PROCESS OPTIMIZATION AND MINIMAL PROCESSING OF FOODS

CONTRACT CIPA - CT94 - 0195
COPERNICUS PROGRAMME

Influence of Selected Environmental Factors (Water, Light and Oxygen) on Keeping Quality Characteristics of Freeze Dried Strawberries

C. Allegro[1], F.A.R. Oliveira[1]* and M.F. Poças[2]

Freeze dried strawberries are highly prone to the hazardous influence of environmental factors such as moisture, light and oxygen. The evaluation of the influence of these factors on the degradation of quality indexes is essential when designing protective packaging. The main objective of this work was to assess individual and interactive effects of the above mentioned environmental factors on the quality of freeze dried strawberries. The indexes selected to monitor the product quality were firmness (puncture testing) and visual appearance (image analysis). These two attributes were selected because they are very important from a consumer point of view, easily measured and its determination does not require large amounts of sample. Three sets of experiments were conducted concerning different factorial design combinations of the environmental factors tested: in the first set of experiments the influence of two levels of equilibrium relative humidity and the presence or absence of light on strawberry visual appearance was assessed; in the second set of experiments, the influence of equilibrium relative humidity (0.11 and 0.33%), light (presence/absence), oxygen level (0 and 21%) and storage time (4 and 8 weeks) on texture and visual appearance was assessed; the third set of experiments was conducted in the absence of light and the influence of equilibrium relative humidity (0.11, 0.22, 0.33, 0.43%), oxygen level (0 and 21%) and storage time (4, 6, 9 and 14 days) on texture and visual appearance was evaluated. All experiments were conducted at a constant temperature of 25°C. Results showed that degradation of both quality characteristics was mostly dependent on moisture content. Synergetic effects between moisture content and exposure to light were observed with detrimental effects on the visual appearance of strawberries. The level of oxygen and storage time did not appear to have significant effects. It was thus concluded that the packaging material to be used to accommodate this kind of product should have a high barrier to water vapour transfer and protect the product from light. Flushing with an inert gas and particular care in terms of oxygen barrier do not seem to be required. Validation of these results, through monitoring quality indexes during long term storage, is being carried out.

P1.8/P
Drying

*Corresponding Author
[1]Escola Superior de Biotecnologia - Universidade Católica Portuguesa - Porto - Portugal
[2]Escola Superior de Biotecnologia - Univ. Católica Portuguesa - Food Packaging Center - Porto - Portugal