

CHAPTER 1

INTRODUCTION

1.1 Problem Background

Purple sweet potato (*Ipomoea batatas*) is one of the tubers, which grow in Indonesia. This tuber is one of the varieties of sweet potato (*Ipomoea batatas*) containing carbohydrate, vitamins and anthocyanin as colorant (Iswari & Budiastara, 2013). According to Putra (2013), Indonesian have consume purple sweet potato since the last decade. Furthermore, large companies and home-based entrepreneurs have been producing foods with purple sweet potato as the main ingredient, often found as processed foods, such as snacks, jam, beverages, and cakes (Putra, 2013). Therefore, it is interesting to study the process of making food product based on purple sweet potato.

One of the most popular products derived from purple sweet potato is known as purple sweet potato chips. Snack in the form of chips are typically the most preferable snack for Indonesian people because they have crispy texture with the taste of either savory or sweet (Putra, 2013). A method that can preserve the original characteristic of raw material in chips product is required.

Vacuum frying method allows food product to have low oil content compared to regular frying due to the utilization of low atmospheric pressure level. This allows the preservation of food original color resulted in more attractive product (Moreira, 2014). Under vacuum condition, the oil temperature can be as low as 90-100°C if compared with the regular frying (160-190°C). Other than that, this method reduces acrylamide reaction, which appears when amino acid such as asparagine is exposed to high temperature (Belkova et al., 2018). Acrylamide induced browning in the product. It is also known that the compound is carcinogenic.

This type of frying method also reduces oil absorption while maintaining the color, nutritional value and retains the organoleptic properties of the food. De-oiling step is the part of vacuum frying process to reduce the oil content in the food, by inserting the food into in high-speed centrifuge. Less than 60% of oil absorption decreases during this steps in sweet potato chips using centrifuge at 40 seconds for 750 rpm (Moreira, 2014).

To further increase the quality of chips product, pretreatment can be done before vacuum frying process. Blanching method was shown to improve the color and texture of potato chips product (Califano & Calvelo, 1988). Oyedeji et al., (2017) has demonstrated the use of blanching and pre-drying for cassava chips product. Furthermore, freezing pretreatment has been proven to increase the crispiness in deep-fried sweet potato (Baba & Yamamura, 1981).

Based on previous studies, pretreatment process gives significant result on improving the crispiness and color of chips product. Currently, there is no study combining both blanching and freezing pretreatment for vacuum fried purple sweet potato chips product. Therefore, the purpose of this research is to see on whether vacuum fried purple sweet potato chips product would have increased quality in terms of crispiness and color.

1.2 Problem Formulation

The focus of this research is to analyze the effect of blanching and freezing pretreatment, which can affect the color and crispiness of purple sweet potato chips product. According to Putra (2013), blanching before deep fat frying purple sweet potato gives significant effect to the crispiness and maintains the purple color of chips. On the other hand, according to Sucipto (2015), the freezing treatment also gives significant effects on the crispiness of vacuum fried mango chips.

In this research, blanching and freezing will be used as the pretreatment for vacuum fried purple sweet potato. The pretreatment resulted in significant improvements on the previous studies. However, both pretreatments have not been studied simultaneously for purple sweet potato product. Thus, the problem formulation of this research is constructed to answer the following questions, which are:

- Is there any effect of the blanching pretreatment on crispness and color change of purple sweet potato chips fried using vacuum frying?
- Is there any effect of the freezing pretreatment to crispness and color change of purple sweet potato chips fried using vacuum frying?

- Is there any effect the combination of blanching and freezing pretreatment interactively on crispness and color change of purple sweet potato chips fried using vacuum frying?

1.3 Research Objectives

The objectives of this research are elaborated into several points, which include:

- To investigate the effect of blanching pre-treatment on color and crispiness of purple sweet potato chips.
- To investigate the effect of freezing pre-treatment on color and crispiness of purple sweet potato chips.
- To investigate the effects the combination of blanching and freezing pre-treatment simultaneously on color and crispiness of purple sweet potato chips.

1.4 Hypothesis

Based on the problem formulation, the hypothesis in this study are elaborated as follow:

- H0: Blanching and freezing not simultaneously affect the quality by improving crispiness and the color of vacuum fried purple sweet potato chips
- H1: Blanching and Freezing simultaneously affect the quality by improving crispiness and the color of vacuum fried purple sweet potato chips

1.5 Importance of The Research

This research will benefit various beneficiaries including:

- The importance of this research is to provide insight and analysis regarding the crispiness, color analysis, fat, water activity and moisture content of vacuum fried purple sweet potato chips pretreated with blanching and freezing pretreatment.
- This study can be used to improve the quality of vacuum fried purple sweet potato chips.