

## Physiological Changes of Fruit and Vegetable Carving

Jomkwan Suwannarak<sup>1</sup>, Putkrong Phanumong<sup>2</sup>, Nithiya Rattanapanone<sup>2,3\*</sup>

<sup>1</sup>*Faculty of Home Economics Technology, Rajamangala University of Technology Phra-Nakhon, Bangkok 10300, Thailand*

<sup>2</sup>*Faculty of Agro-Industry, Chiang Mai University, Chiang Mai 50100, Thailand*

<sup>3</sup>*Postharvest Technology Research Institute, Chiang Mai University, Chiang Mai 50200, Thailand*

\*Corresponding author. E-mail: agfsi001@gmail.com

### ABSTRACT

*This study investigated the physiological responses of carving fruits and vegetables on respiration rate, ethylene production and electrolyte leakage. Pumpkin, carrot, radish and cantaloupe were carved into the shape of rose or carnation flowers, while Japanese cucumber was carved into lotus flower. All five plants were also carved into leaf shapes. The physiological changes were investigated during each stage of the carving process. The results showed that respiration and ethylene production rates were affected by carving, increased significantly during carving steps for all styles and shapes. Carving into leaf shapes induced higher respiration and ethylene production rates than carving into flower shapes. Carving pumpkin into a rose flower shape caused higher respiration and ethylene production rates than a carnation flower due to differences in intensity of the wound stress. High electrolyte leakage occurred in all samples, regardless of plant or shape. The physiological changes identified here affected both quality and shelf life of carved plant.*

**Keywords:** Carving, Physiological changes, Pumpkin, Carrot, Radish, Cantaloupe, Japanese cucumber

### INTRODUCTION

Vegetable and fruit carving is a traditional Thai art that originated in the Royal Thai courts, although no official recorded evidence on the origin exists. When Sukhothai province was the capital of Thailand (A.D. 1238-1438) during the reign of King Phra Ruang, one of his female retainers, Miss Nopamas, wrote a book entitled, *Tao Sri Chulalak* or *Nang Nopamas*, which mentioned various traditional rites. One of the rites involved floating bowls that were elaborately decorated with beautifully carved flowers and plant materials of many kinds. This is considered the official commencement of the art of vegetable and fruit carving in Thailand (Fine Arts Department, 1971).

Today, fruit and vegetable carving has become popular across the globe – found in a variety of restaurants, hotels, catering halls, exhibitions and cruise