CHAPTER II
LITERATURE REVIEW

In this chapter the writer presents about the information about spinach, the nutrient of spinach, the definition of pizza, the history of pizza, the variety of pizza, the pizza dough composition, pizza dough making process, sensory perception, and people acceptance of food product.

2.1 The Information about Spinach

According to Rukmana (2005, P. 52) spinach came from the American tropics, spinach is a vegetable crop, known by the scientific name Amaranthus spp. The word "maranth" in the Greek means "everlasting" or eternal. Spinach grows well in lowland areas to a height of 1,400 m below sea level. This plant is also frequently found growing wild by the roadside. It's ground is not maintained, fields, gardens, and others. Spinach plants require enough sun light. Air humidity is suitable for growing spinach between 40-60% and the suitable temperature for spinach plants is ranging between 16-20 degrees celsius.

There are several types of spinach such as green spinach, red spinach, white spinach. However,the most often found is the kind of amaranth Amaranthus tricolor. L. Each of the spinach contains iron and high mineral which is good for health. (Sellby 2010, p.102).

2.1.1 Types of Spinach

There are three types of spinach, namely:

a. Green Spinach

Green spinach is a kind of spinach commonly consumed by people. The shape of its leaves is small and the texture is soft, that is why people like to consume this type of spinach. This spinach is also called Amaranthus tricolor. L . Besides small leaved and soft texture, green spinach also has broad and thick. (Lingga, 2010, p.57).

b. Red Spinach

Besides green spinach, there is also red spinach. This type is also called red amaranth or blitum rubrum. The characteristic of this spinach is like the name having red stem and leaves. The height of this type is about 0.4-1 m. It has weak and watery stems, the leaves are oval shaped. (Purwaningsih, 2007, p.57).

c. White Spinach

White spinach has white greenish leaves. The shape of its leaves is rounded. The leaves are thick fleshly and soft. Spinach is also commonly found in traditional markets and modern markets. Spinach is also commonly cooked as vegetables.(Sellby 2010, p.56).

2.2 The Nutrient Content of Spinach

According to Sellby (2010, p.102). "Spinach is a vegetable contain much nutrient. Spinach is used to prevent various diseases because it protects and strengthens the body. Table 1 shows the nutrient content of every 100 gram of spinach

Tabel I

Spinach-Nutritional Facts per 100 g

No	The Nutrients	Content
1	Energy	36 kcal
2	Protein	3,5 g
3	Fat	0,5 g
4	Carbohydrate	6,5 g
5	Calcium	267 mg
6	Phosphor	67 mg
7	Iron	3,9 mg

8	Vitamin A	6.090 mg
9	Vitamin B1	0,08 mg
10	Vitamin C	80 mg
11	Vitamin K	482,9 mg
12	Magnesium	79 mg
13	Water	86,9 g
14	The Edible Parts	71 %

Sources: Devi, N. (2010, p.5)

Based on the above table, it can be concluded that every 100g spinach contains high in carbohydrate, vitamin A and C,protein and water.

2.3 Definitions of Pizza

According to John (2010, p.1) the word "pizza" is probably derived from the word "persona" Latin, meaning flat bread. Pizza is a flat, open-faced pie of Italian origin consisting of the breads and topping such as tomato sauce with seasoned and cheese. It is often garnished with meats and vegetables. This food is made from simple ingredients and easy to obtain as: flour, oil, salt, water, sugar, additives and yeast.

Merriam (2015, p.1) says that pizza is the kind of round bread, baked in the oven and usually covered with tomato sauce and cheese with other food additives that have been selected. It typically uses mozzarella cheese or "pizza cheese". Other types of material can also be placed on a pizza. These materials are usually meat, such as salami and pepperoni, ham, bacon; sauce such as tomato sauce, fruit such as pineapple and olives; chilli and vegetables such as peppers and onions, mushrooms and others. Some kinds of pizza could be given extra flavor with butter, garlic, spices, or sesame. Pizza is usually eaten when it is still hot.It is usually served for lunch and dinner, but sometimes it is served cold, usually eaten for breakfast or of picnic.

2.4 The Assorted of Pizza

According to John(2010, p.1) in the United States pizza topping is made from several ingredients such as peanut sauce, apple and bean sprout. Topping of pizza varies greatly to reflect regional preferences. For example in Japan, eel and squid are favorite toppings. In Russia, red fish is choices topping. Australians enjoy shrimp and pineapple topping. Costa Ricans love coconut topping. Meanwhile inUnited States, pepperoni is the most favorite pizza topping.

2.5 The Pizza Dough Ingredients

Pizza dough consists of several ingredients, main and addition. The main ingredients consists of flour, yeast, salt, olive oil and cold water. According to Maria(2011, p.1)" main ingredient of the pizza dough means each component is important in dough making process, and each cannot be substituted since it gives the essential function of the component in pizza dough making process". In other words the pizza dough cannot be made if one of the main component does not exist. The additional ingredient consists of mozzarella cheeseor “Pizza Cheese”. Other types of topping can be spreaded on the top of pizza, but meat such as salami, pepperioni,ham, and bacon are usually used, fruit such as pineapple, star fruit, apples are also often used.

2.5.1 Flour

Flour is derived from wheat grain. According Syarbini (2013, p.15) flour is the result of milling. Flour is one of the grain crops commonly grown in countries such as America, Canada, Europe, and Australia. There are three types of flour: high, medium and low protein contents. High protein content flour contains 13-14 % protein. Medium protein content flour contains 11.5-13 % protein. Low proteincontent flour contains less than 11% protein.

Maria (2011, p.1) says that flour is the main ingredient in the making of bread dough. Flour is used to make pizza dough is high protein flour. Proteins of flour have function to bind or to absorb water to form gluten. Gluten serves to hold the gas produced in the fermentation process. Carbohydrates of flour will absorb water into the dough together with gluten, which in the presence of heat in the oven to form gelatin. Gluten and gelatin is a framework and network on bread dough.

2.5.2 Yeast

According to Yayath (2009, p.1) yeast is a type of fungus Saccharomyces cerevisiae. There are a number of enzymes that play a role in the fermentation process. The main function of yeast in pizza dough making process is to develop the dough. The fermentation process produces gas, acid, and alcohol. Acid serves to soften the dough; it makes the dough easily formed after the second fermentation. Alcohols are liquid and volatile gases and lost in the process because of the hot oven. The ideal fermentation process when there is a balance between factors, among others:the amount of yeast, sugar, salt, water, temperature and acidity of dough. The amount of yeast depends on the type of yeast. There are several types of yeast wet, dry active and quckrise dry yeast or instant yeast. Based on cooking Essential (2010, p.745), when using unstant dry yeast it showld be taken as half of wet yeast. Since it can develop faster than wet yeast.

2.5.3 Olive oil

According to Yayath (2009, p.1) “olive oil is a fat obtained from the olive (the fruit of Oleo European; family Oleaceae), a traditional tree crop of the Mediterranean Basin. The oil is produced by pressing whole olives and is commonly used in cooking”. Olive oil is used throughout the world, People have been eating olive oil for thousands of years and it is now more popular than ever.

According to Coner (2006, p.1), in making pizza dough, it usually used cooking oil or olive oil. The original pizza is made with olive oil. Expert pizza uses darker and greener olive oil. The fragrant pizza uses darker green color and the oil. The aroma of olive oil can be replaced by margarine or butter so that the result is a richer flavor. Using olive oil will produce denser pizza than using butter or margarine.

2.5.4 Salt

Salt is able evoke the flavor or aroma. In addition, salt can also lower the temperature of the dough, it also plays an important role in causing the color of the crust. (Burhanuddin, 2001, p.1).

2.5.5 Cold water

Yayath (2009, p.1) says that water in the manufacture of bread serves as solvent all ingredients into a compact dough. Protein reacts with water to form gluten. Starchy carbohydrates react with water by heat around 64 celcius degrees or more. Water turns into steam in the oven, causing the development of the bread into the pores of the crumb. Water requirements for bread is neutral pH, normal mineral content (hardness 150-300 ppm) and feasible for absorbing water.

According to Maria (2011, p.1), in making pizza dough, it needs warm water. The temperature is medium. It is not too cold and not too hot. It is between 100 – 110 celcius degrees. Cold water would not revive the yeast. Hot water would kill the yeast and as the result the dough will not rise.

2.5.6 Sugar

Sugar serves as a sweetener of the bread. Sugar is also useful to smooth the cell structure, to give color of the crust, keep the moisture, to extend the shelf life, and to softening the cell structure (Faridah, 2008). Sugar used in the manufacture of bread is refined sugar or granulated sugar. Using refined grains sugar produces flat and soft pizza. The sugar can be used by applying creaming or sponge technique. (Hamidah, 1996, p.117)

2. 6 The topping of pizza

According to John (2010, p.1) “topping isoften used on pizza is mozzarella cheese or "pizza cheese" or tomato sauce. Other types ofingredients that can also be placed on top of the pizza are meat, such as bacon, smoke beef, chicken, and sausage, sauce such as tomato sauce, white sauce (bechamel) and chili sauce, fruit such as pineapple,starfruit, dragon fruit and apples, vegetables such as peppers, onions, sweet corn, tomato and others. The function of topping is making to a new taste for the dough or the color of the dough.

2.7 Pizza Dough Making Process

According to Maria (2011, p.1), basically there are six steps of pizza dough making process. The process can be followed whether pizza dough is processed manually or by using machine such as mixer. Bread machine will be easier for the making process of pizza dough.

The pizza dough making process based on to Maria (2011, p.1) is as the following:

First of all, weighing the ingredients, each ingredient should be weighed exactly based on recipe's needs. The quality of the pizza dough is determined by

the ingredients. The amount of each ingredient has correlation to others. It means one has influence to another. If one ingredient is decreased other should also be decreased.

The second, mixing and kneading dough in a small bowl, sprinkle the yeast on the warm water and stir to dissolve it. Set aside until the yeast starts forming bubbles in about 5 minutes. Then sift the flour; pour the flour into a large bowl or on a work surface. Put the flour in a mound shape with a hole in the center. Pour the yeast mix in the center, then pour the olive oil and a pinch of salt.

Then mix by using hands to form dough. Sprinkle some flour on the work surface. Place the pizza dough on the floured surface. Knead the pizza dough briefly with hands pushing and folding. Knead just long enough for the dough to take in a little more flour, and until it no longer sticks on hands.

The third, spread a little olive oil inside a bowl. Transfer the dough into the bowl. On the top of the pizza dough, make two incisions that cross, and spread with a very small amount of olive oil. Maria (2011, p.1) said that this last step will prevent the surface of the dough from breaking too much while rising. Cover the bowl with a kitchen cloth, and set the bowl aside for approximately 1½ – 2 hours until the dough doubles in volume. The time required for rising will depend on the strength of the yeast and the temperature of the room.

Fourth, dividing the dough when the dough is about double its original size, punch it down to eliminate the air bubbles. On a slightly floured work surface, cut the dough into three equal pieces and then on the work surface, using a rolling pin and hands, and then shape one piece of dough into a thin round layer. Make a pizza about 12 inches in diameter and transfer it to the pan. Using the fingertips, push from the center to the sides to cover the entire surface of the pan with a thin layer of pasta and repeat this step with the other 2 dough pieces to make 3 pizzas.

The fifth, spreading the toppings. At this point, the pizza is ready to receive its toppings. Add onto the pizza the preferred toppings. It can be sprinkled with a pinch of salt and pepper.

Finally is baking. Bake the pizza in a regular oven at 500 degrees or 200 degrees for about 15–20 minutes. The cheese should be added 5 – 10 minutes before removing the pizza from the oven. To check for readiness, lift one side of the pizza. The pizza is cooked when the bottom surface is light brown.

2.8 Sensory perception

There are two meaning of perception based on cambride dictionary onlile (www. vocabulary.com/dictionary): perception is the quality of being aware of thing through the physical senses, especially sigh, moreover it states that perception is someone's ability to notice and understand things that are not obvius to other people. Meanwhile based on vocabulary.com (www.vocabulary.com.dicti onary) sensory perception is the sensation that result when taste buds in the tongue and throat information about the chemical composition of a soluble stimulus. Based on the theories above, it can be concluded that sensory perception is the ability to understand which express the information what taste bud in the tounge and throat feel.

According to Lawless and Heymen(1999) "sensory perception of food quality includes, taste,aroma, texture, flavor, and appearance. Taste is the ability of the tounge to differentiate several senses such as sweet, sour, salty, sour, bitter or umami. According to Puckette (Winefolly.com), taste refers to the senses inside our mounth including tongue. Aroma occurs inside our noses and relates specifically to our sense of smell. Flavor is when taste and aroma converge. it is about aftertaste of after the food is swallowed up.

2.9 People Acceptance of food product

Based on Merriam webster dictionary (Merriam Webster.com) Acceptance is an agreeing either expressly or by conducting to the act. Meanwhile according to Gengler (sensory testing service.com) Acceptance of food product relates to liking or acceptability. People acceptance of food product is how much the people express their like or dislike to the product.