

# Research Notes

Arm & Hammer Animal Nutrition

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## BIO-CHLOR® Increases Crude Protein Digestion by 30%, Improves Bacterial Protein Production and Rumen Performance

A summary of research data generated by the Rumen Fermentation Profiling Laboratory at West Virginia University that compares the effect of BIO-CHLOR® on transition rations compared to a commercial anion source.

### KEY POINTS

- BIO-CHLOR safely lowers close-up DCAD levels without the negative effects demonstrated when anionic salts are fed in the prefresh diet.
- BIO-CHLOR promotes rumen bacterial growth, lowering ration protein needs and total ration costs.

### STUDY OVERVIEW

New West Virginia University research<sup>1</sup> evaluated three different diets to compare their influence on bacterial growth and metabolism. All three diets were fed on an equal nitrogen basis and the same composition except for the protein source. The three protein sources were:

**Control:** Soybean meal (SBM)

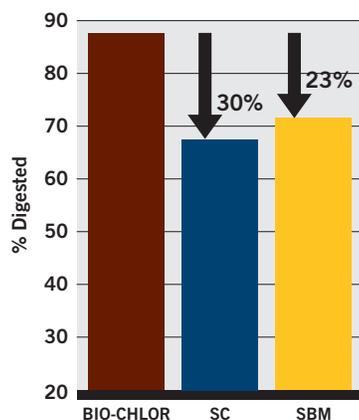
**Treatment 1:** BIO-CHLOR® Rumen Fermentation Enhancer

**Treatment 2:** SoyChlor® (SC)

#### CRUDE PROTEIN DIGESTIBILITY

BIO-CHLOR:

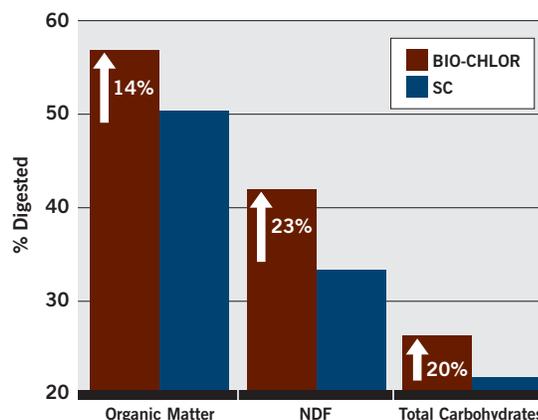
- Outperformed soybean meal in crude protein digestion
- Performed similarly to soybean meal in digestibility of all other nutrients



#### NUTRIENT DIGESTIBILITY BY TREATMENT

BIO-CHLOR outperformed SC in digestibility of:

- Organic matter
- Neutral Detergent Fiber (NDF)
- Total carbohydrates

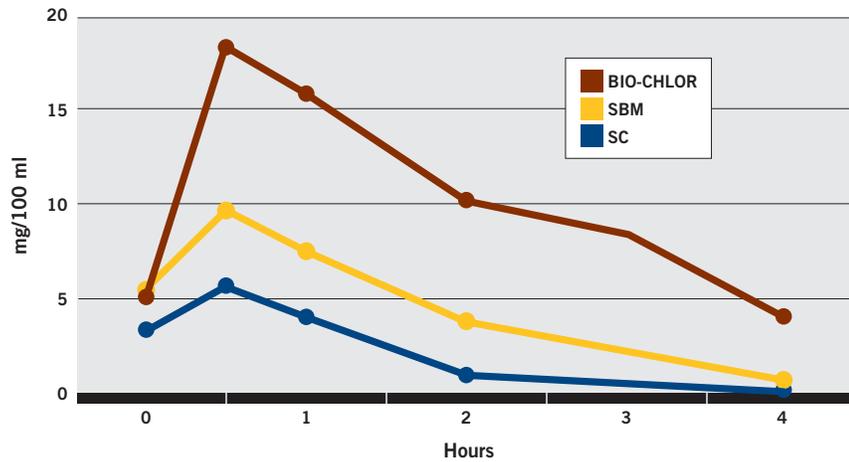


## Rumen ammonia levels

The rumen requires ammonia levels of 8 to 10 mg/100 ml for microbes to efficiently break down feed.

- **BIO-CHLOR maintained optimal levels for three hours** while the SBM diet sustained optimal levels for only 1.25 hours after feeding.
- SC was unable to sustain ammonia levels, providing partial explanation for why SC digested significantly fewer carbohydrates.

AMMONIA-NITROGEN CONCENTRATION FOLLOWING FEEDING



## Rumen Efficiency

- BIO-CHLOR improved bacterial growth resulting in a **14% increase in bacterial efficiency** when compared to SBM.
- SC also increased bacterial efficiency (grams of bacterial protein per gram of carbohydrate fermented) similarly to BIO-CHLOR, but due to the reduced amount of carbohydrates digested when SC was used, 14% less total bacterial protein was produced when compared to BIO-CHLOR.
- **BIO-CHLOR increased digestion of carbohydrates and fiber by at least 20%** when compared to SC.

## CONCLUSIONS

Researchers concluded that BIO-CHLOR significantly increased bacterial protein production due to greater bacterial growth and nutrient digestion when compared to the other two diets.

## APPLICATIONS OF RESEARCH FINDINGS

- BIO-CHLOR is more effective than SoyChlor and commodity protein sources in delivering bacterial protein. This results in less additional protein needed in the ration because BIO-CHLOR provides a high-quality source of key limiting amino acids, like methionine and lysine.
- BIO-CHLOR is more efficient at digesting protein, organic matter, NDF and carbohydrates than SoyChlor. This results in more available nutrients from fewer pounds of feed.
  - Close-up rations formulated with BIO-CHLOR will be more cost-effective than SoyChlor.
- BIO-CHLOR is the most effective protein and anion source for:
  - Delivering a palatable anion source that safely lowers close-up ration DCAD.
  - Assisting with the transfer of calcium from bone to blood, helping reduce incidence of costly metabolic disorders, especially milk fever.
  - Maintaining DMI in the close-up pen, resulting in transition cows successfully joining the milking string with fewer uterine health disorders.

**Consult your ARM & HAMMER® representative or your nutritionist for advice on formulating rations with BIO-CHLOR.**

1 Miller-Webster TK, Hoover WH. Rumen Fermentation Profiling Laboratory Study, West Virginia University, 2008. Data on file.

