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# Heat resistance of spores of six major *Bacillus* species in phosphate buffer and fermented soybean products

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The aim of this study was to compare the heat resistance of *Bacillus cereus* spores with that of spores of dominant *Bacillus* species present in fermented soybean products and thereby optimize thermal treatment conditions of fermented soybean products to reduce risk of *B. cereus* contamination. For this, heat resistance of spores of six different species belonging to the genus *Bacillus* including *B. subtilis, B. coagulans, B. licheniformis, B. pumilus* and *B. brevis* as well as *B. cereus* was measured in a phosphate buffer. Consequently, *B. cereus* spores revealed the smallest D-values at all the tested temperatures of 100-112°C whereas *B. licheniformis* spores had the greatest D-values at temperatures in the range of 106-112°C. The spores of the other dominant *Bacillus* species showed similar or slightly smaller D-values than those of *B. licheniformis* at respective temperatures. Subsequently, heat resistance of spores of six species was determined in two types of fermented soybean products, Cheonggukjang and Gochujang products. In the fermented soybean products *B. licheniformis* spores revealed the greatest D-value at 112° C and one of either *B. coagulans* spores or *B. brevis* spores exhibited the greatest D-values at temperatures in the range of 103-109°C whereas *B. cereus* spores showed the smallest D-values at all the tested temperatures. Meanwhile, *B. licheniformis* spores had the highest z-values in both phosphate buffer and fermented soybean products followed by *B. cereus* spores. These results indicate that a mild thermal treatment would allow species-selective inactivation of *B. cereus* spores, less affecting spores of the other *Bacillus* species.

## Biography

Jae-Hyung Mah has completed his PhD from Korea University and Postdoctoral studies from University of Wisconsin-Madison and Washington State University. He is the Professor of Food and Biotechnology at Korea University (Sejong Campus). He has published more than 40 papers in reputed journals and has been serving as an Editorial Board Member of several peer-reviewed journals. His researches focus on the analyses of hazardous chemicals and microorganisms in fermented foods and development of novel protective and preservative strategies such as application of genetically designed starter culture to food fermentation and inactivation kinetics of pathogenic microorganisms exposed to intervention treatments.

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