

Title:

**Chemical Treatments Impact on Safety and Quality of Frozen Red Bell Pepper
(*Capsicum annuum*, L.)**

Authors & affiliations:

*Elisabete M.C. Alexandre[#], Dora M. Santos, Teresa R. S. Brandão, Cristina L.M. Silva**
Escola Superior de Biotecnologia, Universidade Católica Portuguesa
Rua Dr. António Bernardino de Almeida
4200-072 Porto, Portugal

[#] *presenting author*

**corresponding author E-mail: clsilva@esb.ucp.pt*

Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

The high loads of some microorganisms in fresh fruits and vegetables, as well as the high probability of products contamination along manufacturing, justify treatments application in a phase prior to storage (both in refrigeration or frozen conditions). Thermal pre-treatments, such as blanching, are extensively used aiming at maximum safety and quality retention of frozen products. Alternatively, chemical treatments may be used as disinfectant washings of fruits and vegetables, avoiding the negative impact of the thermal treatments, while assuring safety from a microbiological point of view. Traditionally, hydrogen peroxide and chlorine solutions are used as decontamination agents.

The objective of this work was to study the impact of two disinfectant solutions (sodium hypochlorite - used in a commercial available solution AMUKINA; and hydrogen peroxide at two different concentrations (1% and 5% w/w)) on safety (evaluated by *Listeria innocua* artificially inoculated on red bell peppers, *Capsicum annuum*, L.) and on some quality attributes (pH, colour and texture) throughout 87 days of frozen storage conditions (at -7°C and -30°C). Simple water-washings were used as control.

When red bell peppers were washed in water or in disinfectant solutions, the results were similar in terms of *Listeria innocua* reduction (at -7 and -30 °C). However, if samples were stored un-washed, the microbiological contamination was higher (approximately 2 log-cycles throughout all storage and at both temperatures). This emphasis the importance of a simple water-washing to make the frozen product safer. The great impact of the disinfectant washings in terms of quality evaluation was observed on colour. When hydrogen peroxide (at 1%) or AMUKINA were used, colour was better retained during frozen storage at both temperatures. The other quality parameters were not affected by the applied washing treatments.

Keywords: vegetables, quality, safety, chemical treatments