

UV-C Dose Response of *Cronobacter sakazakii* Using Low Pressure Collimated Beam Device

Abstract: The food industry is always looking for novel and improved technologies to enhance food safety. The ultraviolet light is one of these technologies. In fact, UV-C has been shown to inactivate pathogens in liquid medium and has been used for some time to sterilize water. *Cronobacter sakazakii* is a Gram negative bacteria which can survive under very dry conditions. It has been implicated in several outbreaks of infant milk formula. The main objective of this study is to establish the range of D_{10} values for *Cronobacter sakazakii* in buffer (PBS), using a low pressure collimated beam device which emits UV irradiation at a wavelength of 254 nm. Samples were stirred for uniform UV exposure during treatments. A total of 13 strains of *Cronobacter* spp. (10 *C. sakazakii*, 2 *C. muytjensii* and 1 *C. dublinensis*) were treated in PBS with six doses of UV light (0,2,4,6,8 and 10 mJ/cm²). The D_{10} values for the 10 strains of *C. sakazakii* ranged from 2.11 to 3.14 mJ/cm², 2.08 – 2.63 mJ/cm² for two strains of *C. muytjensii* and 3.22 mJ/cm² for one strain of *C. dublinensis*. There was significant strain to strain variability. Bacteriophages MS2 (max. dose 100 mJ/cm²) and T7 (max. dose 10 mJ/cm²) were used for biodosimetry calculations. This study provides a scientific basis for further research examining the use of UV-C irradiation for inactivation of *C. sakazakii* in high opacity liquid like milk (full fat), which contains high level of suspended and dissolved solids, using a flow through Medusa UV reactor.

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