

## **THE ROLE OF PACKAGING AND PRE-PACKAGING TREATMENTS ON ORGANOLEPTIC AND QUALITY ATTRIBUTES OF FRESH-CUT CABBAGE LEAVES DURING COLD STORAGE**

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### **ABSTRACT**

The demand for fresh cut, ready-to-use fruits and vegetables is increasing worldwide, however, fresh cuts have a short shelf life because of their inherent sensitivity. Fresh cut cabbage leaves can be used for making stuffed cabbage rolls (Mahshi) and or eaten raw along with green salads. Different pre-packaging treatments and local packaging materials were used in order to preserve cabbage leaves quality for longer time. The dipping treatments were: ascorbic acid (0.2%), potassium permanganate (0.02%), and water (control). After dipping, drained samples were then packaged in two polypropylene (PP) pouches (12 × 20 cm) of different thickness (22, and 30  $\mu$ ) and in polystyrene (PS) trays over-wrapped with a clear stretch PVdC film. Packaged cabbage leaves were kept refrigerated at 4 $\pm$ 0.5 °C and 85 $\pm$ 3 % R.H.

Water loss of packaged cabbage leaves, was minimal for samples packaged in PP-22 and PP-30 pouches, whereas those packaged in PS trays showed the greatest weight loss. The water treated samples showed the least shelf life. Other treated samples showed lower microbial counts initially and continued lower during storage. Samples treated with ascorbic acid were the best followed by those treated with potassium permanganate. Deterioration in color (browning edges) was fast notable for the water dipped samples, whereas ascorbic acid treated samples had higher panelists' scores for color during storage. Packaged cabbage leaves showed about 9 days shelf life. PP materials available at the local market are not recommended for packaging fresh cut unless perforated to allow for the respiration of fresh cut vegetables and to avoid anaerobic bacterial growth and anaerobic respiration development. PS-tray covered with stretch PVdC over wrap was the most appropriate package.

### **INTRODUCTION**

Consumption of fresh cut, ready-to-use fruits and vegetables is increasing worldwide. This is related to increasing health awareness, changes in life style, and seeking convenience in meal preparation and consumption. Fresh cuts have short shelf life because of their inherent sensitivity for quick deterioration and they require special care and protection. The demand for minimally processed vegetables has promoted an increase in the quality and variety of the products. Temperatures between 0°C and 3°C can extend the shelf life of minimally processed vegetables from 5 to 18 days, since the quality degradation is retarded by the lower temperature causing a reduction in the respiratory rate Scoot (1989).

Minimally processed, "fresh-cut" fruits or vegetables are defined as those that maintain their fresh state regardless having suffered physical alterations. They go through a sorting process, washing, peeling and cutting in order to produce a packaged, 100% usable products which offer to the