracked barley (CB), extruded barley (EB), ammonia-treated whole barley (NB) or whole barley (WB) and fed to 45 Friesian heifers (250 kg live weight).

TABLE 1 Dry matter intakes (DMI) of treated straw, digestible organic matter in dry matter (DOMD), intake of digestible organic matter (DOMI) and live-weight gain (LWG) of Friesian heifers fed supplements with a basal diet of NaOH-treated straw

Supplements	DMI (g/d)	DOMD (%)	DOMI (g/d)	LWG (g/d)
CSM	8046	53.1 ^a	4668 ^a	891 ^a
CB	8121	51.7 ^a	4580 ^a	761 ^{abc}
EB	8241	48.7 ^b	4371 ^a	784 ^{ab}
NB	7720	47.7 ^b	4027 ^b	657 ^c
WB	7780	47.2 ^b	4026 ^b	639 ^c
SEM	187.3	0.87	118.9	44.6

Values with different superscripts differ significantly ($P < 0.05$).

The mean intake of treated straw on CSM, EB and CB treatments was higher than the mean intake on WB and NB treatments ($P < 0.05$). Similarly, DOMI and LWG were higher on treatments CSM, EB and CB than on treatments WB and NB ($P < 0.05$). High DOMI values were attributable to high DMI and DOMD values. Total DMI was unusually high (125-134 g W^{0.75}) for dry cattle eating such a poor quality diet. Lower DOMD on WB than CB conforms with known differences in digestibility of whole and cracked grains in cattle. Under conditions of this experiment, ammonia-treatment of whole grain had a negligible effect on its digestibility.

Responses in DOMI and LWG on CB and EB were not significantly different from those on CSM, although there was a trend which indicated marginal superiority of CSM. Oldham et al. (1979) reported that when urea + barley, comprising 34% of a forage/concentrate diet, was replaced by fish meal, there was a synergistic effect on digestibility. In the present experiment, where supplements comprised 8% of the diet, the marginal effect of CSM on DOMD may have had a synergistic component.

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