

Thesis Title	Effect of UV-C Irradiation Before and After Partial Vacuum Packing on Shelf Life of Fresh-cut ‘Phulae’ Pineapple
Author	Thet Hsu Hsu Aung
Degree	Master of Science (Postharvest Technology and Innovation)
Advisor	Assistant Professor Phunsiri Suthiluk, Ph. D.
Co-Advisor	Assistant Professor Sutthiwal Setha, Ph. D.

ABSTRACT

Fresh-cut ‘Phulae’ pineapple is popular for local consumption and export markets. However, the short shelf life due to the initial microbial contamination is the main problem with this product. Thus, the study aimed to compare the effects of UV-C irradiation before and after partial vacuum packaging on the quality changes of fresh-cut ‘Phulae’ pineapple. Two doses of UV-C radiation, including 800 and 1200 J/m² were applied to fresh-cut ‘Phulae’ pineapple before or after packed with 80 % of the vacuum package. The treated samples were then kept under 5±1°C. From the result, UV-C radiation significantly slows down the loss of firmness, reduces juice leakage and decreases microbial populations, including bacteria, yeast, and mold. Among UV-C treatments before and after vacuum packaging, the result showed that direct exposure to UV-C at 800 and 1200 J/m² before packaging proved more effective than UV-C treatment applied after packaging, especially in the microbial population.

Therefore, the dose of 1200 J/m² irradiated before packaging was chosen for simulating transportation due to its lowest total plate count of 4.01 log CFU/g. The transport condition was simulated according to the local fresh-cut company in Chiang Rai. The samples were kept at 0–4 °C for 24 hours, then loaded by pack in the foam box with ice and stored in the room for 12 hours. After that, samples were transferred to 10–15 °C, imitating the shelf temperature. The results showed that after 10 days of storage, the sample without UV-C irradiation (control) contained escalated internal gas and provided fermented odors. In addition, the TPC of the control was 2 log CFU/g higher than that of the irradiated sample. However, the treated sample was found sound in the vacuum packing condition, and TPC was 4.74 log CFU/g at 2 weeks of storage.

Irradiating with UV-C at 1200 J/m² before vacuum packaging offered a trustworthy alternative for maintaining the sensory qualities of fresh-cut 'Phulae' pineapple during transportation.

Keywords: Fresh-cut, Shelf Life, UV-C, Partial Vacuum Packing, Microbial