

High Intensity Light Pulses to reduce microbial load in fresh cheese

Valentina Lacivita¹, Amalia Conte^{1,2*}, James G. Lyng³, Cristina Arroyo³, Vittorio A. Zambrini⁴,

Matteo A. Del Nobile^{1,2}

¹Department of Agricultural Sciences, Food and Environment, University of Foggia, Via Napoli, 25 - 71122 Foggia, Italy

²Services Center of Applied Research - University of Foggia, Via Napoli, 25 - 71121 Foggia, Italy

³UCD Institute of Food and Health, University College Dublin, Belfield, Dublin 4, Ireland

⁴Department of Quality, Innovation, Safety, Environment, Granarolo S.p.A., Via Cadriano, 27/2-40127 Bologna, Italy

Short title: Non-thermal technology applied to fresh cheese

*** Corresponding Author:**

Amalia Conte

*Department of Agricultural Sciences,
Food and Environment, University of Foggia,
Via Napoli, 25 - 71122 Foggia, Italy
Tel.: +39 0881 589 240;
E-mail address: amalia.conte@unifg.it*

Summary

The present study focused on the utilization of High Intensity Light Pulses (HILP) treatment to preserve mozzarella cheese. First, the susceptibility of *Pseudomonas fluorescens* and Enterobacteriaceae to HILP (fluences from 0.39 to 28.0 J/cm²) in a transparent liquid was evaluated (*in-vitro* tests). Afterwards, the effects on inoculated mozzarella cheese were also assessed. Then untreated (Control) and HILP treated samples were packaged and stored at 10 °C for two weeks. Enterobacteriaceae, *Pseudomonas* spp. and pH were monitored during storage. In a transparent liquid (*in-vitro* tests) there was a significant microbial inactivation just with 2 s of treatment. On the inoculated cheese a relevant microbial reduction of about 1 log cycle was observed, according to the exposure to the treatments. For *Pseudomonas* spp. in particular, in the treated samples, the microbiological acceptability limit (10⁶ cfu/g) was never reached after 2 weeks of refrigerated storage. To sum up, the efficacy of this treatment is very interesting because a microbial reduction was observed in treated samples. HILP treatment is able to control the microbial growth and may be considered a promising way to decontaminate the surface of mozzarella cheese.