



FIRST EUROPEAN FOOD CONGRESS

Food Production • Nutrition • Healthy Consumers

4-9 November 2008 • Ljubljana, Slovenia

Delegate Manual

Organized by



Administration by



Gold Sponsor

JohnsonDiversey



www.foodcongress.eu

Keywords: french fries, dry matter, fat uptake

[P194]

Heat Treatment Effects on Physical-chemical and Microbiological Quality of Whole Tomato (*Lycopersicum esculentum* L.) Fruit during Storage

Joaquina Pinheiro^{*1}, Carla Alegria², Marta Abreu², Isabel Fernandes², Elsa M. Gonçalves², Cristina L.M. Silva¹

¹Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Portugal, ²Instituto Nacional de Engenharia, Tecnologia e Inovação, Portugal

Tomato is a typical climacteric fruit, which is characterized by a rapid softening, change in colour and fungal development, once the ripening process is initiated. These quality changes can be a limitation for the product shelf-life and commercialization.

Recently, studies on postharvest treatments, namely heat treatments (HT), applied on different whole fruits and vegetables demonstrated a decay control and a positive effect on the ripening process (1,2,3).

The aim of the present work was to evaluate HT (42°C/30min) effects on quality attributes such as colour CIE Lab, texture (maximum force, N), pH, soluble solids content (SSC), peroxidase activity (POD, Abs.min.ml⁻¹), pectinmethylesterase activity (PME, Abs.min.ml⁻¹) and moulds and yeasts counts of whole tomatoes (untreated and heat treated), at two ripening stages (turning and pink), during storage at 7°C, 85% RH for 14 days.

Immediately after HT significant ($p < 0.05$) changes were detected in terms of L* value in HT_turning (increase of 3.14 units), and in total colour difference in both ripening stages. SSC of turning and pink tomatoes increased 0.65 and 0.13 units, respectively. Only POD activity of HT_pink increased significantly (~30%) compared to initial activity of untreated tomatoes, while PME activity stayed constant. In terms of moulds and yeasts a decrease of 1 log₁₀ CFU.g⁻¹ and a total elimination, respectively, were noted in HT_turning and HT_pink.

During storage, colour changes and tissue softening seems to be retarded in response to HT. pH did not vary, while SSC presented an increase and POD activity revealed a decrease tendency. Before 14 days at 7°C, untreated tomatoes had the highest level of moulds and yeasts compared with HT samples, indicating a delaying on microbial development.

In conclusion HT (42°C/30min) seems to be more effective on quality maintenance and decrease of fungal development compared with untreated tomatoes, during cold storage of whole fresh tomatoes.

References:

- 1 – Ali, Md.S., Nakano, K. & Maezawa, S. (2004). Combined effect of heat treatment and modified atmosphere packaging on the color development of cherry tomato. Research note. *Postharvest Biology and Technology*, 34 (1): 113-116.
- 2 – Fallik, E. (2004). Review - Prestorage hot water treatments (immersion, rinsing and brushing). *Postharvest Biology and Technology*, 32(1): 125-134.
- 3 – Polenta, G., Lucangeli, C., Budde, C., González, C.B. & Murray, R. (2006). Heat and anaerobic treatments affected physiological and biochemical parameters in tomato fruits. *LWT-Food Science and Technologies*, 39 (1): 27-34.

Keywords: Heat treatment, Tomatoes, Quality, Storage