

## CHAPTER II

### LITERATUR OVERVIEW

#### 2.1 Ingredient Review

##### 2.1.1 Lentil

Lentils are one of the foodstuffs that contain a high total fiber content compared to similar beans, which is 13%. To optimize the benefits of lentil starch, modifications were made to the starch to high fiber content. Lentils contain the highest antioxidants compared to other types of beans. The carbohydrate content of lentil also higher than soybeans. Lentils contain 10% water, 22.7% protein, 13% fiber, 50% carbohydrates, 2.60% ash, and 2% sugar, and there are also quite a few minerals in the form of potassium and phosphorus, as well as other mineral content such as calcium, sodium, iron, zinc, manganese, copper, and selenium (Pratita and Faturhman, 2021).



**Figure 2. 1** Red Lentil

Lentils contain quite high in carbohydrates, so allows it to be made into starch. Modification of the starch can produce high levels of dietary fiber, so can be used as food functional.

**Tabel 2. 1** Composition of lentil

No	Sample Name	Insoluble Fiber Content (%)	soluble Fiber Content (%)	Food Fiber Content (%)
1	Kacang Lentil merah	17,07	8,65	25,72
2	Kacang lentil hitam	23,67	1,38	25,05

The results of the research on the food fiber content of red lentils and black lentils were not significantly different; for red lentils, it was 25.72% and for black lentils, it was 25.05%. What differentiates them is the content of insoluble dietary fiber and soluble dietary fiber. Insoluble dietary fiber in red lentils is 17.07%, and for black lentils it is higher, namely 23.67%. Meanwhile, the soluble dietary fiber content in red lentils is 8.65%, while in black lentils it is 1.38%.

Insoluble fiber is water-insoluble fiber, however has the ability to absorb water and improve the texture and volume of the stool, for example, cellulose, hemicellulose, and lignin. Meanwhile, soluble fiber is fiber which dissolves in water later, forms a gel in the digestive tract by absorbing water, for example is gum. Insoluble fiber can shorten intestinal transit time by absorbing air in the colon so that the volume of feces becomes large and stimulates the nerves in the rectum to defecate, causing contact between irritating substances and the colorectal mucosa to become short, so it can prevent disease in the colon and rectum (Kusharto, 2007). Soluble fiber will dissolve in water and form a gel in water. This gel can causing a decrease in speed pushes food material into the intestines in the digestive tract so that nutrients can be completely absorbed, Apart from that, it can also stimulate the excretion of bile acids into the intestines so that they are absorbed cholesterol and fat slow down (Suryani, 2018). (Palupi et al., 2012). So, it can be said that red lentil and black lentils contains a lot of insoluble fiber.

### 2.1.2 Rice flour

Rice flour can be used as substitute for wheat flour because it is produced in Indonesia is high. Rice supplies at Indonesia in 2014 reached the figure 42,269 tons, and there are still 1,067 tons scattered rice (Ministry of Agriculture, 2015). (Besides that, Rice flour is nonallergenic, so you can consumed by everyone, including humans who have a gluten allergy. One of the noodle products made from rice flour, which is quite well known in Indonesia, it is rice kwetiau.

**Tabel 2. 2** Composition from rice starch

Component	Composition
Calori (cal)	364,00
Protein (g)	7,00
Fat (g)	0,50
Carbohydrate (g)	80,00
Calsium (mg)	5,00
Phosphor (mg)	140.00
Iron (mg)	0,80
Vitamin B1 (mg)	0,12
Water (g)	12,00

### 2.1.3 Tapioca starch

Tapioca flour is generally in the form of starch granules that are abundant in the cells cassava tubers (Razif, 2006; Astawan, 2009). However, kwetiau, which is made from rice flour, has a less chewy texture and low nutritional value. This is because rice flour contains high amylose, so it tends to produce a hard gel consistency after the ripening process (Mutters & Thompson 2009). One way to improve the texture, making kwetiau can be modified by add tapioca. According to Hardoko et al. (2013), adding tapioca at a proportion of 5%, 10%, 15%, 20%, 25%, and 30% can increase the elasticity of kwetiau in comparison to using tapioca flour.

**Tabel 2. 3** Nutritional Content of Tapioca Flour (Soemarno, 2007)

<b>Composition</b>	<b>Quantity</b>
Calori ( per 100 gr)	363
Carbohydrate (%)	88,2
Kadar air (%)	9,0
Lemak (%)	0,5
Protein (%)	1,1
Ca (mg/100 gr)	84
P (mg/100 gr)	125
Fe (mg/100gr)	1.0
Vitamin B1 (mg/100 gr)	0.4
Vitamin C (mg/100 gr)	0

## **2.2 Product Review**

Noodles are one of the most delicious foods known and widely consumed in Indonesia. However, most noodles in Indonesia are made from flour (Hardoko, et al. 2013). Kwetiau is a type of noodle that is flat and wide, which is one type of A popular food in Asia, especially in East Asia and Southeast Asia. Kwetiau classified into two groups, namely: wet kwetiau, which

Contains Water quite tall, breaks down quickly, and lasts 1 day if not put in the cupboard. cooler; dry kwetiau, like other types of instant noodles, can last long if packaged airtight. In the process of making instant kwetiau with composite flour, a number of main and additional ingredients are required. Every ingredient has a specific role, such as increasing weight, volume, or quality. taste, and color.

Hormdok and Noomhorm (2007) stated that kwetiau is a type of noodles made from rice and Hasan (2013) complements that kwetiau has noodle-like shape with a clear white color with a flat and wide shape and made from rice flour, so it can be used as a substitute for rice.

The development of kwetiau that can be carried out includes texture modification by using hydrocolloids found in Indonesia, namely tapioca flour. According to BeMiller and Whistler (2009), tapioca flour is gluten-free and

contributes to a supple and elastic texture. The addition of lentils will make the kwetiau high in fiber because lentils contain 25,72% which is high level in dietary fiber

### **2.3 Process Review**

Steaming is a way to cook food by using water vapor in a closed water container. This method is very useful for maintaining the nutrition of the food being made. The advantage of the steaming method is that it reduces the use of oil so that it can prevent fat from accumulating in food.

Steaming is a cooking process with the resulting hot water vapor medium by boiling water. By looking at the nature of the acid volatile cyanide, then steaming can be one way of processing bamboo shoots. To reduce the levels of cyanide acid found in bamboo shoots. (Yuliani Aisyahet al, JTIP).

Some studies use steaming time different kwetiau, namely 5-6 minutes (Thomas et al. 2014). In this research, the formulation that produces the most texture preferred by the panelists was the formulation with using 20% tapioca flour and steamed for 4 minutes. Cooking oil (0.5 mL, sunflower) was brushed onto a baking pan (6 × 2 inch round pan) and the batter (120 mL) was poured gradually and smoothly onto the oiled baking pan. The baking pan was placed in a steamer (Well Company Model 288128, China) closed with a lid and steamed for 5-6 min or until cooked (Thomas et al., 2014). Depending on the recipe and size of the pan if the steam process takes too long, the surface of the kwetiau will be dry, and the texture will be stiff. So it has to be adjusted to the size of the pan