



# Bacillus cereus: diversity and adaptation to conditions in the food chain

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*Bacillus cereus*: diversity and adaptation to conditions in the food chain.

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*Bacillus cereus* accounts for some of the most common foodborne poisonings. Reports of *Bacillus cereus* outbreaks in Europe (including very severe emetic outbreaks) markedly increased in recent years. Spores of *B. cereus* are widely dispersed in the environment and contaminate any sort of foods. With *Clostridium botulinum* and *C. perfringens*, *B. cereus* is a concern for mildly heat-processed foods because of spore resistance and many strains have the ability to multiply at refrigeration temperature. The phenotypic diversity of *Bacillus cereus* strains has been established long ago. Recently a robust description of the genetic structure of the whole group has been provided and defined seven genetic groups. With respect to food safety, these groups numbered I-VII have different growth temperature profiles, and also differ by their involvement in foodborne poisoning incidents, production of toxins causing poisonings, resistance to heat, adaptation to low pH or to low  $a_w$ , etc... For instance most cereulide-producing strains are distributed in phylogenetic group III that also contains the most heat-resistant strains. The “diarrhoeic potential” is low for psychrotrophic group VI strains, while it is higher for mesophilic groups III and IV, which is consistent with the prevalence of foodborne disease strains in the groups. A procedure to identify a *B. cereus* strain in the seven phylogenetic groups has been proposed. The risk for consumers of *B. cereus* foodborne poisonings should be considered with respect to the type of strains present in foods.