Jorge A Saraiva et al., J Food Process Technol 2015, 6:8
http://dx.doi.org/10.4172/2157-7110.S1.023

OMICS International
conferenceseries.com

4th International Conference and Exhibition on
Food Processing & Technology
August 10-12, 2015 London, UK

The first study comparing the shelf-life of a highly perishable food preserved by hyperbaric storage at room temperature and refrigeration

Jorge A Saraiva, Carlos Pinto, Sílvia A Moreira, Liliana G Fidalgo, Mauro D Santos, Rui P Queirós and **Ivonne Delgadillo**
University of Aveiro, Portugal

Recently, a new food preservation methodology, called Hyperbaric Storage (HS) at naturally variable/uncontrolled Room Temperature (RT), with advantages comparatively to refrigeration, one of them being the absence of temperature control and so, basically energetically costless, is raising great interest among researchers. In this method, foods are stored under moderated pressure (up to 100-200 MPa) with no temperature control, with microbial growth inhibition being verified up to around 75-100 MPa at levels similar to refrigeration. For 100-200 MPa, additional microbial inactivation was observed. Since HS is a very recently proposed novel food preservation methodology, there is a whole new set of conditions and parameters to be studied, like different combinations of pressure and temperature, the effect on pathogenic micro-organisms, and determination of shelf lives. In the present work, preservation by HS of a highly perishable food, water-melon juice (low acidity and high water activity), was carried out under two pressures (75 and 100 MPa) at RT (≈20°C) over 4, 7 and 10 days to determine the shelf life and compare it with that of refrigeration preservation. Microbiological effects on endogenous micro-organisms, and physicochemical parameters were evaluated. In all cases, two control samples were stored at atmospheric pressure (0.1 MPa-AP), one at RT and the other at 4 °C (RF). The results revealed that after 4 days at AP/RT, total aerobic mesophiles (TAM)/ psychrophiles/Enterobacteriaceae/yeast & moulds (YM) were already above 6 log CFU/mL, similar to samples stored at AP/RF for 7 days. On the other hand, in juice stored at 75 MPa microbial loads decreased, showing a reduction of ≈1.7/≈2.0/≈2.5/≈1.7 log units, respectively, while at 100 MPa, a similar behaviour was observed, except for TAM and YM, which were reduced more pronouncedly, with reductions of ≈2.1 and ≈2.2 log units, respectively. This indicates an extended microbiological shelf-life for the juice preserved by HS compared to refrigeration. Regarding physicochemical analyses, HS at 75 MPa resulted in non-considerable effects in the parameters studied, except for browning degree which increased. At 100 MPa, colour was considerably affected, being verified by an increase of the differences compared to initial raw juice, which may be related to the lycopene content decrease observed in these samples. The results of this study show the potential of HS at RT as a new preservation methodology not only to preserve foods as a quasi-energetically costless alternative to RF, but also to extend food's shelf-life, compared to refrigeration.

Biography

Jorge A Saraiva received his BS in 1989 in Biochemistry from University of Coimbra, Portugal. In 1990, he succeed in the first year of the MC in Food Science and Engineering at College of Biotechnology (ESB), Portuguese Catholic University (UCP), Porto, Portugal, having progressed directly to his PhD, in Biotechnology (Food Science and Engineering), also at ESB/UCP. He was invited as an Assistant Professor at Institute of Superior de Ciências da Nutrição e da Alimentação (University of Porto, Portugal), before joining Aveiro University as Assistant Researcher in 1998. His research is mainly dedicated to the use of high pressure for food preservation and processing and for biotechnological applications. He teaches Food Technology, Biocatalysts, Structure and Function of Macromolecules, and Food Biochemistry. He is the Coordinators of the Multidisciplinary High Pressure Platform of Aveiro University and one of the 2 Vice-Coordinators of the Agro-Food Platform. He is Director of the BC in Biotechnology and Member Elected of the Non-thermal Processing Division (NPD) of Institute of Food Technologists (IFT). He has published so far over 90 scientific papers.

jorgesaraiva@ua.pt

Notes: