

Chapter 1

Introduction

1.1. Project Background

Curry is a dish which originated in India and spread throughout Asia due to its unique flavor (Sen, 2009). As it is being spread to other countries, other countries have integrated their cultures and lifestyles into the formulation itself, causing changes in the fundamental properties of the curry, which then led to the creation of different types of curry. One of them is Japanese curry, which is known to be milder and thicker in consistency compared to the traditional Indian curry. Despite being widely known for its mild flavor compared to other curries such as Thailand or Indian curry, Japanese curry itself also contains a high amount of spices which provides a considerable amount of antioxidant activity (Nakayama et al., 2014).

Even though curry may contain a high amount of spices which contributes to the antioxidant activity of the product, curry itself also contains a moderate amount of fat and oil depending on the type of curry. For example, Japanese curry which are commonly produced using curry blocks or curry roux contains a moderate amount of fat as they are one of the main ingredients of the curry block which is made up of around 30% fat (S&B Foods, n.d.).

The presence of a high amount of fat in food is usually related with quality deterioration and reduction in consumer acceptance due to color, odor and flavor changes. To address this issue, food manufacturers have applied the use of synthetic antioxidants in high-fat containing food to prevent the auto-oxidation in their products, as they are stable, cheap and effective (Xie et al., 2009). But, some health concerns regarding the use of synthetic antioxidants is associated with its long-term consumption do exist. Some of these concerns include potential carcinogenicity, potential cause of liver damage, and the consumption of a high dose of synthetic antioxidant may lead to DNA damage

(Botterweck et al., 2000) (Engin et al., 2011). Therefore, natural antioxidants have gained attention as a potential replacement for their synthetic counterparts (Dickson et al., 2011).

One source of the natural additive that is known for its potent antioxidative activity is green tea extract. Green tea, brewed from the mature leaves of *Camellia sinensis* or otherwise also known as the tea plant, is one of the most popular beverages worldwide. It is also valued for its curative properties which can be experienced alongside the pleasure of drinking it (Karaosmanoglu et al., 2015). The polyphenols responsible for the antioxidative properties of green tea are mainly catechins, in which EGCG is present with the highest concentration among the other catechins. The catechins present in green tea are colorless, water-soluble, and can be considered as one of the main causes of the unique taste and aroma of tea. Catechins are the main contributor to the bitter taste of tea and wine (Friedman, 2007).

Green tea extract was chosen as a natural antioxidant in this experiment due to its high concentration of catechins. Among the catechins present in green tea, primarily EGCG had been studied extensively due to the increasing concerns regarding the use of synthetic food additives in the food industry (Lourenço, 2019). Thus, the importance of this study is to observe the changes in the antioxidant activity of high-fat-containing food (%RSA) and other quality factors of the Japanese curry sample over a period of time.

In this experiment, RTE Japanese Curry was used as the product to test for the antioxidant activity of the samples expressed in terms of radical scavenging activity (%RSA) when added with green tea extract powder. The effects of the addition of the green tea extract powder on the sensorial and physicochemical properties of RTE Japanese curry samples over the course of 7 days were observed in this experiment. The parameters of the physicochemical properties that were analyzed were the antioxidant activity, pH and viscosity of the samples. The sensory tests performed were preference and discriminative sensory analysis.

1.2. Objective

The objectives of this study are to investigate if there are any changes to the physicochemical and sensorial properties of RTE Japanese Curry which were treated with different concentrations of green tea extract powder over the course of seven days. The physicochemical properties that will be assessed include the antioxidant activity (%RSA), pH and viscosity, and the sensorial properties will be observed using discriminative and preference tests.

1.3. Problem Formulation

The problems that will be addressed in this study are as follows:

1. What are the effects of adding green tea extract to the overall antioxidant activity of the product?
2. What are the effects of adding green tea extract to the sensorial properties of the RTE Japanese Curry sample?

1.4. Hypothesis

The null hypothesis (H₀) of this experiment is that the addition of green tea extract does not have any significant effect on the physicochemical or sensorial properties of the samples over the course of seven days. The alternative hypothesis (H₁) for this experiment is that the addition of green tea extract has a significant effect on the physicochemical or sensorial properties of the samples over the course of seven days storage time.

1.5. Scope of the Study

In this study, the independent variables are the concentration (C) of green tea extract that was added to the sample during the production process and the storage period (t) of the samples. The

dependent variables that were observed include the antioxidant activity, viscosity, pH, and the sensory properties of the samples, which will be observed at Day 1, 3 and 7 in a chilled storage (15 °C). Note that the samples in Day 0 were not analysed due to two main reasons: the first reason is due to time constraint during Day 0 to analyse the samples after sample preparation. The second reason is that there may not be any differences in the results obtained for the samples with different concentrations of green tea extract as they may have not reacted nor been active yet.