

## IN VITRO STIMULATION OF FORAGE FIBER DEGRADATION BY RUMINAL MICROORGANISMS WITH AMAFERM®

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**Total bacteria number and rate of fiber degradation were stimulated by AMAFERM filtrate.**

### SUMMARY

AMAFERM (0.067 mg/ml, equivalent to 3 g/d in a 50 L rumen) stimulated 12-hour NDF degradation of bromegrass by 28%. AMAFERM filtrate at 0.08% (12.5 g/100ml) increased 12-hour NDF degradation of switchgrass by 12%. Total viable bacteria were increased 3-fold and cellulolytic bacteria were increased 1.4-fold by 8% AMAFERM filtrate.

### DOSE OF AMAFERM USED

0.067 and 0.2 mg/ml AMAFERM (0.067 mg/ml is equivalent to 3 g/d in a 50 L rumen), or 0%, 0.0008%, 0.008%, 0.08%, 0.8%, 8% and 80% AMAFERM filtrate (12.5 g/100 ml)

### PROTOCOL

#### Type of Animals/Experimental Units

- In vitro

#### Number of Animals/Experimental Units

- Cell wall degradation: triplicates of each substrate at each time point (0, 12, 24, 48 hours)
- Microbiological analyses: duplicate in vitro tubes
- Ferulic and *p*-coumaric acid analyses: duplicate in vitro tubes

#### Trial Design

- Completely randomized design

#### Treatments

- Bromegrass hay or switchgrass hay incubated with or without AMAFERM

## PROTOCOL (CONTINUED)

### Diet Information

- Diet of the donor cow included 70% corn silage, 20% alfalfa hay, 9% soybean meal and 1% vitamins and minerals

### Data Collection

- Cell wall degradation: VFA and residual fiber content at 0, 12, 24, 48 hours
- Microbiological analyses: total viable and cellulolytic bacteria counts
- Ferulic and *p*-coumaric acid analyses: concentrations of ferulic and *p*-coumaric acid

## DISCUSSION OF RESULTS

- Adding AMAFERM to in vitro tubes at either 0.067 mg/ml or 0.2 mg/ml increased the degradation of bromegrass NDF at 12 hours (11.3% vs. 8.1%, 28% increase and 12.1% vs. 8.1%, 33% increase for 2 AMAFERM concentrations, respectively ( $P < 0.01$ ), but not at 24 or 48 hours. The degradation of hemicellulose and cellulose fractions of NDF were also increased by AMAFERM ( $P < 0.01$ )
- Increasing amounts of NDF were degraded with increasing levels of AMAFERM filtrate – 0.008% up to 8% after 12-hour fermentation, however 80% AMAFERM filtrate decreased the amount of NDF degraded by 38%
- When 8% AMAFERM filtrate was added, there was a 3-fold increase in total viable bacterial count (8.3 vs. 25.7x10<sup>9</sup>/ml ( $P < 0.05$ ), and the cellulolytic bacterial count increased 1.4-fold (9.7 vs. 18.0x10<sup>6</sup>/ml ( $P < 0.05$ ). When 80% AMAFERM filtrate was added, the total viable bacterial count increased 5-fold (8.3 vs. 40.3x10<sup>9</sup>/ml), while the cellulolytic bacterial count decreased 3.5-fold (9.7 vs. 2.8x10<sup>6</sup>/ml)

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