

# CMC, INC.

## CONSULTING TO THE FOOD & RELATED INDUSTRIES

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December 5, 2011

Mr. Dennis Crabtree  
Chief Technology Officer  
BioStar Systems, LLC  
Organic Waste Management & Renewable Energy  
100 E. Seventh Street, Suite 400  
Kansas City, MO 64106-1412

Dear Dennis:

We have completed the inoculation study on the product identified as follows (reference CMC Lab # 4929).

<b><u>Sample ID:</u></b>	<b><u>pH:</u></b>
Super Six 6*0*5 Organic Liquid Fertilizer	6.43

This study was undertaken in order to determine the fate of generic E. coli, E. coli O157:H7, Listeria species and Salmonella species when inoculated into the above product. The product was inoculated separately with each of the four organisms and then tested at three different exposure times (1 minute, 24 hours and 48 hours). Cultures were prepared in suspension and then a separate aliquot of each culture was inoculated into the product. It was determined that the initial baseline counts were as follows:

1) Generic E. coli:	6.4 x 10 <sup>6</sup> cfu/ml
2) E. coli O157:H7:	5.6 x 10 <sup>6</sup> cfu/ml
3) Listeria:	6.2 x 10 <sup>6</sup> cfu/ml
4) Salmonella:	6.0 x 10 <sup>6</sup> cfu/ml

The inoculated samples were mixed, serially diluted and plated at a 1 minute exposure time. The inoculated samples were then held for an additional 24 hours and 48 hours stored at ambient temperature and plated accordingly. Uninoculated samples served as controls.

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The results of this study indicate that there was a >5-log reduction (<1 cfu/ml) for all four organisms after 24 hours stored at ambient temperature.

**Based on these results, your product was effective in achieving a >5-log reduction against the four organisms tested after 24 hours. A minimum of 48 hours hold time before distribution is required in order to eliminate the survival of generic E. coli, E. coli O157:H7, Listeria and Salmonella.**

**This study only applies to raw material obtained from Biostar Systems, LLC**

**Any other suppliers are not qualified under this study.**

This hold period will ensure that if viable public health significant microorganisms were present in your products they would not survive prolonged exposure to the formula tested. Obviously, any changes to your process or raw materials may adversely impact these findings.

**DISCLAIMER STATEMENT:**

**The results of this single, bench-top study are applicable only to the process parameters and pH values of the product that was tested in this study. Any deviations to the process, pH values or product that was not part of this study may represent conditions whereby public health significant microorganisms may survive.**

If you have any questions, please contact me.

Sincerely,



Al Branch,  
Microbiologist  
CMC, INC.