

BACTERIAL CONTAMINANTS OF FUEL ETHANOL FACILITIES

K. Bischoff, T. Leathers, S. Liu, and J. Rich

Bioproducts and Biocatalysis Research, National Center for Agricultural Utilization
Research, ARS-USDA, 1815 N. University Street, Peoria, IL 61604, USA

Strains of lactic acid bacteria that were isolated from commercial ethanol fermentation facilities are available for modeling bacterial contamination and for testing new antibacterial agents. Bacterial contamination is a continual problem in commercial fermentation cultures, particularly in fuel ethanol fermentations, which are not run under pure-culture conditions. Chronic bacterial infections create a constant drain on sugar available for conversion to ethanol and they compete for micronutrients needed by yeast. Acute infections occur unpredictably and can lead to “stuck” fermentations that require facilities to be shut down for cleaning and result in expensive down times. Antibiotics are used to treat and control bacterial infections, but the emergence of resistant strains and regulatory concerns over drug residues in the distillers’ grains may limit their future use. New methods to control bacterial infections are needed. We have isolated a unique collection of bacterial strains from normal-operating commercial ethanol facilities and from those experiencing acute contamination problems. The strains have been characterized genotypically and phenotypically for species identification, antibiotic susceptibility, and biofilm formation. We have incorporated our strains into laboratory models of “stuck” fermentations and developed methods for measuring biofilms. These strains and methods are available to collaborative partners who are interested in understanding the fundamental nature of bacterial contamination and in developing new intervention strategies that control bacterial contamination.

Contact: Ken Bischoff, Bioproducts and Biocatalysis Research, NCAUR-ARS-USDA, 1815 N. University Street, Peoria, IL 61604, USA. Tel: 309-681-6067. E-mail: Kenneth.Bischoff@ars.usda.gov.