NUTRITION NOTES
Innovation + Research from Kent Nutrition Group 11.30.18

INFLUENCE OF KENT NATURAL YEAST ON RUMEN DYNAMICS

Before digging into the influence Kent Natural Yeast (KNY) has on rumen dynamics, it should be noted that not all yeasts are created equally. Therefore, function and impact on animal performance differs between the various yeast products available on the market. Research findings reported in this **Nutrition Notes** describe KNY only and should not be extrapolated onto other yeast or yeast culture products.

Kent Natural Yeast is a killed, brewers yeast supplement that has undergone full alcohol fermentation at the brewery before undergoing a proprietary manufacturing process. The KNY product formula is unique, and only found in our bags. The unique formula, type of brewers yeast, and manufacturing process all contribute to making KNY the most palatable yeast available. Its nutrient profile, biologically available vitamins and minerals, and unique metabolites contribute to its overall function and ability to support immune and gut health in all species' diets.

This **Nutrition Notes** focuses on the evaluation of KNY in fermenters with a continuous culture of rumen microorganisms. Research was done using an independent third party, at a University setting. Our objectives were to evaluate the effects of KNY on short chain fatty acids (SCFA), methane output, ammonia concentrations, and pH.

Research Results

Results indicated microbial physiology was altered by shifting fermentation from predominantly an acetate population to an increased propionate population. Propionate is associated with increased capture of carbon that is usually lost as methane. When this occurs, it often results in an overall increase in animal efficiency.

Data also reported methane production was reduced in diets containing KNY. These findings may correlate with the SCFA data reported in the previous paragraph. This correlation may be due to the possibility of capturing the carbon that is usually lost as methane.

Lastly, the inclusion of KNY in the diet tended to inhibit the decline in ruminal pH often associated with diet transition to high concentrates. Diets containing KNY had a gradual change in pH, whereas diets without KNY had a more drastic change in pH during times of diet transition. This drastic change in pH is often associated with acidosis and other health challenges. The presence of KNY in the diet also tended to reduce the concentrations of ammonia-N in ruminal cultures.

Short chain fatty acid data is presented in Table 1, while pH, ammonia and methane data is presented in Table 2.

Table 1. Short Chain Fatty Acids (molar %) in Continuous Cultures of Ruminal Microorganisms Receiving a Diet With or Without the Addition of KNY

	Control Period[1]			Transition Period[2]			Treatment Period[3]		
	-KNY	+KNY	SE	-KNY	+KNY	SE	-KNY	+KNY	SE
Total VFA, mM	44.7	49.8	11.66	59.4	54.1	5.83	70.4	67.3	5.83
Individual VFA mol/100mol									
Acetic	59.2	59.6	2.40	56.2	54.7	1.20	46.3**	42.4**	1.20
Proprionic	22.6	22.2	1.62	23.3	24.6	0.81	35.4*	37.8*	0.81
Isobutyric	0.46	0.49	0.23	0.44	0.40	0.13	0.37	0.37	0.11
Butyric	12.3	12.4	1.25	13.8	14.2	0.63	9.6	10.4	0.63
Isovaleric	2.0	1.9	0.85	2.6	2.5	0.42	3.3	3.7	0.42
Valeric	2.9	2.9	1.68	3.6	3.6	0.84	4.8	5.0	0.84
A:P Ratio	2.7	2.7	0.21	2.5	2.3	0.10	1.3	1.1	0.10

* Means within a period differ at P < 0.06

** Means within a period differ at P < 0.04

[1] Control Period – Both fermenters were maintained on a 100% hay diet

[2] Hay was gradually replaced over 4 days with a control diet without yeast (-KNY) or with yeast (+KNY)

[3] 100% control diet without yeast (-KNY) or with yeast (+KNY)

Table2. Effect of Diet With or Without KNY on pH, Ammonia and Methane in Continuous Cultures of Rumen Microorganisms

	Control Period[1]			Transition Period[2]			Treatment Period[3]		
	-KNY	+KNY	SE	-KNY	+KNY	SE	-KNY	+KNY	SE
Rumen culture pH	6.46	6.52	0.40	5.85	5.91	0.20	5.41	5.6	0.20
Ammonia N mg/100ml	24.0	26.3	3.62	25.0	23.8	1.81	25.4	23.9	1.81
Methane nmoles/ml	561.8	487.8	69.8	621.7	546.5	34.9	344.6	264.7	34.9

[1] Control Period – Both fermenters were maintained on a 100% hay diet

[2] Hay gradually replaced over 4 days with control starter without yeast (-KNY) or with yeast (+KNY)

[3] 100% control starter without yeast (-KNY) or with yeast (+KNY)