INFLUENCE OF AMAFERM® ON FORAGE INTAKE, SITE OF DIGESTION, IN SITU DEGRADABILITY AND DUODENAL AMINO ACID FLOW IN STEERS GRAZING COOL-SEASON PASTURE

J. S. Caton, D. O. Erickson, D. A. Carey, and D. L. Ulmer

AMAFERM increases nutrient utilization on more mature, poorer quality forages.

SUMMARY

DOSE OF AMAFERM USED
2g per head, per day

Supplementing 2 g/h/d AMAFERM to cattle grazing on bromegrass pasture increased their forage intake and increased the digestibility of NDF and ADF in July. In June, total duodenal amino acid flow was increased by AMAFERM, and microbial protein synthesis was stimulated by AMAFERM.

VALUE

With AMAFERM, forage nutrient utilization is increased when grazing poorer quality forages, commonly found late in the growing season.

PROTOCOL

Type of Animals/Experimental Units

- Ruminally and duodenally cannulated Hereford steers, and esophageally cannulated Hereford steers

Number of Animals/Experimental Units

- 10 with ruminal and duodenal cannula (326 kg BW), 4 with esophageal cannula (394 kg BW

Trial Design

- Split-plot design

PROTOCOL (CONTINUED)

Treatments

- Control or 2 g/h/d AMAFERM delivered through ruminal cannula via gelatin capsule

Diet Information

- Grazing on bromegrass pasture

Data Collection

- Forage dry matter (DM) and organic matter (OM) intake
- 0, 4, 8, 12, 16, 24, 36, 48, 72 hours in situ DM and NDF degradability
- ruminal fluid and particulate passage rates
- rumen pH, ruminal VFA and ammonia concentrations

DISCUSSION OF RESULTS

- Microbial and non-microbial N flowing to the duodenum were greater in June and unaffected in July and August by AMAFERM supplementation, but microbial protein synthesis was stimulated (329.9 vs. 189.3 g/d, $P < 0.10$) by AMAFERM during June
- OM intake was significantly increased by AMAFERM supplementation (31.5 vs. 25.4 g/kg of BW, $P < 0.05$) and IVDMD (65.2 vs. 59.3%, $P < 0.10$)
- In steers fed AMAFERM (Table 1), AMAFERM x sampling-period interaction was noticed on site of digestion, and microbial efficiency when total tract and ruminal digestion of OM, NDF and ADF were decreased in June and increased in July
- AMAFERM supplementation did not affect ruminal pH, VFA or ammonia concentrations ($P > 0.10$)
- Ruminal N digestion was decreased (33.3 vs. 45.2%) and postruminal N digestion was increased (47.7 vs. 39.4%) in response to AMAFERM during June, but a reversed effect was noticed in July
- In June, in situ NDF disappearance was lower at 12, 16, 48 and 72 hours for AMAFERM supplemented steers, lower at 72 hours in July, and lower at 8 hours in August
- In July, lag time was less in AMAFERM steers than Control steers (2.03 vs. 4.09 h, $P < 0.1$)
- In August, the rate of NDF digestion was greater in AMAFERM steers (5.62 vs. 4.03 %/h)
- Total duodenal essential and nonessential amino acid flow was increased in steers supplemented with AMAFERM, which was likely a result of increased N intake

Table 1
Influence of AMAFERM on site and extent of OM, NDF and ADF digestion in steers

	June		July	
Item	**Control**	**AMAFERM**	**Control**	**AMAFERM**
OM digestibility, %				
Total	83.6[a]	78.7[b]	59.1[b]	67.3[a]
Ruminal	72.3[a]	65.2[b]	39.1[b]	50.1[a]
NDF digestibility, %				
Total	82.3[a]	76.4[b]	57.6[b]	61.4[a]
Ruminal	81.6[a]	76.2[b]	54.7[b]	62.4[a]
ADF digestibility, %				
Total	77.2[a]	71.4[b]	47.7[b]	55.4[a]
Ruminal	76.7[a]	69.7[b]	43.5[b]	52.4[a]

[a,b] Means within a period and row that do not have common superscripts differ ($P < 0.1$)

POINTS TO CONSIDER

How does 143 grams (g) of additional microbial protein compare to traditional protein supplementation? We can translate the 143 g to .31 lbs – (143 g/454 g in a lb.). Multiplying .31 lbs. by the known 80% protein content of the microbes equates to .25 lbs. of additional protein from Amaferm (Table 2).

Table 2
Impact of additional .25 lbs. protein from AMAFERM on common protein sources

Plant Protein Source	Crude Protein % *DM Basis	Impact of of AMAFERM	Additional Lbs. Protein Source Required to Match AMAFERM Impact in Steers
Canola	41%	.25 lbs.	.25 lbs./.42 = .60 lbs.
DDGS	30%	.25 lbs.	.25 lbs./.30 = .83 lbs.
Corn gluten feed	24%	.25 lbs.	.25 lbs./.24 = 1.04 lbs.
Cottonseed meal	49%	.25 lbs.	.25 lbs./.49 = .51 lbs.
Soybean meal	54%	.25 lbs.	.25 lbs./.54 = .46 lbs.

*DM = Dry Matter

BIOZYME INCORPORATED
6010 Stockyards Expy I St. Joseph, MO 64504 USA
Tel: 816-238-3326 I Fax: 816-238-7549
support@biozymeinc.com I www.biozymeinc.com

BIOZYME® INCORPORATED