

CHAPTER II

LITERATURE REVIEW

2.1 Oats

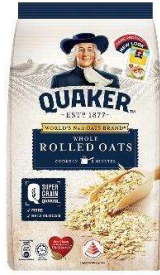


Figure 2.1 Quacker Oats Photos

There's solid evidence that whole grain oats and oat bran can help lower blood cholesterol thanks to the power of beta-glucan – a soluble fiber, largely unique to oats, that basically tells your liver to pull LDL cholesterol out of the blood. Then, it binds to some of the cholesterol in your gut, keeping it from ever reaching your bloodstream. Oats are included in the category of foods with high natural fiber content. It is proven that every 100 grams of oats contains 5-7.2 grams of soluble fiber and 9.9-14.9 grams of total fiber (soluble and insoluble fiber). Research that has been done shows that in oats there is amazing nutrition. Oats are rich in minerals needed by the body, such as magnesium, calcium, iron, phosphorus, potassium, folic acid and pantothenic acid. The peculiarity of oats is in one of its antioxidant contents. Oats also contain three other natural antioxidant components than other fibrous foods called avenanthramides. The three natural antioxidants include trichotrienol, ferulic acid, and caffeic acid which function to protect body cells from free radicals. Oats also contain auxin, a plant hormone that promotes growth, making them suitable for growing children. The silica content has a diuretic effect to shed fluids. The protein content in oats includes six types of essential

amino acids and oils. In oats there are also carbohydrates that are easily digested so that they can increase energy and strength.

2.2 Rice Flour



Figure 2.2 Rice Flour Photos

Rice flour has many unique characteristics, such as a bland taste, white colour, easy to digest, and is hypoallergenic (Shin et al., 2010). The role of resistant starch as fiber can also help lower blood cholesterol levels because propionate, a product of resistant starch fermentation, can inhibit the activity of the HMG-CoA reductase enzyme, which plays a role in the synthesis of cholesterol in the blood. Feeding mice with resistant starch can reduce total blood lipids to 269.39 mg/dL from 337.81 mg/dL in controls (Lee, et al., 2011).

2.3 Tapioca Starch



Figure 2.3 Tapioca Starch Photos

Tapioca is a starch that comes from the cassava plant (*Manihot esculenta*). It is used to thicken foods such as puddings, noodles, bread, and others. Tapioca starch

is prepared by cooking cassava, drying it, processing it, and then cooking it again. When eaten, tapioca takes longer for the body to break down into sugar when compared to other grains or carbohydrates. This might help lower blood sugar levels after eating. The minerals in tapioca can provide important health benefits. For example, calcium is important for keeping your bones strong and preventing the development of osteoporosis. Tapioca also contains iron, an essential mineral we need to help transport oxygen throughout the body.

2.4 Noodles

noodles are favored by many consumers because of their convenient preparation, unique taste and flavor, and affordable costs. With the development of the world economy and the increasing awareness of health and nutrition, consumers demand higher requirements for nutritional quality, texture, taste, and flavor of noodle products. Meanwhile, with the automation of noodle production, the noodle manufacturers require good and consistent processing properties of noodles. To meet these new demands, many functional ingredients have been adopted in noodle products for improved processing and eating qualities and the diverse functionality of noodles. These functional ingredients have contributed to the rapid growth of the modern noodle processing industry (Larisa Cato, Man Li, in Asian Noodle Manufacturing, 2020). Regarding the higher demand and interest in healthy food consumption I decided to make a gluten free noodle using oatmeal, tapioca starch, and rice flour as the ingredients. all the ingredients that used are super rich in nutrition, good for our health and 100% gluten free. The lack of desirable textural characteristics present in whole grain noodles has become a main hurdle in introducing this healthy version of the noodle to the mainstream marketplace. Whole grains contain bran and germ; the addition of bran not only results in rough surfaces and gritty mouthfeel, but also interrupts the development of the gluten network, leading to noodles of undesirable texture (Meng Niu, Gary G. Hou, in Asian Noodle Manufacturing, 2020) This noodle has a short shelf life because the main ingredient is easy to be spoiled. highly efficient preservation methods are required especially for

fresh noodles due to the issues of discoloration, fat oxidation, and spoilage caused by microorganisms (Meng Niu, Gary G. Hou, in Asian Noodle Manufacturing, 2020).

2.5 Gluten Free Noodle

Gluten is a protein found in certain grains, such as wheat, barley, rye, and a cross between wheat and rye called triticale. A gluten-free diet helps manage symptoms of celiac disease and other medical conditions associated with gluten consumption. This type of diet also has gained popularity among people without gluten-related medical conditions. The claimed benefits of the diet are improved health, weight loss and increased energy. (Kjersten Nett, R.D., L.D., 2020). The method that used in making this gluten free noodle are; grinding the oatmeal so it became oatmeal flour, mixing the ingredients (oatmeal flour, tapioca flour, rice flour and boiling water), kneading the dough until smooth, forming to a noodle shape and cooking the noodle in boiling water. This method is the same as making other noodle the different is in the ingredients that is used.