

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

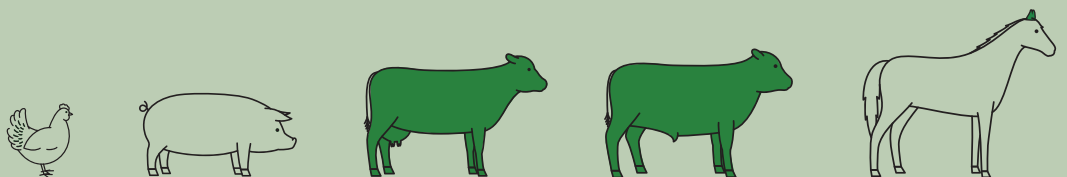


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Lactamuun™





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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.

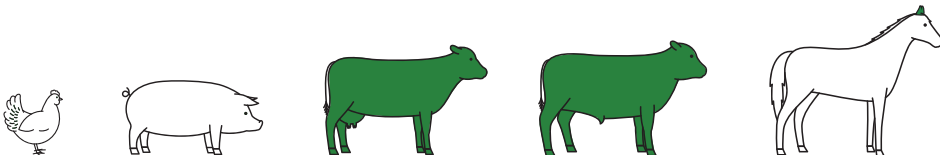
Methods: In this study, we utilized the Fermentrics™ system (www.fermentrics.com) to evaluate Lactamuun in comparison to a negative control (no additive), and a positive control (Diamond V® XPC). Fermentrics is a batch-culture, rumen-fluid, gas-fermentation system which allows for the differentiation 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 is divided into the batch culture vessels. Four hundred mg of a TMR (analysis below) is added to the bottles, which are 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.

THE BOTTOM LINE

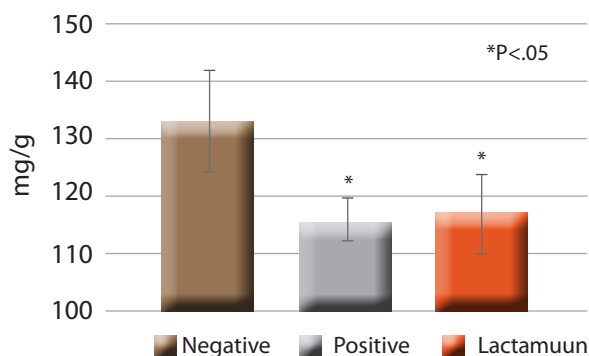
- 1 Lactamuun stimulated the highest Organic Matter Digestion and Volatile Fatty Acid production.
- 2 Lactamuun significantly increased Propionate production.
- 3 Lactamuun can be effective at supporting lactation performance.

TMR Nutrient Analysis

CP - 15.89%	NFC - 40.8%
RUP - 5.35% DM	Sugar - 3.0% DM
RDP - 10.6% DM	Starch - 29.1% DM
Sol. CP - 36.3% CP	Sol. Fib. - 5.8% DM
MP Supply - 2445 g	Ferm. CHO - 43.9%
ADF - 20.2% DM	DM Fat - 3.8% DM
peNDF - 23.5% DM	ME - 2.51 Mcal/kg
Lignin - 3.1% DM	

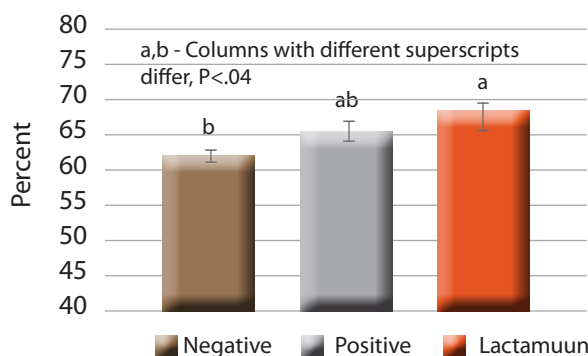


Microbial Biomass Production



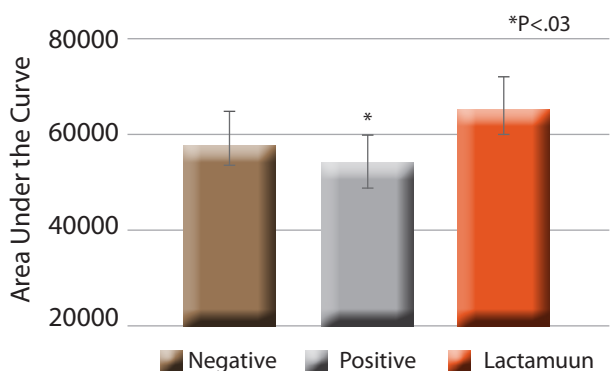
Results: *Microbial Biomass Production and Organic Matter Digestion* - For MBP, the Negative treatment had the highest growth of microbial biomass. Lactamuun contains sarsaponins, which are anti-protozoal, leading to a suppression of total microbial mass. Conversely, Lactamuun had the highest OMD, though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

Organic Matter Digestion



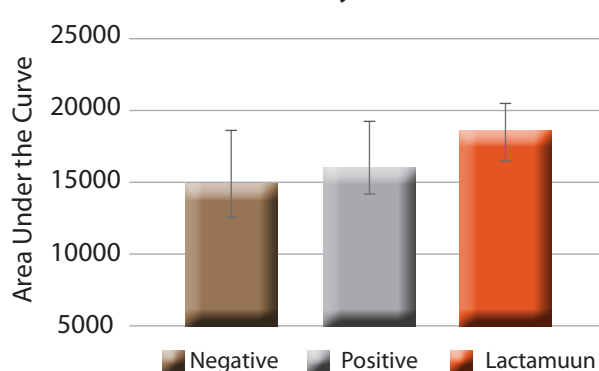
Implications: In general, Lactamuun had significantly lower MBP than the negative control, but stimulated the highest OMD and VFA production, indicating an increase in fermentation efficiency. Lactamuun can be a cost-effective, low-inclusion rate option to support lactation performance in dairy cows.

Acetate

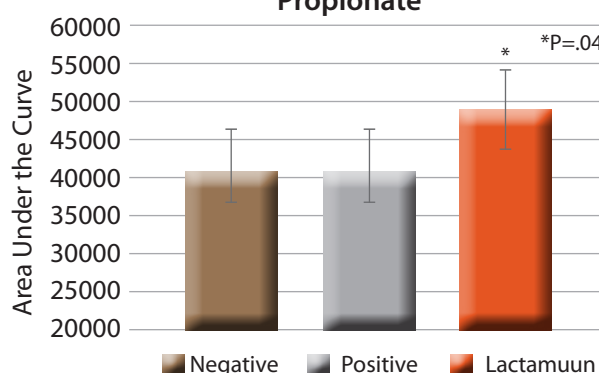


VFA Production - For Acetate, the Positive treatment was significantly lower than all other treatments ($P=.03$). There was a tendency for Lactamuun to stimulate higher production of Butyrate than Positive or Negative ($P=.095$). Lactamuun significantly increased the production of Propionate in comparison to Negative and Positive ($P=.04$). Isobutyrate, lactate and valerate production did not differ by treatment ($P>.05$).

Butyrate



Propionate



Our business is built on Three Pillars which guide every action and decision:

Integrity: Personally, professionally and scientifically, we will always conduct ourselves with the highest principles and transparency.

Innovation: Never settling for the status quo, we will encourage exploration, critical inquiry, flexibility and responsiveness to the needs of our customers and industry.

Improvement: For our industry, our customers and ourselves we will continuously invest in education and professional development.

LACTAMUUN

A unique blend of yeast components and yucca extract. The natural, complex carbohydrates and glycosides improve rumen efficiency and nutrient digestibility while improving nitrogen retention, reducing methane production and supporting immune function. Available in a formulation approved for use in organic livestock production.

OPTIWEAN

A two-phase calf health program providing passive immunity and supporting gut health in Phase 1, then maintaining gut health while supporting rumen and immune system development in Phase 2.

ULTRADTOX

A proprietary formulation of refined bioactive carbohydrates, fermentation extracts and silicates to reduce gut challenges from pathogens and toxins.

BENELAC YC

A highly concentrated, 100% *Saccharomyces cerevisiae* yeast culture with no carriers or fillers.



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