ASSESSMENT OF MINIMALLY PROCESSED APPLES WITH THE APPLICATION OF EDIBLE FILMS THROUGH BIOSPECKLE

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Abstract

The search for food practicality has been increasing among consumers. Thus, minimally processed food, i.e. fresh products previously cut, washed, sanitised, and packed, gains market adding value to rural producers. Many of those products may be coated with edible films in order to keep their quality through the reduction of the deterioration processes. This study aims to assess the quality of fresh, cut apples, coated and not with edible films through traditional techniques and through the Biospeckle, whose main principle consists of the lighting of a biological material for the acquisition of images to be processed; from those images, it is possible to obtain information on the activity of the analysed material and use them for the conclusions. The acquired images are interference patterns generated through the interaction between the light and the biological material. Traditional methods will be correlated in order to verify the quality of the apples.

Key words: *Biospeckle, respiratory rate, conservation.*

Introduction

Nowadays there is a high consumer demand for fresh products, such as, for example, the minimally processed (MP) ones. During the processing, the MP products suffer several mechanical injuries, which affect the tissues, making them present a more accentuated physiological deterioration, reducing, thus, their conservation time (ALVES *et al.*, 2013).

A way to conserve the MP products is through the use of an edible coating. The objective of the coating is to reduce the migration of water, oxygen, carbonic gas, and aromas, since it works as semipermeable barriers. (KROCHTA; MULDER-JOHNSTON, 1997).

This paper aimed to assess the quality of minimally processed Gala apples submitted to the application of two edible coatings, sodium alginate and pectin, through traditional methods in comparison with the Biospeckle through the calculation of the moment of inertia.

Results and Discussion

The MP apples coated with alginate presented lower values of moment of inertia, darkening index, °Brix, and acidity. The lower moment of inertia indicates a lower biological activity of the tissue, which is confirmed by the respiratory rate, which presented lower values for the samples with sodium alginate on all of the storage days. The samples with a pectin coating presented values of moment of inertia lower than the control samples, but the respiratory rate remained slightly higher than the control samples on the 1st, 2nd, 3rd, 6th, and 7th days; on the 4th and 5th days of storage, the pectin respiratory rate was the same as the control samples¹.

Figure 1 presents the visual aspect of the samples on the seventh day of storage, which was performed at 10°C. Visually, it is possible to observe that the sample with alginate was the one which suffered the least with the oxidation, presenting a lighter colour.

Figure 1. Control sample (1), sample coated with pectin (2), and sample coated with sodium alginate (3); on the seventh day of storage.

Conclusions

Therefore, it is possible to conclude that the edible coatings are an alternative for the increase of the conservation of MP products and that the Biospeckle technique may be used to determine the intensity of the biological activity of the vegetable tissue for the assessment of the quality of biological products.

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¹ KROCHTA, J. M.; MULDER-JOHNSTON, C. Edible and biodegradable polymer films: challenges and opportunities. **Food Technology**, v. 51, n. 2, p. 61-74, 1997.

² ALVES, J. A.; BRAGA, R. A.; VILAS BOAS, E. V. DE B. Identification of respiration rate and water activity change in fresh-cut carrots using Biospeckle laser and frequency approach. **Postharvest Biology and Technology**, v. 86, p. 381-386, dez. 2013.