

Producing highly nutritional freshcut salads with long shelf life.
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R&D

Abstract

Traditional open field agriculture is facing declining margins in face of the growing competition for western markets. To assure profitability it is necessary to develop technologies for added-value products prepared from locally grown produce. Fresh-cut vegetables and fruits are a relatively new and rapidly developing component of the US and European fresh produce industry. The research aims to develop a novel integrated processing and preservation system in which fresh-cut vegetables and fruits may be prepared at point of harvest and maintain high quality during transportation, distribution and vending.

The present report summarizes the results of our study on tomato and pepper. The work included steps of variety selection, establishment of cultivation protocol and development of processing procedures. The results indicate that with the right set of choices it is possible to produce high quality fresh-cut tomato and pepper with 14-day shelf-life in refrigeration.

Background and research description

Traditional open field agriculture is facing declining margins in face of the growing competition for western markets. To assure profitability it is necessary to develop technologies for added-value products prepared from locally grown produce. This will enable farmers to grow various crops during most of the year and market them as ready-to-consume products.

Fresh-cut vegetables and fruits are a relatively new and rapidly developing component of the US and European fresh produce industry. The added-value products satisfy the increasing demand of consumers for healthy and natural ready-to-use foods.

The research aims to develop a novel integrated processing and preservation system in which fresh-cut vegetables and fruits may be prepared at point of harvest and maintain high quality during transportation, distribution and vending. Based on our preliminary tests, local produce quality and low initial microorganism load make the Southern Arava an ideal location for such a venture.

Endorsed by the specified interest of a leading Israeli food industry, the project investigates the feasibility of producing a fresh-cut "Israeli salad", from locally grown tomato, cucumber, pepper and onion.

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Experimental design

Firm fruit at the final color stage were harvested, cooled, sanitized and sliced. The slices were placed in sterile containers and stored at 2-4°C. Product quality was assessed by both organoleptic (appearance, mouth-feel, flavor) and objective

(firmness, acidity, BRIX, bacteriology) aspects. In addition, the content and activity of antioxidants was determined.

Results and discussion

Tomato

The study was carried out on tomato varieties that are routinely grown in the Arava region: medium-size ("Nesicha", "Ikram") and "Cherry" (643, 646, 8006). Medium-size fruits were better suited for the fresh cut product yielding 14-day shelf life in the refrigerator. Of the two varieties, the quality of fresh-cut "Ikram" tomato scored higher (Fig. 1). The content of lycopene (an important antioxidant carotenoid) and the antioxidative capacity were also preserved during product storage (Fig. 2).

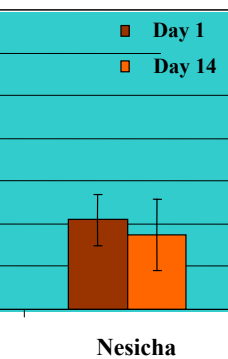


Fig. 1: Quality and shelf-life of fresh-cut tomato – comparison between varieties.

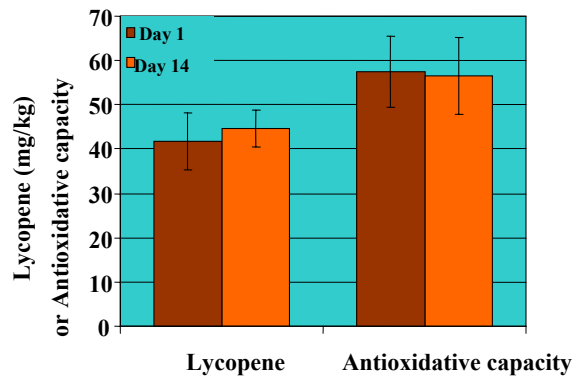


Fig. 2: Antioxidant content and activity of fresh-cut tomato – stability during storage.

Pepper

Three varieties of locally grown sweet red pepper were studied: "Selica", "Kobi" and "107". Fruits of Var. "107" deteriorated very fast after cutting. Comparison between the two other varieties (Fig. 3) pointed at "Selica" as the favorable crop for fresh cut product.

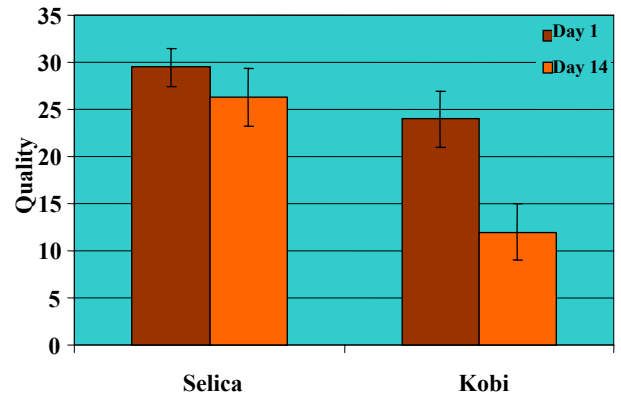


Fig. 3: Quality and shelf-life of fresh-cut pepper – comparison between varieties.

Taken together, the results indicate that it is possible to prepare from locally grown vegetables chilled fresh-cut products that preserve their quality as well as nutritional value during the period required for transportation, distribution and retailing.