

Protein supplements for maize silage finishing rations

Based on work produced by Grundy, H, Wheeler, K and Hardy, R. 1996

Maize silage is a high-energy, high-starch feed, however, it has a low concentration of rumen degradable protein (Table 1). In a finishing cattle ration, where crude protein levels of 12-14% are required, supplementation with a high-protein feed is recommended.

Table 1: Typical analysis for maize silage

Dry matter (DM) %	Metabolisable energy (ME) (MJ/kg DM)	Crude protein (CP) % in DM	Starch % in DM
28-35	10.8-11.7	8-9	25-35

Research by ADAS investigated the potential of using either rapeseed meal or maize gluten feed as a protein supplement when feeding maize silage to continental-cross-dairy bulls.

The study

The 60 Limousin-cross-Holstein Friesian bulls involved in the trial were introduced to the finishing ration at five to six months of age. The two rations contained maize silage, rolled barley and either rapeseed meal or maize gluten feed. To ensure that calcium supply was not limiting the performance of the bulls, limestone flour was added to the maize gluten diet. The nutritional analysis of the two protein sources investigated in the study are shown in Table 2.

Table 2: Typical analysis (% DM or MJ/kg DM for ME) of rapeseed meal and maize gluten feed

Protein supplement	DM	ME	CP	NDF	Oil	Starch	Sugars
Rapeseed meal	88.0	12.1	38.5	36.0	3.5	5	9.5
Maize gluten feed	89.0	12.5	21.7	40.0	4.0	21.0	3.0

Each diet contained either 200g rapeseed meal or 575g maize gluten feed per kg fresh weight. The rolled barley was fed at 3kg/head (fresh weight) per day up to 320kg liveweight and then increased to 3.3kg/head per day, before being further increased to 3.5kg/head per day once the bulls reached 420kg liveweight. It remained at this rate until the bulls were finished. Bulls were selected for slaughter when judged to be at an EU fatness score of 3 to 4L. The maize silage was provided *ad libitum*.

Results

The study found liveweight gains, carcass weights and slaughter age were similar for bulls receiving rapeseed meal and maize gluten. Animals fed maize gluten tended to eat greater quantities of maize silage, which consequently reduced feed conversion efficiency (Table 3). Previous studies have shown the tendency for maize silage intakes to be higher with maize gluten feed may be due to the lower starch content of this supplement compared to other high-protein sources. However, this was not the case in this study as maize gluten feed contained higher amounts of starch than rapeseed meal .

Table 3: Performance of continental crossbred bulls fed ration containing

	Rapeseed meal ration	Maize gluten ration
Daily liveweight gain throughout trial	1.06	1.09
Age at slaughter (days)	471	477
Carcass weight (kg)	311	316
DM intake maize silage (kg/day)	4.2	4.5
DM intake compound (kg/day)	2.9	2.9
Feed conversion ratio (DM intake: liveweight gain)	6.8	7.0

These results show both maize gluten feed and rapeseed meal can provide effective protein supplementation to maize silage. Whenever feeding conserved forages, it is essential accurate nutritional analysis is undertaken so rations can be formulated accurately and in a cost-effective way.

Sampling silage is important to understand quality. Six weeks after harvesting, take several core samples from the clamp for testing. Continue to test samples from the clamp face throughout the season as feed value continues to change in the months after harvest.

For more information on feeding maize silage, please see the BRP manuals [Growing and Feeding Maize Silage for Better Returns](#) and [Feeding Growing and Finishing Cattle for Better Returns](#).