CHAPTER I

INTRODUCTION

1.1 Research Background

Indonesia is an archipelagic country that is prone to natural disasters.[1] Indonesia is located on the Ring of Fire, which makes it highly susceptible to natural disasters.[2] Indonesia's disasters have been increasing year by year. According to data from the National Disaster Management Agency (NDMA), over the past four years (2018–2022), Indonesia has experienced 12,254 disaster events.[3] Various disasters such as floods, tsunamis, earthquakes, and volcanic eruptions frequently occur and often harm the environment and local communities, leading to food insecurity.[4]

The data on food insecurity in the moderate to severe category caused by disasters in 2022 showed a rate of 4.85%. The inability to consume nutritious food during a catastrophe could lead to food insecurity.[5] The purpose of providing emergency food was to address food insecurity caused by natural disasters. Emergency food had to specific characteristics, including being safe, ready for consumption, and nutritionally complete.[6] Emergency food *snack bars* were designed to meet the daily energy requirement standard of 2,100 kcal, with 10-15% protein, 35-45% fat, and 40-50% carbohydrates as emergency food. One type of emergency food that could be developed is a *snack bar*.[7]

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[1] Agung Nugroho, 'Pengembangan Model Pembelajaran Mitigasi Bencana Gunung Meletus Di Sekolah Dasar Lereng Gunung Slamet', *Jurnal Pengabdian Masyarakat Multidisiplin*, 1.2 (2018), pp. 131–37, doi:10.36341/jpm.v1i2.413.

[2] Rahayu. 2022. Formulasi Pangan Darurat Dari Bipang Beras Merah (Oryza Glaberrima) Dengan Penambahan Kacang Hijau Tanpa Kulit (Phaseolus Radiata) Dan Kacang Tanah (Arachis Hypogaea (L.) Merr.). Fakultas Pertanian. Universitas Hasanuddin. Makassar.

[3] Badan Nasional Penanggulangan Bencana (2022) *Geoportal Data Bencana Indonesia*. Available at: https://gis.bnpb.go.id/.

[4] Ngaisyah, et al. 2023. *Pengembangan Food Bar Pisang Nangka (Musa acuminata) dan Tepung Mocaf sebagai Pangan Darurat untuk Memenuhi Kebutuhan Gizi Masyarakat Terdampak Bencana*. Medika Respati : Jurnal Ilmiah Kesehatan Vol. 18 No. 3.

[5] Sari, M., et al. 2023. Kesehatan lingkungan Bencana. Get Press Indonesia. Kota Padang Sumatra Barat.

[6] IOM UN Migration. Diakses melalui https://indonesia.iom.int/id pada 2022.

[7] Fauziyyah & hakiki. 2021. Potensi Snack Bar Bligo Sebagai Produk Pangan Darurat. J. Gipas, Mei 2021, Volume 5 Nomor 1.

The development of *snack bars* as emergency food was driven by their ease of consumption, high energy content, bar-shaped form, and low moisture content (dry), which makes them suitable for long-term storage.[8] Emergency food in *snack bars* could help meet nutritional needs by providing energy, protein, fat, carbohydrates, and fiber.[9] One alternative for *snack bar* development was local food ingredients, such as Kepok banana flour and mackerel fish flour.[10]

The nutritional content of kepok banana flour per 100 grams was energy 338 kcal, protein 2.9 g, fat 0.4 g, carbohydrates 80.6 g, fiber 5.3 g.[11] Research conducted by Khadijah (2021) found that the nutritional advantage of kepok banana flour lies in its high carbohydrate and fiber content, with carbohydrates at 84.48% and fiber at 2.86%.[12] According to research by Linangsari et al. (2022), organoleptic test results showed that *snack bars* made with Kepok banana flour received a positive response, indicating that panelists highly favored the resulting snack bar's taste, color, aroma, and texture.[13] Meanwhile, research by Niau (2024) found that the addition of mackerel fish flour in the hedonic organoleptic test decreased panelists' preference for color, aroma, and taste, except for the texture aspect, which remained favorable.[14]

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[8] Fitria, M,. 2022. Snack Bars Kacang Tanah Dan Tepung Ubi Jalar Sebagai Pangan Darurat. Jurnal Riset Kesehatan Poltekkes Depkes Bandung Vol 14 No 1.

[9] Syahrina Maulida Majid and Eko Farida, 'Formulasi Snack Bar Berbahan Dasar Tepung Kedelai (Glycine Max L.) Dan Tepung Labu Kuning (Cucurbita Moschata Durch) Sebagai Makanan Alternatif Sumber Energi', *Indonesian Journal of Public Health and Nutrition*, 4.2 (2022), pp. 217–24.

[10] Aris Susanto and others, 'Food Bar Berbasis Tepung Pisang Dan Mocaf Sebagai Emergency Food', *Journal of Food Security and Agroindustry*, 1.2 (2023), pp. 24–31, doi:10.58184/jfsa.v1i2.65.

[11] Kementerian Kesehatan RI. Data KomposisiPangan Indonesia (Online). Jakarta: KemenkesRI. 2019.

[12] S Khodijah, Indiryani, and Mursyid, 'Pengaruh Perbandingan Tepung Terigu Dengan Tepung Pisang Kepok (Musa Paradisiaca Linn) Terhadap Sifat Fisikokimia Dan Sifat Organoleptik Fetucini', *Jurnal Repository Universitas Jambi*, 2021, pp. 1–10.

[13] Titis Linangsari and others, 'Evaluasi Sensori Snack Bar Talipuk Dengan Penambahan Tepung Pisang Kepok (Musa Paradisiaca Forma Typica) Pada Panelis Anak-Anak Dan Dewasa', *Jurnal Agroindustri Halal*, 8.2 (2022), pp. 213–21, doi:10.30997/jah.v8i2.6560.

[14] Husnul Khatimah Ishak, Asri Silvana Naiu, and Lukman Mile, 'Pengaruh Substitusi Tepung Ikan Kembung (Rastrelliger Kanagurta) Pada Tepung Labu Kuning (Cucurbita Moschata) Terhadap Karakteristik Kue Semprit The Impact of Substituting Indian Mackerel Fish (Rastrelliger Kanagurta) Flour Fish with for Yellow Pump', 1.Sinta 3 (2024), pp. 135–44.

Snack bars ware formulated using mackerel fish flour, which is rich in protein and other nutrients. The nutritional content of mackerel fish per 100 grams was energy: 125 kcal, protein: 21.3 g, fat 3.4 g, carbohydrates 2.2 g.[15] Research by Sutianto et al. (2023) reported that the nutritional advantage of mackerel fish flour lies in its high protein content, reaching 53.71%.[16] According to research by Munira (2023), adding mackerel fish flour significantly increased the protein content in biscuits. The protein analysis results showed that biscuits without mackerel fish flour experienced a decrease in protein levels due to the absence of fortification with mackerel fish flour.

Every Muslim is obligated to maintain their health by fulfilling their nutritional needs. As stated in the Qur'an, the types of food that should be consumed are permissible and beneficial, ensuring a sustainable and healthy life in the future.

" *Hai you who have believed, eat from the good things which We have provided for you and be grateful to Allah if it is [indeed] Him that you worship*." (Qur'an Surah Al-Baqarah: 172).[17]

In Surah Al-Baqarah verse 172, as interpreted by Ibnu Katsir, Allah commands His believing servants to consume good and lawful food from the sustenance He has provided and to always be grateful for it if they truly worship Him. Eating halal food is one of the key factors in having prayers accepted and worship recognized. This emphasizes the importance of consuming pure and wholesome food, highlighting the responsibility of Muslims to maintain a healthy diet by Islamic teachings.[18]

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[15] Kementerian Kesehatan RI. Data KomposisiPangan Indonesia (Online). Jakarta: KemenkesRI. 2019

[16] Munira Munira, Rahim Husain, and Sutianto Pratama Suherman, 'Karakteristik Biskuit Yang Disubstitusi Tepung Ikan Kembung (Rastrelliger Brachysoma) Sebagai Pemberian Makanan Tambahan Anak Sekolah (PMT-AS)', *Cakrawala Repositori IMWI*, 6.2 (2023), pp. 1143–55, doi:10.52851/cakrawala.v6i2.313.

[17] Ardinato, Farhan,. M. L. (2022). *Makanan dan Gizi dalam Pendidikan Islam.* Karya Ilmiah Inovasi dan Kreativitas. Hal. 29

[18] Nurul Fajri Putri Selviana, 'Tela ' Ah Metode Tafsir Ibnu Katsir Dalam Surat Al-Baqarah Ayat 172', 5.2 (2024).

Based on this background, research on the development of emergency food is necessary, particularly in the form of a *snack bar* made from Kepok banana flour substituted with mackerel fish flour. This product utilizes local ingredients and offers high nutritional value. Snack bars are lightweight, convenient snacks commonly consumed as snacks and are especially suitable for emergency situations.

1.2 Research Background

The research problem formulation for this study includes:

1. Is there a difference in the protein, carbohydrate, and dietary fiber content in the formulation of *snack bars* made from Kepok banana flour substituted with mackerel fish flour as emergency food?
2. Is there differences in the Sensory Acceptability test results among the formulations of *snack bars* made from Kepok banana flour substituted with mackerel fish flour as emergency food?
3. Which formulation produces the best *snack bar* made from Kepok banana flour substituted with mackerel fish flour?

1.3 Research Objectives

1. General Purpose

The general purose of this study is to analyze the differences in protein, carbohydrate, and dietary fiber content in Kepok banana flour substituted with mackerel fish flour and to assess its acceptability as an emergency food.

2. Special Purpose

The specific objectives of this study are:

a. To analyze the differences in protein content among formulations of *snack bars* made from Kepok banana flour substituted with mackerel fish flour as emergency food.

b. To analyze the differences in carbohydrate content among formulations of *snack bars* made from Kepok banana flour substituted with mackerel fish flour as emergency food.

c. To analyze the differences in dietary fiber content among formulations of *snack bars* made from Kepok banana flour substituted with mackerel fish flour as emergency food.
d. To analyze the differences in sensory acceptability test results among formulations of *snack bars* made from Kepok banana flour substituted with mackerel fish flour as emergency food.
e. To determine the best formulation for *snack bars* made from Kepok banana flour substituted with mackerel fish flour.

1.4 Research Benefits

1. **Theoretical Benefits**

   This research is expected to provide valuable information on emergency food, which can be utilized by nutrition study programs to help maintain and sustain normal nutritional status during disasters.

2. **Practical Benefits**

   Developing a high-protein, carbohydrate, and dietary fiber *snack bar* made from Kepok banana flour and mackerel fish flour as an alternative emergency food option.

1.5 Authenticity Research

Table 1. Originality of the Research

Research Title	Types of Research	Variable	Results	Research Differences
The Food Bar was made from Timor Island's local beans and used as emergency food.[19]	Eksperimen laboratoris	Independent: The Food Bar made from local beans of Timor Island was used as emergency food Dependent: Analysis of energy content and organoleptic testing	Formulation 3 was preferred the most, with the highest score of 3.71 (± 0.750), while formulations 1 and 2 had scores of 3.37 and 3.29, respectively	Variable independent: The snack bar is made from kepok banana flour and mackerel fish flour Variable Dependent: Analysis of protein, carbohydrate, and fiber content
The development of the Nangka Banana (Musa acuminata) Food Bar and Mocaf flour as emergency food to meet the nutritional needs of disaster-affected communities was carried out.[20]	Eksperimental	Independent: Nangka Banana Food Bar and Mocaf flour Dependent: Organoleptic testing, including taste, color, aroma, and texture, was conducted.	There was a significant difference of 0.013 and 0.003 in substituting nangka banana in producing mocaf flour food bars on the organoleptic properties.	Variable Independent: The snack bar is made from kepok banana flour and mackerel fish flour Variabel Dependen: Analysis of protein content, carbohydrate content, and fiber content was conducted

[19] Puspita, et al., 2021. *Formulasi Food Bar dari Kacang Lokal Pulau Timor Sebagai Pangan Darurat*. Universitas Kristen Satya Wacana, Salatiga.

[20] Ngaisyah, et al. 2023. *Pengembangan Food Bar Pisang Nangka (Musa acuminata) dan Tepung Mocaf sebagai Pangan Darurat untuk Memenuhi Kebutuhan Gizi Masyarakat Terdampak Bencana*. Medika Respati : Jurnal Ilmiah Kesehatan Vol. 18 No. 3.

Research Title	Types of Research	Variable	Results	Research Differences
The potential of Bligo Snack Bar as an emergency food product was explored.[21]	Experimental	Independent: The potential of Bligo Snack Bar as emergency food Dependent: Moisture content, ash content, fat content, carbohydrate content, and protein content were tested. Physical tests measuring cohesiveness and hardness values	The nutritional values were 43.21% carbohydrates, 16.64% fat, 13.65% protein, 5.50% moisture, and 20.99% ash.	Variable independent: The snack bar is made from kepok banana flour and mackerel fish flour Variable Dependent: Analysis of protein content, carbohydrate content, fiber content, and organoleptic testing were conducted.
Peanut and sweet potato flour snack bars as emergency food were developed.[22]	Experimental	Independent: Peanut and sweet potato flour snack bar as emergency food was developed Dependent: Hedonic test, proximate analysis, and shelf life analysis using the ASLT method	Each serving of Snack Bar F1 (50 grams) contained 238.47 kcal of energy, 7.5 g of protein, 12.98 g of fat, and 22.91 g of carbohydrates.	Variable Independent: The snack bar is made from kepok banana flour and mackerel fish flour Variable Dependent: Analysis of protein content, carbohydrate content, fiber content, and organoleptic testing were conducted.

[21] Fauziyyah & hakiki. 2021. *Potensi Snack Bar Bligo Sebagai Produk Pangan Darurat*. J. Gipas, Mei 2021, Volume 5 Nomor 1.
[22] Fitria, et al. 2022. *Snack Bers Kacang Tanah Dan Tepung Ubi Jalar Sebagai Pangan Darurat*. Jurnal Riset Kesehatan Poltekkes Depkes Bandung Vol 14 No 1 Mei 2022.

Research Title	Types of Research	Variable	Results	Research Differences
The formulation of a high-nutrient cookie food bar made from moringa leaf flour and spirulina as emergency food for disaster victims was developed as food chemistry teaching material.[23]	True experiment	Independent: Moringa leaf flour and spirulina cookies food bar for disaster victims was developed as emergency food. Dependent: Analysis of moisture content, ash content, protein, fat, energy, sodium, potassium, calcium, iron, carbohydrate content, vitamin A, C, E levels, and organoleptic quality were conducted.	Product E containing spirulina had a ratio of 10:90, an average score of 3.53 for color, taste, aroma, and texture, and a range of 1-5.	Variable Independent: The snack bar is made from kepok banana flour and mackerel fish flour Variable Dependent: Analysis of protein content, carbohydrate content, and fiber content was conducted.

[23] Azhari & Hergiani. 2023. *Formulasi Cookies Food Bar Bergizi Tinggi Berbahan Tepung Daun Kelor Dan Spirulina Pangan Darurat Korban Bencana Alam Sebagai Bahan Ajar Kimia Pangan.* Research and Practice of Educational Chemistry Tadris Kimia, IAIN Syekh Nurjati Cirebon.