

CHAPTER 1

Introduction

1.1 Background

Sweetness is one of the basic tastes incorporated in most food and beverages. It is classified as a desirable taste for human beings because it stimulates reward-related pathways in the brain, reducing stress hormones (Atmarita et al., 2018). For food to become sweet, it needs sugar or artificial sweeteners. However, there are other ways to increase sweetness levels in food and beverages without adding more sugar or sweetener concentration, one of them being colorants addition (Spence et al., 2015). Color enhances the visual and supports humans' taste perception towards the food (Bayarri et al., 2001). It is also a deciding factor for consumers to choose those foods and beverages (Clydesdale, 1993). The intensity of food color influences consumer perception about its taste (Spence et al., 2015). Besides color, food placement and size may also contribute to the consumer's perception (Spence et al., 2016). The same portion of food being put in a smaller plate will appear as if it is a larger portion compared to the food being put in a bigger plate, resulting in higher satiety of the consumer (Peng, 2017)

Some research incorporates red coloring to enhance their samples' sweetness level (Maga, 1974; Lavin and Lawless, 1998; Johnson and Clydesdale, 1982). The packaging of a food or beverage product can also increase the sweetness perception. For example, espresso served in a pink-colored cup was perceived as sweeter than the one served in a white-colored cup (Carvalho and Spence, 2019).

One of the colors that is used a lot in food and beverages is red. Aside from the food and drink itself, most food companies have red color as their logo because it increases their

appetite (Harrington, 2015). For food, red is identical with fruits, meats, wine, chili, and others. The basic taste that is strongly represented by red is sweetness (Spence and Carvalho, 2019). A study conducted by Zampini, Sanabria, Phillips & Spence (2007) shows that the color red mostly correlates with strawberry, raspberry, and cherry. Redness in a solution can also make consumers perceive that sucrose is present in the food system (Spence, Levitan, Shankar & Zampini, 2010). The relationship of color concentration with taste intensity is also proven, especially in red color; the darker shade of red gives sweeter perception from the tasters whereas the sucrose amount is the same (Clydesdale., Gover & Fugardi, 1992; Lavin & Lawless, 1998).

Unlike sweetness, spiciness can not be considered one of the basic tastes. It is a sensation in humans' tongues that builds up whenever humans consume food containing capsaicin (Yang and Zheng, 2017). Commonly, it is found in chili peppers (*Capsicum sp.*). The receptor responsible for spicy sensation is V1 (Viana, 2010). Chilli peppers have been used as condiments for over 6,000 years (Fattori, Hohmann, Rossaneis, Pinho-Ribeiro & Verri, 2016). The spiciness is also correlated with the color red. In a study conducted by Tu, Yang & Ma (2016), food served using a red plate increases humans' spiciness perception compared by using a white plate. Like sweet, the darker the red color, it is more likely to be perceived as spicier (Shermer & Levitan, 2014). In Indonesia, spicy is one of the most popular eating sensations that is desirable for many people, shown by its position in the top five countries with the highest consumption of chili and pepper in the world (Indexbox, 2017).

Since both spicy sensation and sweetness are related to the color red, the paper will discuss a significant difference in redness preference and intensity perception for each attribute.

1.2. Objective

The objective of this research is to identify the effect of different concentration to perceived sweetness and spicy sensation through indirect observation.

1.3. Hypothesis

This research hypothesizes that the panelist can perceive different taste intensity between the samples with different concentration and the higher the concentration, the likely sample perceived as more sweet or spicy applies in three different colorants.

1.4 Scope of Activity

The scope of work of this thesis is:

- Questionnaire Designing
- Sample Preparation
- Online Data Collection
- Statistical analysis

1.5 Time and Budget

Table 1. Time schedule of project activity

Activities	May				June				July				August				September			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Questionnaire Designing																				
Sample Preparation																				
Data Collection																				
Statistical Analysis																				
Finalisation																				

Questionnaires will be distributed online. The questionnaire is available in the appendix.

Table 2. Budget of project activity

	Price
Materials	30.000
Equipment	-
Total	30.000