Research Notes D-43

Arm & Hammer Animal and Food Production

The effect of CELMANAX on production performance in dairy cattle.

INTRODUCTION

Yeast and yeast products have been used in ruminant nutrition to manipulate rumen fermentation and, therefore, production response. In the last few years it was observed that feeding of derivatives of the yeast cell wall influenced the composition and metabolic activity of the intestinal microflora and has shown to have beneficial effects in improving animal health response. In this study[1] two such products were tested for production performance in dairy cattle.

OBJECTIVE

To evaluate the effects of supplementing yeast culture (YC) and Mannan Oligosaccharide (MOS) vs. Enzymatically Hydrolized Yeast (EHY) on production performance in dairy cattle.

MATERIALS AND METHODS

One hundred and fifty multiparous cows were balanced to one of three treatment groups (2 pens/trt) according to previous lactation 305 d ME. Cows entered the groups at calving and remained through 14 weeks postpartum. Groups were randomly assigned throughout the barn. Pens were identical in layout and each pen contained an exit alley so that it would not interfere with an adjacent pen when animals were moved for milking.

The three treatments were:

- Control
- Diamond V®XP,™ (XP) manufactured by Diamond V Mills, Inc., supplemented at 56 g/day; and Bio-Mos,® (BM) manufactured by Alltech, Inc., at 10 g/hd/day
- CELMANAX™ supplemented at 28 g/hd/day

The model that was utilized was as follows: μ = mean + trt + period + pen (trt) + trt x period + residual. When treatment effect was significant ($P<0.05$), Tukey-Kramer was used as a means separation test ($P<0.05$).

RESULTS

Mean group dry matter intake was similar across treatments. Milk yield variables were affected by treatment ($P<0.01$). Cows supplemented with CELMANAX produced more ($P<0.05$) milk than Control, with XP+BM not being different from Control or CELMANAX. These same significant production differences were revealed for 3.5 FCM and ECM. Milk fat, SNF or lactose percentages were not affected ($P>0.05$) by treatment. However protein was higher ($P<0.05$) for cows supplemented with CELMANAX than XP+BM, with Control not being different than either. Differences in fat, protein, and SNF yields were primarily reflective of milk yield ($P<0.05$). There was a Pen (trt) effect ($P<0.05$) for fat yield. There was no effect of treatment on MUN. Somatic cell count was lower ($P<0.01$) for cows supplemented with XP+BM and CELMANAX compared to Control, however, there was a Pen (trt) effect ($P<0.05$).

CONCLUSION

Cows supplemented with CELMANAX™ produced more milk, FCM and ECM than nonsupplemented cows. Milk protein percentage was higher for cows supplemented with CELMANAX compared to XP+BM. Protein yields were higher for CELMANAX supplemented cows compared to Control and XP+BM. Somatic cell count was lower for cows supplemented with CELMANAX and XP+BM; however, there was a significant Pen (trt) effect.

TABLE 1 Effect of CELMANAX on Group DMI and Milk Yield

	Treatments				*P*
Item	**Control**	**XP+BM**	**CELMANAX**	**SEM**	**Trt**
N (Pen 1+2)[1]	47.00	50.00	48.00		
DMI, lb	55.10	55.40	55.60		
Milk, lb	89.30[b]	90.80[ab]	92.70[a]	0.70	0.01
3.5 FCM, lb[2]	91.60[b]	93.90[ab]	95.70[a]	0.80	0.01
ECM, lb[3]	90.10[b]	92.10[ab]	94.40[a]	0.70	0.01

[1] Pen (trt) effects for all variables were non significant ($P>0.05$)
[2] 3.5% FCM = 0.4324 (lb milk) + 16.218 (lb milk fat)
[3] Energy-corrected milk was calculated by the following equation: ECM = (kg milk x 0.327) + (kg milk fat x 12.95) + (kg protein x 7.2)
[ab] Means within the same row with different superscripts differ ($P<0.05$) by Tukey-Kramer test

TABLE 2 Effect of CELMANAX on Milk Composition and Yield

	Treatments				*P*
Item	**Control**	**XP+BM**	**CELMANAX**	**SEM**	**Trt**
Composition					
Fat, %[1]	3.67	3.73	3.72	0.04	NS
Protein, %	2.91[ab]	2.89[b]	2.98[a]	0.01	0.01
Lactose, %	4.67	4.65	4.66	0.02	NS
SNF, %	7.58	7.54	7.64	0.04	NS
Component Yields					
Fat, lb[1]	3.26[b]	3.37[ab]	3.43[a]	0.03	0.02
Protein, lb	2.58[b]	2.60[b]	2.74[a]	0.02	0.01
SNF, lb	6.74[b]	6.84[b]	7.06[a]	0.04	0.01
Other					
MUN	11.10	11.50	11.20	0.12	NS
SCC, x1000[1]	241.00[a]	203.00[b]	178.00[b]	13.00	0.01

[1] Significant ($P>0.05$) Pen (trt) effect
[ab] Means within the same row with different superscripts differ ($P<0.05$) by test

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1 Adapted from the data of J. Nocek, Ph.D., Spruce Haven Farm and Research Center, New York and published in *J Dairy Sci* 2011;94:4046–4056.