

## CHAPTER II PRODUCT DESCRIPTION

### 2.1 Product Description

Black Rice Milk Kefir is a healthy beverage made from black rice and kefir grain. The taste of this product besides little bit acid also has little flavor of alcohol and soda, which makes the taste fresher and the combination of carbon dioxide and alcohol produce the foam that creates the sizzling character in end product.

### 2.2 Materials

#### 2.2.1 Black Rice



**Picture 2.1 Black Rice**

Black rice is local varieties of rice containing different pigments with white rice or other colored rice ie anthocyanin pigments. The black rice is known by the people by the name of Beras Wulung in Solo, and is also called Gadog rice in Cibeusi area, West Java. The black rice in Sleman is known as Cempo Ireng rice or Jlitheng rice, and in Bantul known as Melik rice (Balai Besar Penelitian Tanaman Padi, 2010).

According to ancient Chinese legend, black rice was so rare, tasty, and nutritious that only the emperors were allowed to eat it. Like brown rice, black rice is full of antioxidant, which is found in the outer layer that gets removed during the milling process to make white rice. But only black-rice contains the antioxidants known as anthocyanins, purple and reddish pigments -- also found in blueberries, grapes, and

acai -- that have been linked to a decreased risk of heart disease and cancer, improvements in memory, and other health benefits.

Oki *et al.*, (2001) says that black rice (*Oryza sativa L.indica*) has a pericarp, aleuron and endosperm that colours are deep red-blue-purple. The colour indicates the presence of anthocyanin. Black rice has dietary fiber and hemicellulose content of 7.5% and 5.8%, while white rice has only 5.4% and 2.2%.

Anthocyanins are known to have antidiabetic properties. This is caused by the antioxidant activity of anthocyanin that can increase the antioxidant defense system in the body against free radicals. The increased of antioxidant defense systems in the body will reduce the condition of oxidative stress as indicated by the increase in total capacity of antioxidants, antioxidant enzymes, and decreased marks of oxidative stress levels such as plasma MDA and the result of DNA oxidation by free radicals.

### 2.2.2 Kefir Grain



**Picture 2.2 Kefir Grains**

Kefir grains are symbiotic bacterial colonies together with other elements forming a dense network. Kefir Grains contains more than 35 probiotic bacteria that are very beneficial to health. The origin of the name Kefir is presumably from the Turkish 'Keif', which means a good state or condition. From its form, kefir is different from yoghurt which is also the result of milk fermentation. Kefir is in the form of liquid, while yogurt is viscous.

The levels of lactic acid kefir are ranged from 0.8-1.1%, 0.5-2.5% for alcohol, little carbon dioxide gas, vitamin B, diacetyl and acetaldehyde. The composition and nutritional content of kefir are 89.5% water, 1.5% fat, 3.5% protein, 0.6% ash, 4.5% lactose with pH 4.6. These components and compositions vary, depending on the type of starter microbes, temperature, fermentation time, and the raw materials used (Armeinachevana, 2012).

Kefir grains are shaped like cauliflower, yellowish-white with a diameter of each grain of 2-15 mm and the weight of each grain is only a few grams. Kefir is obtained through the process of fermentation of pasteurized milk using starter in the form of kefir grain, ie white or cream beads of bacteria, such as *Streptococcus sp.*, *Lactobacilli* and some non-pathogen yeast / yeast species. Bacteria plays a role in producing lactic acid and flavor components, while yeasts produce charcoal or carbon dioxide and a little alcohol. That is why the taste of kefir besides the acid also has a little taste of alcohol and soda, which makes the taste more refreshed and the combination of carbon dioxide and alcohol produces froth that creates a sizzling character in the product.

This is how to take care of kefir grain :

1. Pasteurize the fresh milk.
2. Let it cool until it reach room temperature.
3. Put the kefir grain inside the pasteurized milk.
4. Do fermentation for 1 night.

If the step is true, the kefir grain quantity will be many more because the kefir grains received the good nutritions from the milk.

### 2.2.3 Drink Water





### **Picture 2.3 Drink Water**

Drink Water is a safe enough for drinking and food preparation.

#### **2.2.4 Granulated Sugar**



**Picture 2.4 Granulated Sugar**

Sugar is the generic name for sweet, soluble carbohydrates, many of which are used in food. There are various types of sugar derived from different sources. Simple sugars are called monosaccharides and include glucose (also known as dextrose), fructose, and galactose. The "table sugar" or "granulated sugar" most customarily used as food is sucrose, a disaccharide of glucose and fructose. Sugar is used in prepared foods (e.g., cookies and cakes) and it is added to some foods and beverages (e.g., coffee and tea). In the body, sucrose is hydrolysed into the simple sugars fructose and glucose.

### **2.3 Equipment and Tools**

#### **2.3.1 Spoon**



### **Picture 2.5 Spoon**

A spoon is a utensil consisting of a small shallow bowl, oval or round, at the end of a handle. It is used primarily for serving. Spoons are also used in food preparation to measure, mix, stir and toss ingredients. Present day spoons are made from metal (notably flat silver or silverware, plated or solid), wood, porcelain or plastic.

### 2.3.2 Kitchen Digital Scale



### **Picture 2.6 Kitchen Digital Scale**

Kitchen digital scale is a kitchen device used to measure the weight of ingredient and other food. Using a scale will result in a more accurate measurement of the ingredients than by measuring it by volume. Scales are usually available in manual and digital models.

### 2.3.3 Blender



### **Picture 2.7 Blender**

A blender is a kitchen device used to mix, purée, or emulsify food and other substances. A blender consists of a blender jar with a rotating metal blade at the bottom, powered by an electric motor in the base. Some powerful models can also crush ice. The newer immersion blender configuration has a motor on top connected by a shaft to a rotating blade at the bottom, which can be used with any container.

#### 2.3.4 Plastic Strainer



**Picture 2.8 Plastic Strainer**

Strainer is a kitchen device that is most used to strain liquids away from other ingredients but also to occasionally sift fine ingredients away from larger ingredients. The strainer may be formed as a spoon-shaped utensil or a basket-shaped strainer from various materials such as metal, nylon or cloth. Some strainers with mesh screens have various densities of screening that range from fine to very coarse screens. Finer screens keep very tiny particles from being released while the more coarse strainers are often used simply to hold or retrieve larger food items such as fried foods that are removed from hot oils as they cook.

### 2.3.5 Glass Bottle



**Picture 2.10 Glass Bottle**

A glass bottle is a bottle created from glass. Glass bottles can vary in size considerably. Common uses for glass bottles include food condiments, soda, liquor, pickling and preservatives. These types of bottles are utilitarian and serve a purpose in commercial industries.

## 2.4 Production Methods

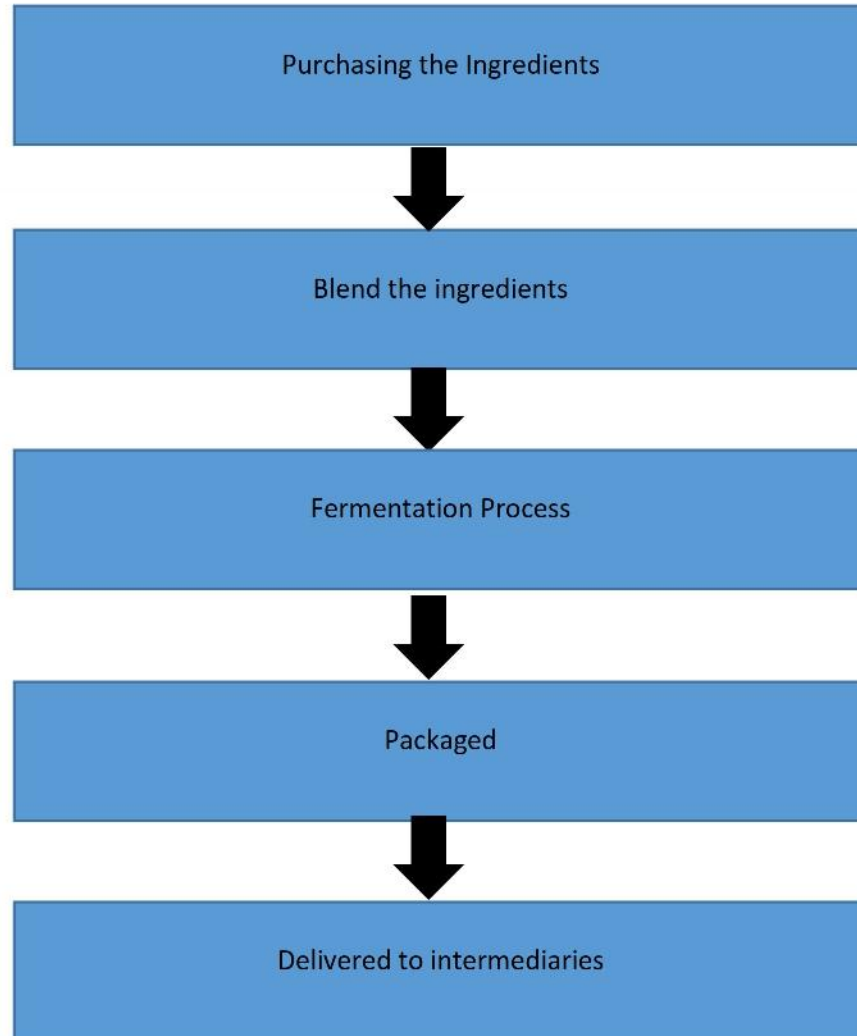
### 2.4.1 Storage



**Picture 2.13 Storing Procedure**

Note : \*Dry ingredients are stored on the container, the fresh ingredients are stored in refrigerator.

#### 2.4.2 Standard Operational Procedure (SOP)



**Picture 2.14 Standard Operational Procedure (SOP)**



### 2.4.3 Procedure



### Picture 2.15 Procedure

Procedure :

1. Wash the black rice 3-4 times.
2. Soak the black rice 24 hours (1 night) with a ratio water : black rice = 3 : 1.
3. Blend the black rice that has been soaked with water soaked.
4. Filter and remove the waste.
5. Add 5% of sugar.
6. Add 5% of kefir grain.
7. Do anaerobic fermentation for 24 hours at room temperature and put it at dark place.
8. After 24 hours, strain the fermented product.
9. Black Rice Milk Kefir is ready to serve.

#### 2.4.5 Hygiene and Sanitation Procedures

- Washing hand before and after production process.
- Wash all the necessary ingredients before processing.
- Make sure all used equipment is clean.
- Make sure the kitchen in in clean condition before and after the production process, and spraying with a liquid sanitizer specifically for removing grease and bacteria.
- Provide the trash bin.
- Ensure the absence of cross contamination, both in terms of storage material as well as equipment.
- Ensuring the water condition used is good.
- First in First out (FiFo) ingredients.
- Once in a month, we will call pest control to clean and total check the kitchen from pests, such as cockroaches or rats.
- give a briefing on the importance of personal grooming regularly (such as procurement gloves, hair nets, masks, and not allowed to use nail polish).

## 2.5 Material's Nutrition Raw

### 2.5.1 Black Rice

<b>Nutrition Facts</b>	
Serving Size 1/3 Cup (60g dry)	
Serving Per Container 7	
Amount Per Serving	
<b>Calories</b> 200	Calories from Fat 20
%Daily Value*	
<b>Total Fat</b> 2g	<b>3%</b>
Saturated Fat 0g	<b>0%</b>
Trans Fat 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 0mg	<b>0%</b>
<b>Potassium</b> 175mg	<b>4%</b>
<b>Total Carbohydrate</b> 43g	<b>14%</b>
Dietary Fiber 3g	<b>10%</b>
Sugars 1g	
<b>Protein</b> 6g	<b>13%</b>
Vitamin A 0%	• Vitamin C 0%
Calcium 0%	• Iron 6%
Manganese 120%	• Magnesium 20%
Phosphorus 20%	• Molybdenum 35%
Selenium 4%	• Zinc 8%

\* Percent Daily Values are based on a 2,000 calorie diet.

Picture 2.16 Black Rice Nutrition Raw

This rice provides the richest nutritional value, providing a higher level of vitamins, minerals and fiber of any bran rice, as well as a comprehensive range of amino acids, proteins, vegetable fats and essential trace elements needed by the body.

Like brown rice, black rice is full of antioxidant-rich bran, which is found in the outer layer that gets removed during the milling process to make white rice. But only black-rice bran contains the antioxidants known as anthocyanins, purple and reddish pigments -- also found in blueberries, grapes, and acai -- that have been linked to a decreased risk of heart disease and cancer, improvements in memory, and other health benefits. Black rice is also a good source of iron, which

can be hard to get for plant based eaters who rely on grains and legumes for protein.

### 2.5.2 Kefir Grain

<b>Nutrition Facts</b>		
Serv Size 1 Cup Prepared (240ml)		
Servings: Unlimited*		
Amount Per Serving	Culture Only	Prepared*
<b>Calories</b>	<b>0</b>	<b>45</b>
% Daily Value**		
<b>Total Fat</b> 0g	<b>0%</b>	<b>0%</b>
<b>Sodium</b> 0mg	<b>0%</b>	<b>0%</b>
<b>Total Carb</b> 0g	<b>0%</b>	<b>4%</b>
Sugars 0g		
<b>Protein</b> 0g		
Calcium	0%	2%
Iron	0%	2%
Not a significant source of Calories from Fat, Saturated Fat, Trans Fat, Cholesterol, Fiber, or Vitamins A and C.		
*See package directions for preparation and maintenance of starter. Starter may be reused with proper care and feeding.		
**Percent Daily Values are based on a 2,000 calorie diet.		

Picture 2.17 Kefir Grain Nutrition Raw

Kefir grain contains symbiotic microflora, of which about 80% *lactococci* and *Leuconostoc* spp, 10-15% yeast, and 5-10% *lactobacilli*. (Debbby, 2011).

### 2.5.3 Drink Water

<b>Nutrition Facts</b>	
Serving Size: 8.0 fl. oz. (240 ml)	
Servings Per Container about 2	
Amount Per Serving	
<b>Calories</b> 0	Calories from Fat 0
<b>Total Fat</b> 0 g	0%*
<b>Trans Fat</b> 0 g	0%*
<b>Sodium</b> 0 mg	0%*
<b>Potassium</b> 0 mg	0%*
<b>Total Carbohydrate</b> 0 g	0%*
<b>Sugar</b> 0 g	
<b>Protein</b> 0 g	0%*
Not a significant source of saturated fat, cholesterol, fiber, calcium and iron	
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	



**Picture 2.18 Drink Water Nutrition Raw**

Getting enough water every day is important for health. Water can keep human’s body temperature normal, lubricate and cushion joints, protect human spinal cord and other sensitive tissues, get rid of wastes through urination, perspiration, and bowel movements.

2.5.4 Granulated Sugar

# Sugar

<b>Nutrition Facts</b>	
Serving Size 1 ounce (28g)	
Amount Per Serving	
Calories 108	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 28g	9%
Dietary Fiber 0g	0%
Sugars 28g	
Protein 0g	
Vitamin A 0%	Vitamin C 0%
Calcium 0%	Iron 0%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	
NutritionData.com	

**Picture 2.19 Granulated Sugar Nutrition Raw**

Sugar has a simple carbohydrate content that is easily converted into energy. Sugar is believed to increase energy in the body because of its carbohydrate content. Sugar is quite famous nutritious to add energy, antioxidants, healthy skin, etc (Meilisa, 2017).

## 2.6 Hazard Analysis and Critical Control Points (HACCP)

In our home industry, besides we talk about qualities of the product, we also pay attention about the making process. There are some critical points in making process, which are :

### 1. Fermentation of Kefir Grain

Make sure to pasteurize the fresh milk first. After the pasteurized milk reach at room temperature, put the kefir grain inside and let them do fermentation for 24 hours (1 night). If success, the smell from the fermentation product is like *tapai* and the sound we heard when we open the bottle are like when we open the soda bottle.

### 2. Filtering Process from the Blended Black Rice

Make sure to strain the waste of the black rice carefully. Because the blended black rice are really small, so it can be “free” from the strainer. Make sure to filter the blended product for 3-4 times.

### 3. Filtering after Anaerobic Fermentation Process

Separate the product with the kefir grain using strainer which are made from plastic, not stainless.