

CHAPTER II

LITERATURE REVIEW

2.1 Ingredients Review

2.1.1 White Beans

Phaseolus vulgaris L., sometimes known as white beans, which is native to South American nations like Mexico and Argentina. South America is the world's greatest consumer, eating over 23 million tons in 2012 (Heredia-Rodriguez *et al.*, in Nasution, 2019). To survive on the chilly, humid plateau, it has been tamed and raised on farms.

White kidney beans are now widely planted throughout China, with Yunan, Guizhou, and Sichuan having the largest cultivation areas. White kidney beans have gained attention as a nutraceutical in recent years due to their abundance of bioactive components such as polyphenols, resistant starch, oligosaccharides, and bioactive peptides (Heredia-Rodriguez *et al.*, in Nasution, 2019).

He (in Nasution, 2019) explain *Phaseolus vulgaris* beans are a valuable food element for more than half a billion people because they are high in proteins (22%–27% of seed weight) and carbs (39%–47% of seed weight). Therefore, 100 g of dry common beans supply around 20% protein of the daily allowance for an average adult. As a result, the protein in beans meets the minimum standards for human consumption recommended by the Food and Agriculture Organization and the World Health Organization.

According to Pagara (in Nasution, 2019) White beans are among the

many varieties of beans that are popular in Indonesia. White beans, also known as cowpea, have many benefits, including being simple to grow, being less expensive than soybeans, and having a high protein content. In addition to soybeans, white beans are a source of vegetable protein in Indonesia that can be used to meet dietary demands.

According to Refwallu and Sahertian (2020) the white bean is a vine. Green stem with many branches. The three green leaves each measure 10–13 cm in length and 7–10 cm in width. The leaves' surfaces are lustrous, their edges are flat, and their tips are tapered. bloom with a butterfly form. 10–20 cm long and 1–1.5 cm broad pods. fruit tip with a point. When they are ready for harvest, the pods are brown. There are 20 seeds in each of the pods. The white seeds are lustrous, have a smooth, black surface, and are often square in shape, however some are circular.

2.1.2 Carrots

The Umbelliferae family, which originated in Central Asia and then spread over the world, includes the carrot (*Daucus carota*). In subtropical or tropical highlands, this plant is commonly cultivated. 2015 (Subhan *et al.*, in Subagianatar, 2022). Annual grass-like plants were among the carrot plants. Inwardly pinnate leaves are present. The interest is presented as compound interest in the form of white umbrellas with a dark brown centre. (Handz *et al.*, in Subagianatar, 2022).

Water, protein, carbs, fat, and vitamins (beta carotene, B1, and C) are all present in fresh carrots. As an antioxidant, beta carotene helps the body's health and slows down the ageing process. Beta-carotene can stop and slow the formation of cancerous cells and shield polyunsaturated fatty acids from the oxidation process.

Antioxidants found in beta-carotene, which is abundant in carrots,

helpful against cancer-causing free radicals. Man's risk of developing prostate cancer can be lowered by carrots. Regular carrot consumption can lessen free radicals' ability to cause cancer. Avoid consuming too much because doing so can colour your skin yellow. In addition to being eaten raw, carrots can also be cooked before being eaten. One meal that might help the body detoxify and balance out imbalances is carrots. The precursor to vitamin A, beta-carotene, is abundant in vegetables. (Subagiantari, 2022).

2.2 Product Review

2.2.1 Nugget

One of the prepared meal items that has already become ingrained in people's daily life is nugget. One of the numerous ready-to-eat products that consumers choose that are both useful and nutritious for the body are nuggets. To preserve their quality throughout storage and distribution, nuggets are made from meat products or modified ingredients that have been seasoned, combined with other ingredients to bind the dough, sprinkled with bread flour, and then frozen. (Singh & Thakur, in at., syadiah-riska-adelina, 2022). Usually, nuggets are made from mixed ground meat. White beans are used to replace protein in nuggets where chicken nuggets are usually used.

2.3 Process Review

2.3.1 Frying

Method that used to process this product is pan frying, and chop the beans, carrot, and cauliflower and the mix with the flour. Frying is a technique that is widely used in industry and households, so this is a good technique for making nuggets.

The taste of frying involves the smell of burnt, fatty and smooky smells which are important factors and make this technique used by many people. At temperatures higher than 80 °C, protein can be reduced. Vitamin retention in this range is significantly more influenced by internal temperature than by frying oil temperature (Dana & Saguy, 2006). At a temperature of 180°C, the deep technique for frying produces the highest quantities of dissolved protein, which is 1.05%.

Using pan frying in low temperature prevents a lot of vitamins from being wasted, so it is recommended to cook the product over low heat. Because the protein content is lowered less, using method at 120°C is more advised, it is 0,80%.. (Rabiatul Adawiyah, 2016).