

Replacement of maize/soybean meal concentrate by high moisture maize grain plus wholeseed soybean silage for cattle

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Introduction Ensiling high moisture maize grain with wholeseed soybean can increase quality of silage, mainly in relation to protein and energy (Jobim *et al.*, 2002) working as concentrate. This fact contributes to reduced use of concentrate and costs for milk and beef production, and costs related to grain storage on the farms. The objective of this study was to evaluate the nutritive value of high moisture maize grain plus wholeseed soybean silage through partial and total digestibility in cattle.

Materials and methods Three ruminal and duodenal cannulated steers (Nelore x Red Angus) (305 kg live weight) were fed to 1.5% of live weight. Treatments consisted of maize silage (60%) plus a concentrate (40%) as follows: CGSBM (maize grain + soybean meal); HMS33 (high moisture maize grain plus wholeseed soybean silage, 3:1); HMS66 (high moisture maize grain plus wholeseed soybean silage, 1:3). At ensiling wholeseed soybean and high moisture grain were ensiled at a ratio of 1:7. Experimental period lasted 14 days, with 10 days for adaptation and 4 days for digesta (200 mL) and faeces (50 g) sampling. Samples were collected every 4 hours, for 4 days, advancing 2 hours per day, totalling 12 digesta and 12 faecal samples per animal per period. Samples were analysed for dry matter (DM), crude protein (CP) and starch (S).

Results Ruminal DM digestibility was not influenced ($P>0.05$) by inclusion of high moisture grain silage in the diet. HMS 66 increased ($P<0.05$) intestinal DM digestibility relative to CGSBM and HMS 33. HMS 66 had higher ($P<0.05$) total DM digestibility than HMS 33. Ruminal CP digestibility was not influenced ($P>0.05$) by inclusion of high moisture grain silage in the diet, but HMS 66 increased digestibility in relation to CGSBM. Intestinal CP digestibility was not influenced ($P>0.05$) by inclusion of high moisture silage in the diet. HMS 66 increased ($P<0.05$) total CP digestibility relative to CGSBM and HMS 33. There was no difference ($P>0.05$) among treatments in relation to ruminal, intestinal and total starch digestibility.

Table 1 Ruminal dry matter digestibility (RDMD), intestinal DMD (IDMD), total DMD (TDMD), ruminal crude protein digestibility (RCPD), intestinal CPD (ICPD), total CPD (TCPD), ruminal starch digestibility (RSD), intestinal SD (IST) and total SD (TSD)

| | CGSBM | HMS33 | HMS66 | SE | VC(%) |
|----------|--------------------|-------------------|-------------------|------|-------|
| RDMD (%) | 61.1 | 59.6 | 60.3 | 3.17 | 9.1 |
| IDMD (%) | 25.3 ^b | 25.3 ^b | 36.1 ^a | 4.04 | 24.2 |
| TDMD (%) | 71.1 ^{ab} | 69.9 ^b | 74.6 ^a | 9.95 | 2.4 |
| RCPD (%) | 34.4 | 37.1 | 41.3 | 8.41 | 38.5 |
| ICPD (%) | 40.1 | 37.2 | 45.6 | 6.43 | 27.1 |
| TCPD (%) | 61.5 ^b | 61.3 ^b | 68.2 ^a | 1.21 | 3.2 |
| RSD (%) | 75.3 | 79.4 | 78.9 | 3.11 | 6.9 |
| ISD (%) | 80.1 | 75.6 | 80.1 | 3.72 | 5.3 |
| TSD (%) | 95.3 | 95.2 | 96.1 | 3.84 | 1.7 |

a and b, within a line, are different ($P<0.05$) by Tukey test.

Conclusions Replacement of maize grain plus soybean meal by high moisture maize grain silage with 14% of wholeseed soybean in cattle concentrate increased crude protein digestibility without effects on dry matter and starch digestibility.

References

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