

CHAPTER I

INTRODUCTION

1.1 Background of The Study

Lifestyles can vary greatly, encompassing aspects such as clothing, food, activities, and more. One lifestyle currently gaining attention is a healthy lifestyle, which involves consuming nutritious and beneficial foods. The shift towards healthy eating has spurred the creation of new food products that are delicious, high in fiber, protein, vitamins, and other nutrients in a complex, convenient, and affordable form. One such food that meets these criteria is snack bar. Snack bars are very popular among people worldwide and are often preferred for their health benefits. They are an excellent choice for breakfast or as a post-workout snack (Ibrahim et al., 2021). Snack bars consist of nuts, grains, and both soluble and insoluble dietary fibers, making them adaptable to rational diets as sources of carbohydrates, micronutrients, and macronutrients.

In the market, snack bars and other cereal-based foods are often sold with added fruits and vegetables. However, these snacks often still contain high amounts of sugar, fat, and other ingredients. This is due to the combination of cereals, grains, and various fibers as sources of carbohydrates, fats, and proteins, among other ingredients, which determines the health benefits of these products (Kowalska et al., 2023). In other words, the different compositions of each ingredient alter the nutritional matrix, creating conditions for changes in the nutritional, microbiological, textural, and sensory parameters of the product (Ibrahim et al., 2021). One grain with the potential to become a primary ingredient in snack bars is sorghum. Sorghum (*Sorghum bicolor* L.) is a self-pollinating plant with high photosynthetic efficiency. Sorghum is a drought-resistant cereal cultivated in dry and semi-arid regions such as sub-Saharan Africa, Asia, the Middle East, Central and North America, and Australia. This cereal can also withstand cold weather at 12-15°C, waterlogged conditions, and can grow in areas with high rainfall (Khoddami et al., 2023).

In Indonesia, sorghum productivity is relatively low, therefore, much research is needed regarding its development (Hanafiah et al., 2023) while in Africa and Asia, whole sorghum seeds, decorticated grains, and sorghum flour are used to make various foods. These include thick porridge, fermented or unfermented, boiled products similar to those made from cornmeal or rice, flatbread, and various fried food, among others (Khoddami et al., 2023). According to a research journal by Teferra et al., (2019), sorghum has beneficial properties, such as easily digestible starch, unique bioactive flavonoids, and activity against inflammation, oxidative stress, and cardiovascular diseases, making it a highly potential food source. Additionally, sorghum is known to contain "good" carbohydrates due to its higher proportion of resistant starch (RS) and slowly digestible starch (SDS) components. These carbohydrate components can help consumers feel full longer, thereby reducing the frequency of snacking, which indirectly contributes to a lower glycemic index and a reduced risk of type 2 diabetes and overweight. Sorghum also contains relatively high levels of phytochemicals beneficial to health, including phenolic compounds, phytosterols, and policosanol. The dominant phytochemicals in sorghum play an important role as antioxidants, anti-inflammatory agents, and potentially have other health-enhancing effects. From an economic perspective, sorghum generally has lower production costs compared to other cereal crops like corn. This is evident in the costs of seeds, fertilizers, land rent, pesticides, etc. (Teferra et al., 2019). Thus, the net income obtained is higher, and its selling price is more affordable. These various health and economic benefits drive the development of sorghum-based snack bars.

In addition to the main ingredient, snack bars require binding and complementary ingredients to become a complete and nutritious product. The binder commonly used in snack bars is granulated sugar derived from sugarcane. However, the high sugar content in sugarcane is not healthy for consumers. Therefore, an alternative that can be used to make snack bars is sorghum syrup. As it is commonly understood, sorghum is a cereal plant with many benefits. According to Rajeswari et al., (2023), sorghum utilization can

be divided into four main groups. The first group is grain sorghum, which serves as an alternative food source in Indonesia and tropical regions. The second group is sweet sorghum, used in the production of ethanol, alcoholic beverages, animal feed, and syrup. The third group consists of broomcorn used in the manufacture of brooms or brushes. Finally, the fourth group is forage sorghum used as livestock feed. Therefore, in addition to using sorghum grains as the main ingredient, sorghum syrup can also be used as a binder in snack bars. Sweet sorghum syrup contains lower sugar levels compared to sugarcane sugar. This was evidenced in a study by Asikin et al., (2017), where the total sugar content of sugarcane was higher at 80.52 grams compared to sweet sorghum at 68.57 grams. Moreover, sweet sorghum syrup also contains significantly higher total phenolic content compared to sugarcane syrup (Asikin et al., 2017). Phenolic compounds are known for their antioxidant activity, which can help prevent the risk of diseases, making them highly beneficial for consumer health.

Sorghum snack bar itself unites all components into a product through 3 processes, the first is pop-sorghum process, this process serves to make the texture of sorghum more crunchy and crispy. The second process is the caramelization process, this process functions to make the sorghum snack bar more durable. The third process is the date drying process, its function is to reduce the water content of the dates so that the sorghum snack bar is more durable. Additionally, complementary ingredients such as dried dates, raisins, and chia seeds can increase the energy value of the snack bar itself. All components included in the snack bar have been considered for their nutritional value and health benefits. Therefore, this product will be highly sought after amid the health-conscious lifestyle of the public.

1.2 The Objectives of The Study

1. To produce a healthy and practical snack bar product by utilizing sorghum and sorghum sugar, which are rarely processed into snack bar product.
2. To determine the nutritional content of the sorghum snack bar product.