

**Title** Application of edible coating based on whey protein and *Zataria multiflora* extract for pear (*Pyrus* var. Shahmiveh)

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**Citation** Abstracts of 7<sup>th</sup> International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.

**Keywords** pear; edible coating

### Abstract

The goal of coating development was to improve quality and increase durability of product. Application of edible coatings is a suitable method for fresh vegetables and fruits to maintain their quality and reduce wastage. In this study, durability of pear during 21 days of storage was investigated by using a coating based of whey protein (2.5-5%), *Zataria Multiflora* extract (0-500  $\mu$  lit) and glycerol (0.375-2.25 g). This coating was produced by preparing a solution of concentrated whey protein (its protein content 85%) in distilled water and glycerol as plasticizers.

The pear was coated by immersion at 20 °C and after the coating was dried it was put in to a disposable dish without a cap and was maintained at 6 °C and relative humidity of 78-80% for 21 days. A group of fruit was uncoated as control. Some measurements such as weight loss, titratable acidity, texture evaluation, colorimetry, and soluble solids were determined regularly and weekly and organoleptic tests such as taste and general acceptability were conducted at the end of period of storage. The results were investigated in the form of central composite design and were modeled and analysed by response surface method. The results showed that texture hardness change, total soluble solids, weight loss, titratable acidity and the colour of pear coated by high concentration of whey protein, *Zataria Multiflora* extract and glycerol was less than the other pears. Moreover, these pears obtained much more points and were more acceptable. According to variance dissociation tables it was recognized that whey protein is the effective factor in coating proce sand influertce of *Zataria Multiflora* extract and glycerol is than less whey. Expression modulus for acceptable regression models of texture, percent of soluble solid, titratable acidity, percent of weight loss and colour changes at the end of storage period were 0.9016, 0.9066, 0.9225, 0.9067, 0.9317 respectively. Meanwhile non acceptability factor for all the properties above 90% level was not expressive; correctness of the model for acceptability of data was confirmed. According to the results, optimum points of the variables for achieving a coating with maximum effect on durability improvement of pear are: 4.99 g of whey protein, 500  $\mu$  lit of *Zataria Multiflora* extract and 2.24 g of glycerol.