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| <b>Thesis Title</b> | Quality Improvement of 'Phulae' Pineapple Puree by High Pressure Processing |
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## ABSTRACT

'Phulae' pineapple (*Ananas comosus* L. Merr) is a popular commodity and a Geographical Indication of Chiang Rai province, Thailand which is cultivated all year and typically consumed fresh. The oversupply and mismanaged postharvest of the crops leading to the lower price of the product. The aim of the study was to study the effect of high-pressure processing (HPP) on the quality improvement of 'Phulae' pineapple puree to be a value added for the product. The study was divided to 4 parts. Part I: preliminary study to select the suitable condition for the HPP, Part II: to study the effect of HPP during storage, Part III: to study the effect of HPP on Glycemic Index (GI) and dietary fiber, and Part IV: to study the effect of HPP on the anti-inflammatory activity.

For the preliminary, 'Phulae' pineapple puree was prepared fresh and treated with HPP (400 and 600 MPa for 5, 10, and 15 mins) as well as heat treatment (HT) (80°C for 10 mins). The preliminary study shows that HPP could retain all of the quality attributes of 'Phulae' pineapple puree, producing higher antioxidant activity and bioactive compound in the product, with the same amount of microbial reduction as heat treated sample. HPP at 400 and 600 MPa for 10 mins were used for the further experiment alongside the fresh and HT sample, due to its high amount of antioxidant capacity and bioactive compound.

During storage, the physiochemical attributes such as pH, TSS, and TA were stable but the color are slightly change. Despite the similar microbial safety during the storage with the HT sample, all the bioactive compounds and antioxidant activity of the samples were decreasing overtime during the storage.

The study also found that GI of all samples is between 40.36 to 44.47, with HPP product showed the higher GI, due to the change of the sucrose to glucose during the treatment. However, the number for all samples are <55 which still considered as low GI food. The study also found out that HPP product have higher anti-inflammatory effect compared to fresh product. However, the amount reduced during storage. HPP treated sample at 400 MPa for 10 mins is the most optimal treatment for 'Phulae' pineapple puree due to its lower energy consumption (lower pressure) but similar result with the HPP treatment at 600 MPa for 10 mins.

**Keywords:** High Pressure Processing, 'Phulae' Pineapple Puree, Quality Attributes, Functional Properties