

CHAPTER 2

INTRODUCTION

2.1 Background of the Study

“Coffee is proof that mornings were created for a reason”, this is a quote from a coffee addict. According to "Global coffee consumption will increase by a third to 200 million bags"(2016), this year which is 2016, the production of coffee is about 140 million bags and it is estimated to increase by a third to 200 million bags by 2030. Today, coffee is enjoyed and consumed by people from all over the world. There are lots of sayings towards coffee consumption. Some say coffee can bring a lot of benefits. There is no doubt that coffee can bring us advantages. One of the reason is that coffee is antioxidant rich beverage. Yashin et al. (2013) showed that coffee contain 150 to 300 mg/g total antioxidant content which is higher than tea but lower than cocoa. Antioxidant activity is the biggest contributor to the benefits of coffee. Among the components contribute to antioxidant activity in coffee are chlorogenic, ferulic, caffeic, and n-coumaric acids. Even caffeine and trigonelline are considered as antioxidants.

However, Silletta & Marchioli (2008) said that coffee has either beneficial or harmful effect on health due to the presence of trigonelline and caffeine. Furthermore, among so many dietary products which contain caffeine, coffee contains the highest caffeine content in which the average caffeine content of brewed coffee is from 95mg to 200mg per 8 oz of coffee (Mayo Clinic, n.d.). Large amount of coffee consumption especially caffeine component in coffee will result in various chronic diseases such as cardiovascular disease, high blood pressure, high cholesterol level and others. Bonita et al. (2007) proved that caffeine in the coffee can increase the blood pressure and sympathetic nerve activity of non-habitual drinkers. However, for habitual drinkers, due

to mental stress problem caused by caffeine, they went through a lack of blood pressure increase although there is an increase in nerve activity.

The problem faced nowadays is the demand of coffee in this world is increasing. Coffee brings benefit but harms too. In this healthy lifestyle times, people start to seek for the way to consume coffee in the healthiest way. Decaffeinated coffee was produced before, however, study shows that it is not as good as we expected. This is mainly due to the solvent and coffee beans used in the decaffeinated process which will bring us adverse effects (Rafetto et al., n.d.).

Herbal coffee is one of the coffee products which receives well recognition in the current market as nowadays people keen in pursuing healthy lifestyle. The addition of herbs to coffee offers consumers to gain health benefits besides reducing the components which are bad to health. *Nigella sativa* herb plant which belongs to the botanical family *Ranunculaceae* can bring numerous great benefits. One of the benefits brought by *Nigella sativa* seed is anticancer. This is proved by a research of treating the human volunteer with whole seeds powder at doses of 1g twice per day for a duration of 4 weeks. From the results, the ratio of T-Lymphocytes helper T-cell to T-suppressor cell increased by 72% besides enhancing the T killer cell function and number (El-Tahir & Bakeet, 2006).

Thus, this research is done to study the effect of mixing *Nigella sativa* seeds with coffee by considering different parameters such as temperature, ratio of *Nigella sativa* to coffee and mixing time in order to find out the most significant parameter which bring significant effects to the nutritional value of the herbal coffee besides reducing the caffeine content of coffee.

2.2 Motivation

Nowadays, the demands of coffee are getting higher. Coffee lovers like to chill around the coffee shop or indulge their coffee cravings before they start their daily work routine or after a long working day. Coffee is rich in antioxidants, moderate consumption actually brings us many health benefits. However, due to the existence of

caffeine in coffee, an individual will get addicted to coffee uncontrollably. Harmful health effects will be resulted due to high consumption of coffee. According to European Food Safety Authority (2015), a daily consumption of 400mg of caffeine is considered safe for adults. However, for developed teens which are between 13 to 18 years old, consumption of caffeine should not be more than 100mg. As for pregnant woman, consumption of 200mg or less caffeine will cause a little risk to fetus. One cup of brewed coffee (8oz.) can contain 90mg to 200mg of caffeine. As for instant coffee, the caffeine content is in the range of 27mg to 173mg (Mayo Clinic, n.d.). People who are addicted to coffee can consume up to 5.6 cups of coffee per day. The caffeine level consumed definitely exceeds the safe limit of caffeine consumption (Leviton et al., 1994). The presence of decaffeinated coffee actually give a reason for coffee lovers to drink coffee without feeling guilty. However, problem associated with decaffeinated coffee arises too. People start to seek for the best and healthiest way to consume coffee. Herbal coffee is believed to receive more recognitions in the future especially when people are in the direction to pursuit healthy lifestyle. Febrianto & Rizki (2015) did a study on the addition of cardamom to the coffee. The study showed that this herbal coffee is potential to be developed as one of the coffee diversification products. *Nigella sativa*, a kind of herb plant, consists of numerous benefits. The seed itself contains more than 100 nutrients. The adding of *Nigella sativa* powder to coffee under the influence of different parameters is believed to increase the nutritional values of the coffee besides reducing the bad components of the coffee. Therefore, investigating the significant parameters which can produce coffee mixed with *Nigella sativa* powder with low level of caffeine and additional values without affecting the aroma of coffee has become the motivation for this research.

2.3 Problem Statement

Coffee is the most popular drink in this world besides water. People drink coffee for various reasons. A lot of them drink coffee for the sake of keep them awoken during working. Some seek for the best taste from various types of coffee. Compared to alcohol, coffee is always assumed as healthy alternative in any gatherings. For example, in Taiwan, instant coffee is ready available in a lots of places such as petrol station, mini market or convenient store. Similarly in Malaysia. People's demand towards coffee is