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LACTAMUUN®

DAIRY RESEARCH BULLETIN 1

Effects of Lactamuun® on Organic Matter Digestion, Microbial Biomass and VFA Production *in vitro*

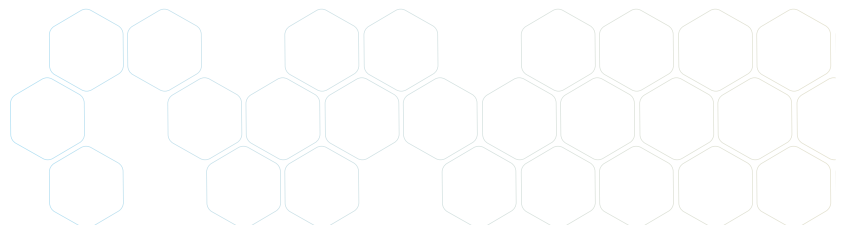
INTRODUCTION

Yeast culture is widely recognized and documented as having rumen-modifying and production-enhancing effects. Though the exact mechanisms have never been fully explained, it is presumed that the nucleotides and amino acids provide readily available nutrient sources for rumen microbes. The extent to which the growth media of yeast culture is of benefit is not known. Lactamuun is comprised of similar yeast components, plus sarsaponin for its VFA-sparing, methane-reducing and anti-protozoal activity, plus a concentrated beta glucan source for its prebiotic- and immune-modulating activity. Lactamuun does not include a carrier, so it offers a highly concentrated source of these beneficial constituents. Formulated products of this type have not been extensively studied for their effects on ruminal fermentation. Consequently, we sought to compare Lactamuun's performance in a rumen fermenter system to a well-documented yeast culture as a positive control, and a negative control of no additives.

METHODS

► In this study, we utilized the Fermentrics™ system (fermentrics.com) to evaluate Lactamuun in comparison to a negative control (no additive), and a positive control (Diamond V® XPC). Fermentrics is a batch-culture, rumen-fluid, gas fermentation system that allows for the differentiation of rapid- and slow-fermenting carbohydrate pools, and the quantification of organic matter digestion (OMD) and microbial biomass production (MBP). Rumen fluid collected from a high-producing Holstein cow was divided into the batch culture vessels.

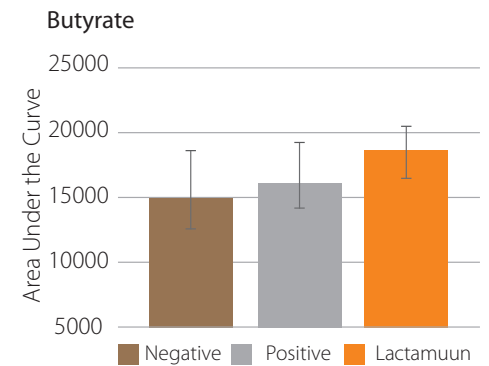
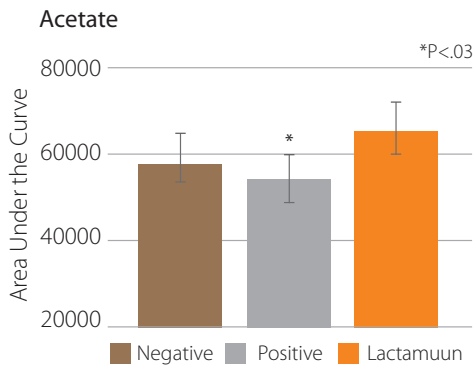
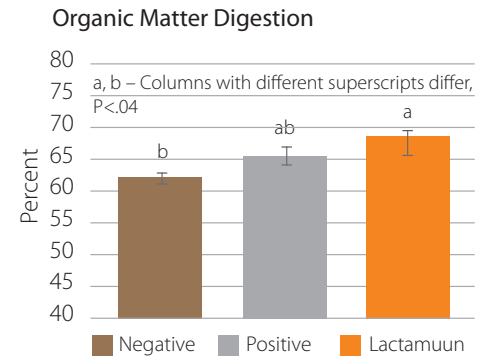
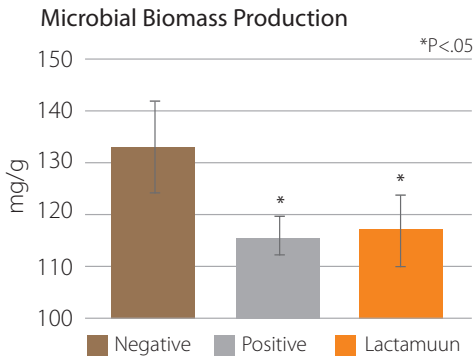
Four hundred mg of a TMR (analysis below) were added to the bottles, which were then sealed and placed in a shaking water bath at 39.5° C. Treatments were added (4 replicates/ treatment and time point), along with the TMR, to each bottle at the following relative feeding rates: Negative Control, 0 g/d; Positive Control, 14 g/d; and Lactamuun at 5g/d. At 12, 24 and 48 hours of incubation, a set of bottles were pulled and the fluid analyzed for: OMD, MBP, acetate, butyrate, isobutyrate, lactate, propionate and valerate. Data were analyzed using ANOVA in JASP.



RESULTS

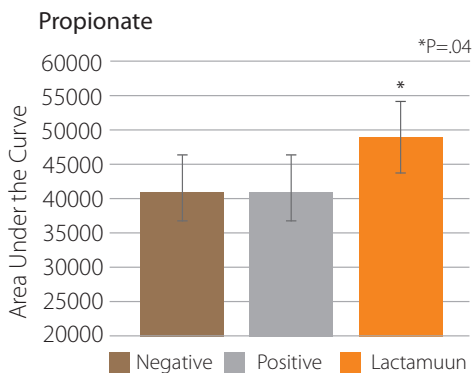
► **Microbial Biomass Production and Organic Matter Digestion** – For MBP, the negative treatment had the highest growth of microbial biomass. Lactamuun contains sarsaponins, which are anti-protozoal, leading to a suppression of total microbial mass. Conversely, Lactamuun had the highest OMD, though not significantly different than the positive treatment. Negative had significantly lower OMD than Lactamuun, though it was not different from positive.

► **VFA Production** – For acetate, the positive treatment was significantly lower than all other treatments ($P=.03$). There was a tendency for Lactamuun to stimulate higher production of butyrate than positive or negative ($P=.095$). Lactamuun significantly increased the production of propionate in comparison to negative and positive ($P=.04$). Isobutyrate, lactate and valerate production did not differ by treatment ($P>.05$).



IMPLICATIONS

In general, Lactamuun had significantly lower MBP than the negative control, but stimulated the highest OMD and VFA production, indicating an increase in fermentation efficiency. Lactamuun can be a cost-effective, low-inclusion rate option to support lactation performance in dairy cows.



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