EFFECT OF DRYING ON PHYSICOCHEMICAL PROPERTIES AND ANTIOXIDANT ACTIVITIES OF BILIMBI (*Averrhoa bilimbi* L.) SLICES

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ABSTRACT

THE EFFECTS OF DRYING ON PHYSICOCHEMICAL PROPERTIES AND ANTIOXIDANT ACTIVITIES OF BILIMBI (*Averrhoa bilimbi* L.) SLICES

In this study, drying rate of bilimbi slices is investigated using syrup blanching as pre-treatment method under three different temperatures. Experiments were conducted using convection oven at temperature from 40, 50 to 60 °C. The value of the moisture was recorded at one hour interval until achieving 20% moisture content. The effect of drying temperature on the water activity, moisture content, colour, texture, total ash, vitamin C and antioxidant properties of the bilimbi slices were also determined. The result showed that the treatment of bilimbi slices with syrup increase the rate of drying as compared to those untreated slices. As the temperature increase, significant ($p<0.05$) decrease in drying period was obtained. The application of syrup treatment to the slices gave low water activity value (0.61±0.00) and also reduced moisture content percentage (20.13±0.03), vitamin C content percentage (4.43±0.03) and shrinkage percentage (89.30±0.06). However, in contrast, it helps retained the bilimbi slices colour (45.72 for L* value, -1.09 for a* value and 24.15 for b* value) and also the total percentage of ash content (65.42±0.88), and contribute to the firmness of the bilimbi slices' texture (10.26 ± 0.81). Decreasing in total phenolic content of dried bilimbi slices was reported as the drying temperature increase. The antioxidant activity of the bilimbi slices after syrup blanched was significantly lowers (56.27±0.11) percent as compared with the control at 40 ^{o}C.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Bilimbi (*Averrhoa bilimbi* Linn) fruit is one of the nutritious native fruits available in Malaysia abundantly. Bilimbi tree is originally grown in Moluccasin, Indonesia, known as “belimbing asam” or “belimbing wuluh”. Not only in Malaysia, this tree is also cultivated in Argentina, Brazil, India, Sri Lanka, Phillipine and many other countries around the world (Chowdhury *et al*., 2012). Well known as small size nourishing and attractive fruit, bilimbi has been a great medicated plant, obtained from its leaves and the fruit itself.

Generally, due to the pleasant taste, useful and plenty of nutritious properties of the fruit, bilimbi fruit have been cultivated in the suburban areas for their own private used. In some areas, people are not really noticed on the nutritional function of this healthy fruit. The fruits often left untouched and let to be fall on the ground when ripen. According to Galvao *et al*. (2001), the matured of 10 years old bilimbi tree usually can produce almost 100 pounds of fruits in one time. Since the fruits have a very thin and soft-skinned texture, the fruits have a very short shelf life upon harvesting.

Upon the season of harvesting period, this large amount of fruits may undergo the post-harvesting losses as the fruits cannot stay for a long period of time after harvesting. As the fruits are very small and easy to damage, immediate handling is required. Poor post-harvest handling may leads to