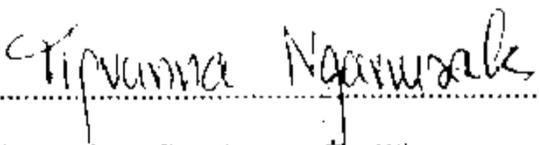


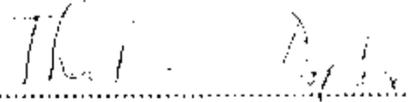
THESIS TITLE : A STUDY ON THE CONDITIONS AFFECTING
OSMOTIC DEHYDRATION OF KAEW MANGO
(*Mangifera indica*) FOR DRYING

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ABSTRACT

Mango is one of the important economical fruit of Thailand. The plantation area is one of the largest amongst Thai fruits growing. Mango has a high production potential and has been promoted to increase the income of the farmers and process for export. In consequence, dried mango is much in demand because of its versatility in utilization, especially for overseas market. In most drying processes, osmotic dehydration is often used because of its ability to reduce time and heat of drying, resulting the decrease of the deterioration due to over heating. In addition, the solute in osmotic solution can be diffused into mango flesh to give a better color and texture product. The aim of this study was to investigate the effects of the ratio between quantity of mango slice and osmotic solution and the number of soaking step in the osmotic solution on the water reduction and on the chemical, physical characteristics and on consumer acceptance of the dried mango products.

The study on the conditions effecting osmotic dehydration of Kaew mango (*Mangifera indica*) for drying were carried out for two selected parameters, which were the ratio between quantity of mango slice and osmotic solution and the number of soaking step in the osmotic solution. The ratio between quantity of mango slice and osmotic solution were three levels: low level (1:2), middle level (1:3) and high level (1:4). The number of soaking step in the osmotic solution were three

levels: low level (one soaking step in 60 °Brix), middle level (two soaking steps in 50 and 60 °Brix) and high level (three soaking steps in 40, 50 and 60 °Brix). Three replicates of 3 X 3 factorial experiment were used in this study which made up of total 27 treatment combinations. The preliminary experiment was carried out to determine the time needed for the osmotic dehydration to reach an equilibrium. The equilibrium times were then used for the study on the effects of both parameters on the osmotic dehydration for these 27 treatment combinations. The osmotic dehydrated products from these treatment combinations were then dried. Samples were analyzed for the chemical and physical characteristics and test for the consumer acceptance of the products. Regression analysis was used to find a relationship between the consumer acceptance and chemical and physical characteristics.

It was found that the effect of these two parameters on the water reduction were significantly difference ($p < 0.05$). Water reduction increased with the increase of the level of both parameters.

The studies on chemical and physical characteristics of dried products showed that the effects of these two parameters on the total acid content, redness and yellowness value of products were insignificantly difference ($p > 0.05$). However, the effects of these two parameters on the total sugar content, the sugar acid ratio, the hardness of the product texture and the lightness of color value of the product were significantly difference ($p < 0.05$). The total sugar content and the sugar acid ratio increased with the increase of the level of both parameters. The hardness of the product texture decreased with the increase of the level of both parameters. The lightness of color value of the products increased with the increase from low level to middle level of the two parameters only and then decrease from middle level to high level.

The study on consumer acceptance of dried mango using 9 point hedonic score showed that there were insignificantly difference ($p > 0.05$) among the products. All products were rated from moderately like to very much like.

The determination coefficient value (R^2) of the relationship between color liking score, flavor liking score, texture liking score and overall liking score was 0.544 ($R^2 = 0.544$). There was linear relationship between color liking score, flavor liking score, texture liking score and overall liking score. From the

relationship indicated that flavor liking score was more important to overall liking score than color liking score and texture liking score.

The results from the analysis of the relationship between liking score and chemical and physical characteristics indicated that there were no relationship between color liking score and the color value of the products, flavor liking score and sugar content of the products and texture liking score and the hardness of product texture. There were also no relationship between the redness and yellowness value of the products and the sugar content of the products. There was linear relationship between the hardness of product texture and sugar content of the products which the determination coefficient value 0.951 ($R^2 = 0.951$). The hardness of product texture decreased with an increase in sugar content. There was no linear relationship between the lightness of color value of products sugar content of products, the determination coefficient value was 0.844 ($R^2 = 0.884$).

From this study, it can be concluded that the rate of water reduction from the mango slices soaked in the osmotic solution will be increased with the increase of the quantity of osmotic solution and the number of soaking steps.