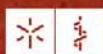


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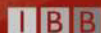


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The antimicrobial effect of wine on *Bacillus cereus* in simulated gastrointestinal conditions**Miguel Vaz, Tim Hogg, José António Couto**

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Several studies demonstrate the antibacterial properties of wine against relevant food-borne pathogenic bacteria but none of them studied the effect on *Bacillus cereus*, a spore-forming bacterium that is a common contaminant in a wide variety of foods. Two distinct food-borne disease types are associated with *B. cereus*: the intoxication, or emetic syndrome (caused by a toxin produced in the food prior to consumption) and the toxic-infection, or diarrheal syndrome (caused by enterotoxins produced in the small intestine). This study aimed to evaluate the antimicrobial activity of wine against *B. cereus* vegetative cells and spores. The results clearly show that wine exerts a strong inactivation effect against vegetative cells of *B. cereus*. The red wine tested inactivated stationary phase cultures to undetectable numbers in less than 10 s. Thus, further inactivation assays were carried out with wine diluted with water (1:4 and 1:8). Diluted wine 1:4 caused a reduction of approximately 5 log cycles on viable cell counts in 20 s. On the other hand, *B. cereus* spores were found to be highly resistant to wine exposure. The influence of wine components (organic acids, ethanol and phenolic compounds) was investigated on vegetative cells. The wine organic acids tested exhibited a strong inactivation effect, and, when combined with ethanol, a slight synergistic effect was observed. The wine phenolic compounds assayed displayed no activity against the vegetative cells at the concentrations tested. At the simulated gastric conditions studied (in the presence of food), wine diminished considerably the number of *B. cereus* viable cells supplementing the effect of the synthetic gastric fluid. The behavior of *B. cereus* spores under gastrointestinal conditions was also evaluated. In a consumption-like scenario, the addition of wine led to lower total counts (vegetative cells + spores) of *B. cereus* in the simulated intestine conditions, showing that wine inhibits the proliferation of the vegetative cells obtained from the germination of spores. This work provides evidence that consumption of wine during a meal may diminish the number of viable cells of *B. cereus* and reduces the impact of the germination of spores that may occur in the small intestine.