



**EFFECTS OF MICRO-LAC<sup>TM</sup> PLUS ON THE DISAPPEARANCE  
OF DRY MATTER OF SOLKA FLOC (CELLULOSE) AND  
CORN MEAL (STARCH) IN THE RUMEN AND ON THE RUMEN  
pH USING THE NYLON BAG TECHNIQUE**

by  
**STEPHEN MEHEN  
FRANKLIN P. PARKS, Ph.D.**

**INTRODUCTION**

Micro-Lac<sup>TM</sup> is a special blend of *Saccharomyces cerevisiae* (yeast), *Enterococcus faecium* and four strains of *Lactobacillus* (*Acidophilus*, *Plantarum*, *Casei* and *Fermentum*). Large amounts of data existed on yeast cultures fed to ruminates, especially lactating dairy cows. *Enterococcus faecium* and the various strains of *Lactobacillus* appear to work best in the lower gut and large amounts of data exist for the monogastric animal. The combination of these organisms makes Micro-Lac<sup>TM</sup> a total tract feed additive when fed to ruminates.

Micro-Lac<sup>TM</sup> has been successfully used by the dairy nutritionist and dairy feed mills on the West Coast as a feed additive for a number of years. Mehen and Parks, 1995, using the nylon bag technique showed that dry matter disappearance of solka floc (cellulose) in the rumen of steers was improved from 46.84% to 51.55% or a 10.06% increase in an eight hour period when Micro-Lac<sup>TM</sup> was fed. The pH of the rumen was also increased from 6.76 to 7.05 in the same period, or an increase of 4.29%. In the same study, ground corn was decreased from 33.09% to 29.38% or an 11.21% decrease. This indicated that Micro-Lac<sup>TM</sup> apparently increased the number of cellulite digesting microorganisms but decreased the number of starch digesting organisms.

BioTech Associates Ltd., Inc. has recently acquired a new strain of bacillus organism. This organism has been added to Micro-Lac<sup>TM</sup> to form a new product to be marketed soon. BioTech Associates Ltd., Inc. has also made a shift in the proportions of the other organisms which BioTech believes will improve fermentation in the rumen substantially.

## PROCEDURE

One steer fitted with a rumen canula was used in this study. The nylon bag technique was used for the purpose of determining the dry matter disappearance of both solka floc and corn meal.

Three gram samples of solka floc and five gram samples of corn meal were weighed into nylon bags measuring 2" x 4", tied onto a weighted chain and placed in the rumen for a twenty four hour period. All values were determined on a 100% dry basis. Dry matters were done according to AOAC methods.

The animal was fed a ground alfalfa hay (80%) and oatlage (20%) diet (ad libitum) for fourteen days plus one pound of ground corn for the control period. The same diet was fed for the fourteen day test period but 7 grams per day of the Micro-Lac™ Plus was added to the one pound of ground corn. At the end of each period, the dry matter disappearance was determined along with samples of rumen fluid collected and pH's measured. The samples were then frozen for further analysis. A total of fifteen bags were used for both solka floc and corn meal for each period. The data was analyzed using the student T-test. Two different trials were run back to back for a total of fifty six days.

## RESULTS

The results of both trials are shown in Table I for dry matter disappearance of solka floc and corn meal in the rumen.

**TABLE I**  
**% DRY MATTER DISAPPEARANCE IN 24 HOURS**

### *Trial I*

	<u><i>Solka Floc</i></u>	<u><i>Corn Meal</i></u>
<u><b>Control</b></u>	53.18 <sup>a</sup>	89.52 <sup>a</sup>
Micro-Lac™ Plus	81.12 <sup>b</sup>	93.61 <sup>b</sup>
% Improvement	+52.54%	+4.57%
ab	(P .001)	(P .05)

### *Trial II*

Control	48.00 <sup>a</sup>	71.29 <sup>a</sup>
Micro-Lac™ Plus	84.93 <sup>b</sup>	97.19 <sup>b</sup>
% Improvement	+76.94%	+36.33%
ab	(P .001)	(P .001)

### *Summary*

Control	50.59 <sup>a</sup>	80.41 <sup>a</sup>
Micro-Lac™ Plus	83.03 <sup>b</sup>	95.39 <sup>b</sup>
% Improvement	+64.12%	+18.63%
ab	(P .001)	(P .001)

There was a 52.54% improvement in the dry matter disappearance of solka flac in the rumen for Trial I for twenty four hours; 76.94% in Trial II; and an average for both trials of 64.12%. Dry matter disappearance of corn meal was improved by 4.57% for Trial I; 36.33% for Trial II; and 18.63% average for both trials.

The rumen pH's for both trials are shown in Table II.

**TABLE II**  
**RUMEN pH**

	<b>TRIAL I</b>	<b>TRIAL II</b>	<b>SUMMARY</b>
Control	6.52	6.91	6.77
Micro-Lac <sup>TM</sup> Plus	6.69	6.92	6.79

Although there was a numerical increase in pH for Micro-Lac<sup>TM</sup> Plus over the control in Trial I, there was no significant difference in Trial II or the summary of both trials.

### **DISCUSSION**

The Micro-Lac<sup>TM</sup> Plus shows a very large improvement in the dry matter disappearance of solka floc, 64.12% in the rumen over the control. This increase, when compared to the old data (+10.06%) collected on Micro-Lac<sup>TM</sup> before the shift in proportions of organisms and the addition of the new strain of bacillus, shows a marked improvement. Also, the improvement of 18.63% of the dry matter disappearance of corn meal compared to an 11.21% decrease.

When comparing the pH data of Micro-Lac<sup>TM</sup> versus the Micro-Lac<sup>TM</sup> Plus, there was an increase for Micro-Lac<sup>TM</sup>, but none for the Micro-Lac<sup>TM</sup> Plus. The increase in dry matter disappearance of corn meal, +18.63% for the new and -11.21% for the original, could account for the lack of increase in pH for the Micro-Lac<sup>TM</sup> Plus in this study. The original Micro-Lac<sup>TM</sup> data indicated that it may increase the cellulose digesting organisms and decrease the starch digesting organisms in the rumen. The researcher theorizes that the very large increase in dry matter disappearance of solka floc (cellulose), 64.12%, and the large increase in dry matter disappearance of corn meal (starch) in this study of Micro-Lac<sup>TM</sup> Plus with no change in pH might maximize fermentation in the rumen by increasing both the cellulose digesting organisms and the starch digesting organisms. Both starch and cellulose disappearance was improved. The researcher also theorizes that there should be an improvement in the total digestion of the ration. This could mean that there is an increase in total volatile fatty acids in the rumen. This could also mean an increase in milk production without altering the proportion of solids in the milk.

Another theory could be that there is an increase in the rate of passage due to the improved fermentation which could lead to an improvement in propionic acid, which would improve nonfat solids.

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## CONCLUSION

The ground floor evidence of an improvement in both cellulose and starch disappearance in the rumen has been generated. The Micro-Lac™ Plus will be the leading microbial of the 21st Century. BioTech Associates Ltd., Inc. is dedicated to the improvement in the future of animal feed and biotechnology for the feed industry.

## LITERATURE

Effects of Micro Lac™ (Saccharomyces Cerevisiae, Streptococcus Faecium, And Four Strains Of Lactobacillus [Acidophilus, Plantarum, Casei, And Fermentum]) On Rumen pH And Dry Matter Disappearance Of Ground Corn (Starch) And Solka Floc (Cellulose) In The Rumen Using The Nylon Bag Technique. Stephen Mehen and Franklin P. Parks, Ph.D., 1995.

BioTech Associates Ltd., Inc.  
P.O. Box 3726  
Pinedale, CA 93650-3726  
800-400-BTA1 (2821)

The Mehen Company  
P.O. Box 215  
New Meadows, ID 83654  
(209) 347-2114