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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 aw, 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.