

THE EFFECT OF A-MAX XTRA VS A-MAX ULTRA ON RUMEN MICROBIAL METABOLISM IN CONTINUOUS CULTURE.

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Introduction: The inclusion of smaller amounts of supplemental feeds is always a high priority. It also reduces inventory and shipping costs. There is a specific amount of A-MAX™ fermentate that is needed to positively affect cow performance; however, the inclusion of smaller amounts of carrier may be possible to reduce the total quantity of product. A-MAX has a unique carrier such that it is porous and it can adsorb a high proportion of the liquid fermentate. Thus widening the carrier to fermentate ratio may allow a reduction of product inclusion with similar efficacy. This was the case with A-MAX Concentrate and A-MAX Xtra (2 oz/cow/d vs. 1 oz/cow/d).

Objective: To determine the effect of rumen microbial metabolism in continuous culture when a TMR was fed with either A-MAX Xtra at 1 oz/cow/d or A-MAX Ultra at .5 oz/cow/d.

Materials and Methods: This study was conducted in a continuous-culture system (Hoover et al. 1996, J. Anim. Sci., 43:528). The system was operated under the following conditions: liquid dilution rate: 12%/h, solid retention time: 22 h, feed intake: 100 g DM/d, feeding frequency: twice daily, fermentation temperature: 39°C. The data was subjected to ANOV analysis.

Results: In this study there were no significant differences between the 1 oz vs. .5 oz/h/d products on nutrient digestion coefficients, VFA proportions or quantities, ruminal pH, microbial N metabolism and partitioning or nutrient utilization efficiencies in continuous culture.

Conclusion: The carrier to liquid fermentate ratio used to manufacture A-MAX can be widened such that a .5 oz/cow/d product (A-MAX Ultra) has the same efficacy in the rumen as a product fed at 1 oz/h/d (A-MAX Xtra).

Results Tables:

Table 1. Digestion Coefficients for Dry and Organic Matter, Fiber and Nonstructural Carbohydrates ¹		
Item	A-MAX™ Xtra 1 oz	A-MAX Ultra .5 oz
Digestion, %		
Dry Matter	68.5	68.5
Organic Matter	49.6	51.3
Neutral Detergent Fiber	54.7	55.5
Nonstructural Carbohydrate	86.8	82.5

Table 2. Volatile Fatty Acid (VFA) Production, Molar Ratios and Average Daily Fermenter pH ¹ .		
Item	A-MAX Xtra 1 oz	A-MAX Ultra .5 oz
Total VFA, mmoles/d	405	406
Molar Percentages:		
Acetic	53.5	53.6
Propionic	28.9	26.2
A-P Ratio	1.90	2.07
mmoles/day:		
Acetic	216	218
Propionic	118	106
Average pH	6.20	6.28

Table 3. Nitrogen partitioning, Microbial Growth and Microbial Efficiency ¹ .		
Item	A-MAX Xtra 1 oz	A-MAX Ultra .5 oz
Ammonia, N, Mg/dl	8.28	8.18
Bypass N, g/d	1.19	1.06
Microbial N, g/d	1.79	1.91
Efficiencies:		
Mic. N/kg DMD ²	26.2	27.8
Mic. N/kg CHOD ³	42.2	45.7

¹ No significant differences (P<.05) between treatments.

² Microbial N produced/kg dry matter digested.

³ Microbial N produced/kg carbohydrate digested.

