CHAPTER 1

Introduction

1.1 Principles and rationale

Longan fruit (*Dimocarpus* longan *Lour*.), which is called 'Lumyai' in Thailand, belongs to the *Sapindaceae* family (Nuchanart *et al.*, 2007). Longan fruit is a well – known subtropical fruit that is grown commercially and consumed widely in many countries such as China, Thailand, Vietnam, India, Australia and some tropical and subtropical regions in the USA (Yifen *et al.*, 2016). Longan is one of exported fruits of Thailand (Krit *et al.*, 2015). However, a big problem challenging the longan grower is the overwhelming quantity of fresh products in season because of their short and limited shelf – life (Yifen *et al.*, 2016). Moreover, the consumers' demand for fresh – like and easy to prepare products always increase which conjoins with consumer lifestyle changes. Therefore, a wide variety of minimally processed fruits and vegetables have been developed (Ramos, 2013). In addition, dried longan products which were dried by hot air oven required long processing time and high energy consumption (Krit *et al.*, 2015). The intermediate moisture longan using combination of osmotic dehydration and hot air drying can be one of an attractive solution to reduce the drying time, energy consumption and to obtain the soften texture of dried longan. Harder texture of dried longan was found drying by hot air dryer as compared to other processes such as combination of hot air dryer and far – infrared radiation (Nathakaranakule *et al.*, 2010).

The osmotic dehydration can reduce the moisture content and water activity in the range of 0.6 – 0.84 of fruits and vegetables in which water is partially removed from the product by immersing in the aqueous solution combining from one or more solutes (Keila *et al.*, 2014 and Gustavo *et al.*, 2007). The addition of citric acid in osmotic solution has

been used to inhibit enzymatic browning of longan fruit (Chavan and Amarowiez, 2012). This process can be obtained as minimally processed food with a longer shelf – life and improved nutritional value (Keila *et al.*, 2014) due to the impregnation of minerals and vitamins into its porous structure (Fito *et al.*, 2001). However, this process is not enough for inhibiting bacterial, yeast and mold growth, the osmo – dehydrated products should be processed further by drying, which has been employed during or after osmotic treatment to enhance osmotic dehydration performance by increasing the cell membrane permeability and mass transfer rate (Ahmed *et al.*, 2016), is a popular preservation method for food commodities. The combination of these hurdles can reduce the process time and energy consumption (Sudhanshu *et al.*, 2009 and Aree *et al.*, 2001) as well as improving the qualities of fruits and vegetables during storage (Ahmed *et al.*, 2016).

1.2 Objectives of the study

The objectives of the present study can be summarized as follow:

1.2.1 To formulate the optimum osmotic solution for drying intermediate moisture longan.

1.2.2 To compare the effects of hot air drying and vacuum oven drying on the quality of intermediate moisture longan.

1.2.3 To determine the qualities of dried longan product using fresh longan compare to frozen longan.

1.2.4 To evaluate the shelf – life of intermediate moisture longan.

1.3 Education and application advantages

The output of the study can be categorized as follows:

1.3.1 The knowledge of the suitable hurdle technique for improving quality of dried fruits on drying processing will be obtained. The final results can be applied as prototype of other fruit foods in the future.

1.3.2 The results from this research can solve the overwhelming quantity of longan and has a potential to export them to other countries for long shipping time.