CHAPTER II

LITERATURE REVIEW

2.1 Food Diversification

Effendi (1996, p.109) argues that the diversification of products is defined as an extension of the selection of goods and services sold by the company by way of adding a new product or service or improving type, color, fashion, size, type of existing products in order to gain maximum. Similar to Effendi, Tjiptono (2001, p.132) argues that the definition of product diversification effort is to find and develop new products or new markets, or both, in order to pursue growth, increase sales, profitability and flexibility.

Moreover, the Government Regulation Number 68 of 2002 about Food Security, mentions that food diversification is to increase the consumption of a variety of foods with the balance principles nutrition. It means that for choosing the type of food not only considering the elements of nutrition cause body needs the content of energy, proteins, carbohydrates, fats, vitamins and minerals but also considering the food with a role as a functional food.

Meanwhile, Cahyani (2008) makes it detail which states that diversification can be grouped into three kind, they are vertical, horizontal, and regional. Horizontal diversification is an attempt of diversifying of products produced (supply side) and the products is consumed (demand side) at the level of individuals, household and companies. In horizontal principle diversification is diversified among commodities. Vertical synchronization diversification is a staple product development efforts into new products for the purposes of consumption level. In principle, vertical synchronization diversification is a development effort after harvest. It includes processing activities and agricultural waste. Vertical synchronization diversification

intended to an increase the added value of food commodities to make it more efficient for human.

From the explanation above it can be concluded that food diversification means the way to improve the previous product. It usually relates to create the new variation or innovation to make the product more attractive. Diversification of food can be used not only with the main ingredients, but also can be used with the alternative ingredients. The alternative ingredients should have the same nutrition with the main ingredients to have the balanced nutrition.

2.2 Information about Red Beans

Picture 2.1 Red Beans

Red beans has scientific name, it is Phaseolus Vulgaris. Sugeng (2014) states that red bean plants belonging to vines plants that require buffering when growing. Red bean plant has compound leaves and it grows at a height of about 3.5 m to 4.5 m. Meanwhile its fruit has the shaped pods and elongated. In one pod, there are usually 2 to 3 seeds of the beans. The shape of red bean has higher measure than the seed of green bean or long bean. The color of red bean skin is dark red. If the seeds peeled, they will look white.

2.2.1 The Nutrition of Red Beans

Red beans are rich in folic acid, calcium, complex carbohydrates, fiber, and high protein. The content of complex carbohydrates and high fiber in beans makes it can avoid the risk of anemia. The glycemic index of red beans is also has benefit for people to avoid diabetes and reduce the risk of diabetes (Anonymous, 2009). Besides, Nurfi (2010) also argues that red bean is the source of relieable to a complex carbohydrate, fiber, vitamin B (especially folic acid and vitamin B1). Every 100 gram boiled red bean can provide protein about 19-21percent.The table below indicates the nutrients in red beans.

Table 2.1 Nutrition Fact of Red Beans per 100g

Nutrient	Unit	Value Per 100 g (Raw)
Main Components		
Water	g	11.75
Energy	kcal	333
Protein	g	23.58
Total lipid (fat)	g	0.83
Carbohydrate	g	60.01
Fiber, total dietary	g	24.9
Sugars, total	g	2.23
Minerals		
Calcium, Ca	mg	143
Iron, Fe	mg	8.20
Magnesium, Mg	mg	140
Phosphorus, P	mg	407
Potassium, K	mg	1406
Sodium, Na	mg	24
Zinc, Zn	mg	2.79
Vitamins		
Vitamin C, total ascorbic acid	mg	4.5
Thiamin	mg	0.529
Riboflavin	mg	0.219
Niacin	mg	2.060
Vitamin B-6	mg	0.397
Folate, DFE	micrg	395
Vitamin E (alpha-tocopherol)	mg	0.22
Vitamin K (phylloquinone)	mg	19.0
Lipids		
Fatty acids, total saturated	g	0120
Fatty acids, total monounsaturated	g	0.064
Fatty acids, total polyunsaturated	g	0.457

(Sources: United States of Department Agriculture, 2011)

2.2.2 The Benefits of Reed Beans

Red bean is one of food that has several benefits for body health. Anonymous (2015), as cited in official website http://www.diyhealthremedy.com/top-15-health-benefits-of-red-beans/ (2015), there are fifteen benefits of red beans, namely;

1. As the source of protein

Red beans contain high amounts of nutrients like copper, folic acid, magnesium and phosphorus. It contains vitamins, zinc, iron, omega fats and fiber also. It is very good source as plant proteins for vegetarians.

2. As the source of antioxidants

Antioxidants are nutrients that protect the body from free radical damage. Red beans contain very high antioxidants, which helps in preventing several diseases such as heart diseases.

3. Preventing diabetes

Diabetic patients can control their disease by eating red beans. It contains fiber, which helps in controlling blood sugar levels after eating food. It has a low glycemic index food.

4. Digesting of health

Red beans are very good for digestion. It contains insoluble fiber, which prevents the problem of diarrhea. It is also useful for treating bloating and flatulence.

5. Preventing obesity

Since red beans help in controlling blood sugar, it is useful for preventing and controlling obesity. It contains nutrients that help in loss weight by reducing the body fat.

6. Preventing hypertension

Someone who suffers hypertension can improve their health by eating red beans. Potassium and magnesium content in red bean helps control blood pressure levels.

7. Improving mental function

Red beans contain thiamine, which helps in improving mental function.

8. Preventing muscle cramps

The problem of muscle cramps can be cured by eating red beans. The beans contain magnesium, potassium, calcium, and electrolytes which help in treating muscle cramps.

9. Preventing anemia

Eating red beans can help in preventing and curing anemia. Since the beans are rich in iron, it is very effective in treating anemia symptoms caused by iron deficiency.

10. As anti aging

Red bean has anti-aging properties due to antioxidants and flavonoids present in it. Thus, it helps in slowing and preventing the signs of aging.

11. Preventing high cholesterol

The bean helps in reducing the cholesterol levels. So that it could be useful for someone who suffers from high cholesterol.

12. Preventing heart health

Red beans are very beneficial for heart health. It contains nutrients that make the heart health while preventing and controlling heart disease. It contains folate, a nutrient that controls heart disease by removing homocysteine from the body.

13. Improving immunity

Eating red beans can improve someone immunity. The beans contain nutrients like fiber. Thus, it can protect from infections and other disease.

14. Making healthy pregnancy

Red beans are very good for pregnant women. It contains nutrients that are required for development of baby in womb. Thus, the beans help in having a healthy pregnancy and safe childbirth.

15. Preventing colon cancer

Colon cancer can be prevented by eating red beans. Studies have shown that nutrients of these beans have anti-cancerous properties and it prevents colon cancer.

2.3 Information about Cakes

Cake is one of the products which has sweet taste, rich in sugar, and fat. Thia product is from baking. Cake contains flour, sugar, salt, eggs, milk, water, and fat (Hamidah, 2009). Meanwhile Purwati (2016), states that a cake can be made using 3 ingredients namely flour, sugar, and egg. Cake also called Bolu. Bolu is kind of pastry product that uses flour, sugar, and eggs as the main ingredients which is baked or steamed (Veranita, 2012).

2.3.1 The Information of Bolu Kojo

Bolu Kojo is one of the traditional cake from Palembang. It is called bolu kojo because at that time the shape of this cake likes frangipani flower (Bunga Kamboja). The taste of this cake is very sweet and also has soft texture. As traditional cakes, fat used in bolu kojo is coconut milk which gives specific taste to this cake. In the past bolu kojo was only served on custom events.

Nowadays bolu kojo can be in layered form or shaped in oval single molds, and this traditional cakes are sold in cake shops and market. Commonly, bolu kojo has green color, the green color come from screwpine leaf (daun pandan). Bolu kojo not only has green color but it also has purple color that come from purple sweet potato and the yellow color that come from pumpkin.

2.3.2 The Information of Bolu Mentega (Butter Cake)

As cited in official website Neti (2015) bolu mentega has dense texture. Bolu Mentega has several kinds such as chocolate butter cake, cheese butter cake, banana butter cake, etc. The technique of making this cake is easy for beginner who want make a cake. The techniques are:

1. Margarine or butter whipped first until completely soft
2. Then add the refined sugar and eggs one at a time while continuing to be shaken until fluffy
3. Then add the sifted flour gradually to the egg mixture and stir using a spatula

2.3.3 The Information of Bolu Lapis

Bolu lapis is a cake that has several layers. There are some cakes that has layers such as rainbow cake, lapis legit, bolu lapis chocolate, etc. Commonly the batter of each layers in bolu lapis consist of flour, margarine, eggs, and sugar. Besides, the batter can also be added with food flavor or others.

2.4 The Basic Ingredients of Cakes

Veranita (2012), as cited in official website http://www.resepchef.com/cara-membuat-bolu-irit-hanya-3-bahan/, there are 3 ingredients for making Bolu namely flour, eggs, and, sugar.

2.4.1 Flour

Flour is the most important ingredient in pastry product. Flour produces several kinds of products such as cakes, breads, pastries, biscuits, etc. Flour has three types based on the content of protein, namely low protein, medium protein, and high protein (Gisslen, 2012).

Similar to Gisslen (2012), Murdani (2010) also states that the functions of flour based on the nutrient of protein are;

1. Hard Flour or also called high protein flour. The level of protein that contains in this flour is around 12-13%, for example Cakra. Therefore, it fits very well, in order to make the batter that requires level of the elasticity and suppleness. The processed food that usually uses these flour has expands, soft, supple, as well as elastic. For instance, bread, pasta, noodles, and others.
2. Medium Flour, the level of protein that contains in this flour is around 9.5-10%, for example Segitiga Biru. Flour with medium levels of protein is called as the versatile or all purposes flour. For example in order to make cake, sponge, a banana cake, brownies, sponge cake, waffles, sweet breads, batternut, etc.
3. Soft Flour or also called low protein flour. The level that contains in this flour is around 7-8.5%, for example Kunci Biru. The low protein flour usually used to make cookies, crackers, shortbread, etc.

It can be concluded that flour is the main ingredients in the process of making cakes. The flour that the writer used in this cake of this final report is flour with medium protein content.

2.4.2 Egg

Egg is one of the sources of animal protein which has delicious taste, easy to digest and highly nutritious. In culinary, eggs has the function as batter improver, forming the color, improving the taste, increasing nutrition value, as softener, as an essence enhancer, and source of nutrient. Eggs have two elements of the yolk and egg white. The yolk contains 50 % water, and the white contains 87% water. In the egg yolks also contains lesitin that serves as emulsifier which has the ability to hold the salt and fat. The yolk also serves as a preservative, the more egg yolk is used the denser cake will be, otherwise the more egg white is used the softer and stickler the cake will be (Tarwotjo, 2004).

It can be concluded that egg has an important role in making a cake, because eggs have several functions such as improver of batter, forming the color, improving the taste, and as a source of nutrients. While, the highest value found on the yolk because egg yolk has lesitin that serves as emulsifier which has the ability to hold the salt and fat.

2.4.3 Sugar

Sugar is a simple carbohydrate that becomes the sources of energy. Sugar is used to make the flavor become sweet in food and beverage (Santoso, 1999). Moreover, Hall (2012) as cited in official website http://www. wsro.org/About Sugar/Factsabout Sugar.aspx (2012), sugar is a class of carbohydrates and thus one source of food energy. Carbohydrates can be divided into different groups, namely: sugars; oligosaccharides and polysaccharides. Sugars can be further divided into 2 classes: monosaccharide and disaccharide.

Monosaccharide is single unit sugar. Those commonly found in food are:

- glucose (often called blood sugar)
- fructose (one of the main sugars found in fruit – the others are sucrose and glucose)
- galactose (found in milk)

Disaccharides consist of two monosaccharide linked together. Those commonly found are:

- sucrose (table sugar) = glucose + fructose
- lactose (milk sugar) = glucose + galactose
- maltose (malt sugar) = glucose + glucose

There are also several functions of sugar in foods based on official website http://www. wsro.org/About Sugar/Factsabout Sugar.aspx (2012), namely;

- Providing sweetness
- Serving as preservatives in jams and jellies
- Increasing the boiling point or reduces the freezing point of foods
- Reacting with amino acids to produce color and flavour compounds

2.5 Organoleptic Testing

There are several definition that states about organoleptic testing, for instance Rianita (2014) argues that organoleptic is a testing of food based on favorite and a willingness to use a product. The organoleptic or the senses or the sensory itself is a way of testing by means of the sensors humans as the main tool for measurement of acceptance of the product. Organoleptic testing has an important role in the implementation of the quality. Besides, Rahayu (2013) makes it short by argues that Organoleptic is a method used to test the quality of an ingredient or products using the human senses. In this aspect that can be color, taste, aroma and texture. Organoleptic is one of very important component in the analysis of the product quality. Indeed, it can be concluded that organoleptic is the testing of food based on human sense in aspect of color, taste, aroma and texture of product.

Organoleptic divided into three types, namely Discriminative Test, Descriptive Test, and Affective Test (Lawless, Heyman 2010, p 103). Discriminative Test is the testing used to determine whether there are differences between the examples of the product. Meanwhile, Descriptive Test is the test used to identify underlying ingredient and process variables, and or to determine which sensory attributes are important to acceptance. Then, Affective Test is used to know whether the product is liked or disliked in some absolute sense.

In this final report, the organoleptic testing that used is descriptive testing. This techniques are ideal for shelf-life testing, especially if the judges are trained and are consistent over time. Descriptive technique is frequently used in product development to measure how close a new introduction is to the target or to assess suitability of prototype products. In quality assurance, descriptive techniques can be invaluable when the sensory aspects of a problem must be defines (Lawless, Heyman 2010, p 227).

2.6 Recipe Book

Suhaerik S (2015) states that recipe book is defined as the knowledge of making food or dishes with knowing the difficulty. However there are some requirements to arrange the recipe book, namely:

a). writing the name of food

b). writing the ingredients

d). writing tools that required

e). writing the instructions clearly and concisely

f). writing how to serve the food.

It can be concluded that the function of recipe book is to give the clear informations including instructions in making a food. From recipe book someone can know what ingredients that should prepare and also what tools that required. The recipe book in this final report will be as the printed material.