

## Abstract

**THESIS PROJECT:** Detection of *nheA* from *Bacillus* spp. in Food and Soil

Isolates Using Real-time and Rep-PCR

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**DATE:** July, 2011

**PAGES:** 60

*Bacillus cereus* is traditionally thought to be the only member of its genus accepted as a pathogen in foods like grains, fruits, vegetables and milk due to the presence of the nonhemolytic (Nhe) operon. However, many other *Bacillus* spp. may also harbor the Nhe operon and be pathogenic. Real-time PCR targeted the *nheA* gene in 37 samples obtained from food, soil, and reference cultures by analyzing the standard deviations of melt peaks. Rep-PCR was used to compare the banding patterns of each sample against *B. cereus* ATCC14579 and three *B. thuringiensis* strains to “fingerprint” each isolate. Of the original 43 isolated tested, 37 were Gram-positive rods. The remaining six samples were Gram-positive cocci. Twenty-five of the 37 Gram-positive *Bacillus* spp. were *nheA* positive, while twelve were negative. Many of the *nheA* positive strains were species not previously known to contain Nhe, and were capable of causing gastroenteritis in consumers.