

CHAPTER II

LITERATURE REVIEW

2.1 Ingredients Review

2.1.1 Texturized Vegetable Protein

Textured vegetable proteins (TVP) can be defined as “texturates” made from plant-based protein sources and water by going through a transformation from a powder-type material to a structured material. A distinction is made between two product types: (I) low moisture TVP (LM-TVP) with a spongy structure and (II) high-moisture TVP (HM-TVP) with a fibrous structure like muscle meat. While the most common low-moisture texturization approach is extrusion, the most common high-moisture texturization approaches are extrusion and shear cell technology that enable the formation of anisotropic fibrous structures of single or blends of plant proteins. Through adjusting equipment and the structuring process parameters, textures, flavours, and shapes of TVP can be modulated to fit various vegan or hybrid products.

The development of plant-based meat is drawing considerable attention from scientific and industrial communities. In this frame, textured vegetable proteins (TVP) are gaining a momentum as key ingredients in meat alternatives. This review aims to provide practical information about the current landscape of TVP global market, production and uses with special focus on advances and challenges in formulating meat alternatives. Through mapping the market landscape, the main sources of TVP are soy, wheat, and pea proteins that are chiefly used in meat alternatives. TVP are available as low- (LM-TVP) and high-moisture (HM-TVP) extrudates/textures which are different in structure, form, storage, and functionality. Even though LM-TVP are the most used, the interest in HM-TVP are increasing due to their meat-like texture. The advances in texturization technologies and the rise of new protein sources are boosting the development of TVP with enhanced functionalities to

meet consumer expectations (in terms of flavour, texture, nutrition, and price), and thus expanding their use from mimicking animal products to optimizing new options that stand on their own merits. It is expected that the next generation of plant-based meat alternatives would go beyond imitation towards differentiation. (Syapri, Riyan Hartoyo, A., Suyatma, A., & Edi, N. (2020)).

2.1.2 Jackfruit

Jackfruit contains functional compounds that have capability to reduce various diseases such as high blood pressure, heart diseases, strokes, and bone loss. It is also capable of improving muscle and nerve function, reducing homocysteine levels in the blood.

Jackfruit is also rich in potassium which aids in lowering blood pressure and reversing the effects of sodium that causes a rise in blood pressure that affects the heart and blood vessels. This in turn prevents heart disease, strokes and bone loss and improves muscle and nerve function. Vitamin B6 present in jackfruit helps to reduce homocysteine levels in the blood, consequently lowering the risk of heart disease.

Jackfruit is also a good source of vitamin C, which protects the skin from the damage that occurs as a consequence of the natural aging process and prolonged exposure to sun. Vitamin C is also essential for the production of collagen, gives firmness and strength to the skin, and maintains oral health.

Some studies have also reported the anti-inflammatory effects of isolated bioactive compounds from the fruits of *Artocarpus heterophyllus*. Jackfruit contains flavonoids which are effective in inhibiting the release of inflammatory mediators from the mast cells, neutrophils, and macrophages. (Nurhayati, Asmawati, Ihromi, S., Marianah, & Supriyadi, A. (2020).)

2.1.3 Nugget

Nugget is a form of processed meat product made from ground meat which is molded into rectangular pieces and coated with seasoned flour. Nuggets are a form of ready-to-eat frozen food product, namely products that have been heated until half cooked, then frozen. This ready-to-eat frozen product only requires 1 minute of frying time at 150° C. Nuggets are a form of processed meat product that is popular throughout the world, made from ground meat that is molded or cut and coated with breadcrumbs then fried. The nuggets that are commonly known in the community are chicken nuggets. This research aims to find out: 1) What is the effect of adding chicken bones and Moringa leaves to chicken nuggets in terms of organoleptic properties (color, aroma, texture, elasticity and taste); 2) What is the best composition of chicken nuggets with the addition of chicken bones and Moringa leaves; 3) What is the level of children's liking for chicken nuggets with the addition of chicken bones and the best Moringa leaves; 4) What is the nutritional content (protein, fat, carbohydrates, calcium, phosphorus, fiber, vitamin A and vitamin C) of chicken nuggets with the addition of chicken bones and the best Moringa leaves. This type of research was experimental with 9 treatments consisting of 2 factors with 3 levels of addition, namely Moringa leaves 5%, 10%, 15% and chicken bones 4%, 5.25%, 6.5%. Data were collected using an observation sheet with a limited panel of 5 experts. The data analysis used was the Friedman test. To find the best treatment results, an effectiveness index test is used. The results of the products with the best treatment were tested for their level of preference by 30 children aged 4-6 years and chemically tested in the laboratory to determine the content of protein, fat, carbohydrates, calcium, phosphorus, fiber, vitamin A and vitamin C. The results of the research stated: 1) Addition of leaves Moringa and chicken bones affect color, aroma, texture and taste but do not affect the chewiness of chicken nuggets; 2) Based on the results of the effectiveness index test, the best product results were

obtained, namely by adding 10% Moringa leaves and 4% chicken bones; 3) The level of children's preference for the best chicken nugget products (adding 10% Moringa leaves and 4% chicken bones) reached 73%; 4) Chemical test of the nutritional content of the best chicken nuggets (addition of 10% Moringa leaves and 4% chicken bones) obtained 11.56% carbohydrates, 19.81% protein, 9.88% fat, 241.6 mg calcium, 128.5 mg phosphorus, 2.63% fiber, vitamin A 86.55 mcg and vitamin C 26.52 mg. Keywords: Chicken nuggets, Moringa leaves, chicken bones.(*Balqis, A. M., & Nugrahani, A. (2019)*).

Nuggets are also a very popular food in Indonesia, from small children to adults, everyone really likes nuggets, nuggets are usually enjoyed as an accompaniment to rice, nuggets are also a food that is very suitable to be eaten in any situation, because they are considered practical, nuggets are usually also enjoyed in picnic events, because making nuggets is very easy and easy, many people are making new innovations by changing the protein in the nuggets and also making healthier innovations, for example vegan firendly, gluten free and many more (*Arif Rokhayati, U. (2023)*) .