Estimation of the growth kinetic parameters of *Bacillus cereus* spores as affected by pulsed light treatment

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Abstract

Quantitative microbial risk assessment requires the knowledge of the effect of food preservation technologies on the growth parameters of the survivors of the treatment. This is of special interest in the case of the new non-thermal technologies that are being investigated for minimal processing of foods. This is a study on the effect of pulsed light technology (PL) on the lag phase of *Bacillus cereus* spores surviving the treatment and the maximum growth rate (μ_{max}) of the survivors after germination. The *D* value was estimated as 0.35 J/cm^2 and our findings showed that PL affected the kinetic parameters of the microorganism. A log linear relationship was observed between the lag phase and the intensity of the treatment. Increasing the lethality lengthened the mean lag phase and proportionally increased its variability. A polynomial regression was fitted between the μ_{max} of the survivors and the inactivation achieved. The μ_{max} decreased as intensity increased. From these data, and their comparison to published results on the effect of heat and e-beam irradiation on *B. cereus* spores, it was observed that the shelf-life of PL treated foods would be longer than those treated with heat and similar to irradiated ones. These findings offer information of interest for the implementation of PL for microbial decontamination in the food industry.