



## Development of Purple Yam-based (*Dioscorea Alata*) ready-to-eat food for emergency preparedness

Juvyra O. Peco, LPT\*<sup>1</sup>, Janette Manatad-Casuco, LPT, MAEd<sup>2</sup>

<sup>1, 2</sup> Samar State University, Catbalogan City, Philippines

\*Corresponding Author e-mail: [juvyraoreopeco0926@gmail.com](mailto:juvyraoreopeco0926@gmail.com)

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### Abstract

**Aim:** This study aimed to develop and evaluate a ready-to-eat (RTE) cereal bar formulated from purple yam (*Dioscorea alata*) as a potential shelf-stable food product for emergency preparedness and disaster response.

**Methodology:** A developmental–descriptive research design was employed. Purple yam tubers were processed into flakes and combined with locally available cereals, nuts, and binding ingredients to formulate three cereal bar treatments. The products were molded, baked, cooled, and packaged in moisture-resistant materials. Sensory evaluation was conducted using a 9-point hedonic scale with thirty panelists to assess the product's acceptability in terms of taste, aroma, color, texture, and appearance. Descriptive statistics, including weighted mean and ranking, were used to analyze the sensory evaluation results.

**Results:** The results revealed that all developed formulations obtained high levels of sensory acceptability, with mean scores interpreted as "Like Very Much" to "Like Extremely" across all evaluated attributes. Among the treatments, the formulation with balanced proportions of purple yam and complementary ingredients achieved the highest overall acceptability, indicating favorable sensory quality and product potential.

**Conclusion:** The findings demonstrate that purple yam (*Dioscorea alata*) can be effectively utilized in the development of a culturally acceptable, locally sourced, and nutritionally supportive ready-to-eat cereal bar suitable for emergency food applications. The developed product has the potential to support disaster preparedness initiatives and strengthen community-based food security through the value addition of indigenous crops.

**Keywords:** purple yam, *Dioscorea alata*, ready-to-eat cereal bar, emergency food, disaster preparedness, food security

### INTRODUCTION

Food security and disaster preparedness have become major global concerns in recent years because of the increasing frequency and intensity of climate-related hazards, environmental degradation, and public health emergencies. These conditions have disrupted food supply systems and heightened the vulnerability of affected populations, particularly in developing countries (Food and Agriculture Organization of the United Nations [FAO], 2023). According to FAO (2023), climate-related disasters continue to intensify global food insecurity by disrupting agricultural production, reducing food accessibility, and increasing nutritional vulnerability in high-risk regions. Consequently, there has been increasing emphasis on developing safe, nutritious, portable, and shelf-stable food products that can support emergency response and long-term recovery.

Globally, ready-to-eat (RTE) foods have gained importance in disaster and humanitarian settings because they require minimal preparation, limited water, and no cooking facilities (Kaur & Kapoor, 2021). Among these products, cereal bars have emerged as practical emergency foods because of their compact size, ease of distribution, portion control, and extended shelf life. Recent studies have shown that cereal bars formulated with plant-based ingredients can maintain desirable sensory quality and storage stability, making them suitable for emergency nutrition applications (Sommo et al., 2024).

In the Philippine context, disaster preparedness remains a critical priority because of the country's geographical location along the Pacific typhoon belt and the Pacific Ring of Fire. The Philippine Atmospheric,



Geophysical and Astronomical Services Administration (PAGASA, 2023) reported increasing climatic variability and recurrent typhoons that continue to affect food systems and local resource distribution. During disasters, affected communities often rely on relief goods composed mainly of rice, canned foods, and instant noodles, which provide immediate calories but often lack dietary diversity and micronutrient adequacy.

The use of indigenous crops for emergency food development has therefore gained relevance as part of strengthening local food systems. Purple yam (*Dioscorea alata*), locally known as ube, is one of the most widely consumed root crops in Filipino households and remains adaptable to diverse soil and climatic conditions. It is widely available in rural communities, including Samar, and contains carbohydrates, dietary fiber, vitamins, anthocyanins, and phenolic compounds with antioxidant properties (Adoméniené & Venskutonis, 2022; Lebot et al., 2023; Pérez-Ramírez et al., 2022).

Despite the abundance of purple yam (*Dioscorea alata*) in the Philippines, limited research has explored its utilization in shelf-stable ready-to-eat cereal bar formulations specifically intended for emergency preparedness and disaster response. Most existing studies involving purple yam focus on desserts, confectionery products, and general snack foods, with limited investigation into its development as a shelf-stable cereal bar specifically intended for emergency food systems. Existing literature also provides limited evidence on integrating indigenous crop utilization, emergency-oriented product design, and sensory acceptability within a single disaster nutrition framework (Sommo et al., 2024).

Additionally, despite its nutritional potential, emergency food packs often prioritize caloric provision over nutritional quality and cultural familiarity. Fresh purple yam is also highly perishable and bulky, limiting its storage and transport potential. Processing methods such as dehydration and cereal bar formulation provide practical options for improving shelf life and suitability for emergency stockpiling (Chaudhary et al., 2021).

To address this gap, the present study focused on the development and evaluation of a purple yam-based ready-to-eat cereal bar for emergency preparedness and disaster response. By integrating indigenous crop utilization, food processing innovation, and sensory acceptability assessment, the study aimed to develop a culturally acceptable, nutritionally supportive, and locally sourced emergency food product that may contribute to food security and disaster resilience in the Philippines.

## Review of Related Literature and Studies

This section reviews recent and relevant literature related to the development of a purple yam (*Dioscorea alata*)-based ready-to-eat (RTE) cereal bar for disaster preparedness and emergency response. It examines indigenous crops in food security, cereal bars as emergency foods, nutritional and functional properties of purple yam, processing methods for shelf-stable products, sensory acceptability, and local emergency food systems.

Indigenous crops are increasingly recognized as important resources for strengthening local food systems, particularly during disruptions in food supply caused by disasters and environmental changes. The Food and Agriculture Organization of the United Nations emphasized that locally available crops improve food security because they remain accessible when commercial food distribution is interrupted (Food and Agriculture Organization, 2020). In the Philippines, purple yam (*Dioscorea alata*) remains widely cultivated and consumed because of its adaptability, availability, and cultural familiarity. Lebot et al. (2023) noted that purple yam is a practical carbohydrate-rich crop that can support local food resilience and value-added food development.

Ready-to-eat foods are essential in emergency situations because they provide immediate nourishment without requiring cooking or extensive preparation. Kaur and Kapoor (2021) explained that such products are valuable during disasters when access to fuel, water, and cooking facilities is limited. Among ready-to-eat products, cereal bars are considered highly practical because of their compact size, low moisture content, and long shelf life. Sommo et al. (2024) reported that cereal bars formulated from plant-based ingredients can maintain desirable nutritional and physical properties, making them suitable for emergency food applications.

Purple yam contains important bioactive compounds that contribute to both nutritional and functional value. Adoméniené & Venskutonis (2022) reported that *Dioscorea* species contain carbohydrates, dietary fiber, vitamins, and phenolic compounds that enhance food quality. Its purple pigmentation is associated with anthocyanins, which are known antioxidants. Pérez-Ramírez et al. (2022) explained that anthocyanins contribute to antioxidant defense and also improve the visual appeal of food products, making purple yam attractive for cereal bar development.

Processing methods strongly influence the quality and storage stability of root crop-based foods. Chaudhary et al. (2021) noted that dehydration reduces moisture content and helps extend shelf life, while baking improves texture and structural integrity. These processes are important in cereal bar production because they improve product firmness, reduce spoilage risk, and support practical storage for emergency use.



Sensory acceptability remains essential in food product development because consumers evaluate products primarily through taste, aroma, color, texture, and appearance. Lawless and Heymann (2010) emphasized that sensory evaluation is a reliable method for determining whether a new food product is acceptable for consumption. For emergency foods, high sensory acceptability is important because products must be willingly consumed under stressful conditions.

Although purple yam has been widely studied for nutritional value, limited research has focused on its formulation as a shelf-stable cereal bar specifically intended for emergency food application. This gap supports the need for the present study, which integrates indigenous crop utilization, food processing, and sensory evaluation for disaster preparedness.

## Theoretical Framework

The theoretical framework of this study was grounded in key concepts of food security, disaster nutrition, and innovation adoption. Specifically, the study was guided by Diffusion of Innovations, the Food Security Framework of the Food and Agriculture Organization, and Abraham Maslow's hierarchy of needs theory.

Rogers' Diffusion of Innovations Theory explains how new products and technologies are adopted within social systems over time, with adoption influenced by relative advantage, compatibility, simplicity, trialability, and observability (Rogers, 2003). In this study, these principles explain how a purple yam-based cereal bar may be accepted by local communities and institutions involved in disaster preparedness. The indigenous nature of purple yam improves compatibility, while the ready-to-eat form enhances practical advantage during emergencies.

The Food Security Framework emphasizes four dimensions of food security: availability, accessibility, utilization, and stability (Food and Agriculture Organization, 2020). These dimensions guided the formulation of the cereal bar using locally available ingredients and ensured relevance to emergency food systems where immediate access to safe and nutritious food is critical (Food and Agriculture Organization, 2020).

Maslow's hierarchy of needs explains that physiological needs such as food must be satisfied before higher human needs can be addressed (Maslow, 1943). In disaster situations, food becomes an immediate survival priority because displacement and infrastructure disruption reduce access to basic resources. A ready-to-eat cereal bar therefore directly addresses immediate nutritional needs during emergency conditions.

The integration of these frameworks explains both the technical development of the product and its practical acceptance in disaster preparedness settings.

## Conceptual Framework

The conceptual framework of this study illustrates the systematic relationship among the variables involved in developing and evaluating a purple yam (*Dioscorea alata*)-based ready-to-eat cereal bar for emergency preparedness. The study adopted an Input-Process-Output (IPO) model to demonstrate how resources and activities were transformed into measurable outcomes.

The input component consisted of the primary raw material, purple yam (*Dioscorea alata*), selected for its nutritional value, cultural familiarity, and local availability in Samar Province. Additional locally sourced and cost-effective ingredients, including cereals, nuts, seeds, and binding agents, were incorporated to enhance texture, flavor, and nutritional quality. Human resources, laboratory equipment, and validated sensory instruments were also included as inputs.

The process component involved standardized food processing and evaluation procedures. These included ingredient preparation, mixing, molding, baking, cooling, and packaging to produce a compact and shelf-stable cereal bar. Sensory evaluation was conducted using a validated 9-point hedonic scale to assess taste, aroma, color, texture, and appearance. Data collection, statistical analysis, and interpretation were also part of the process phase to ensure systematic product assessment.

The output of the study was a formulated purple yam-based ready-to-eat cereal bar that met acceptable sensory standards and demonstrated potential for emergency food application. The results provided empirical evidence on product acceptability and practical feasibility. The output also included recommendations for product improvement and future development.

Overall, the conceptual framework served as a guide that connected indigenous agricultural resources, food processing techniques, and consumer evaluation outcomes. It illustrated how locally available inputs were transformed through systematic processes into an acceptable and sustainable emergency food product. This

framework supported the study's goal of contributing to disaster preparedness, food security, and community resilience in the Philippines.

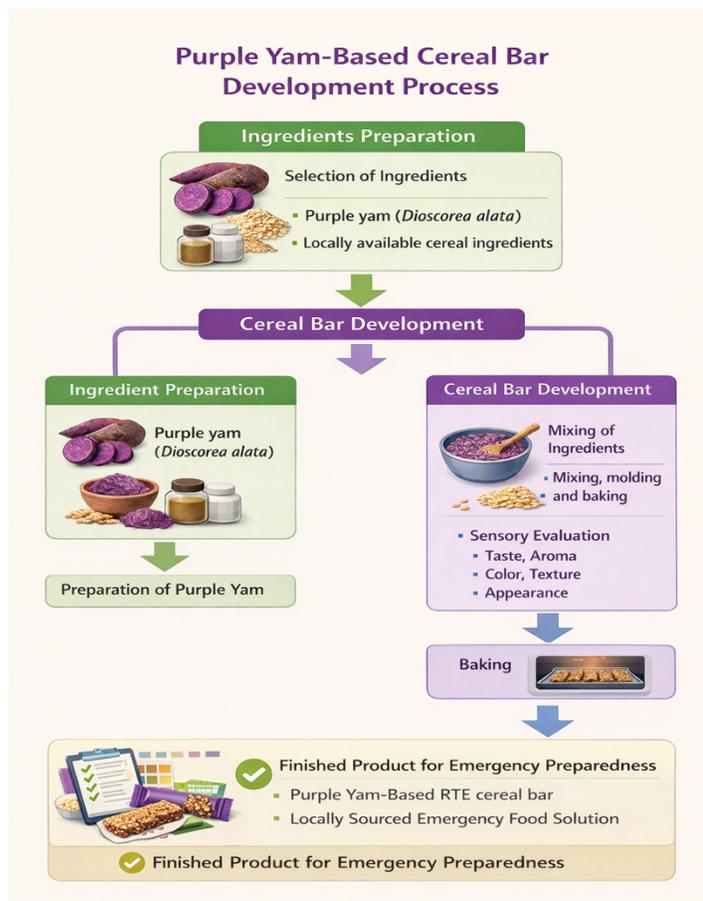


Figure 1. Conceptual Framework of the Purple Yam-Based Ready-To-Eat Cereal Bar Development for Emergency Food Applications

## Statement of the Problem

Despite the increasing frequency of natural disasters in the Philippines and the growing demand for reliable emergency food supplies, many disaster-affected communities continue to rely on imported or centrally distributed relief goods that are not always nutritionally adequate or culturally appropriate. Emergency food packs commonly prioritize caloric intake while overlooking essential micronutrients and functional components necessary to support recovery, immunity, and long-term resilience among affected populations. This situation highlights the need for locally available, nutritionally balanced, and culturally acceptable food products that can be incorporated into disaster preparedness and relief operations.

Purple yam (*Dioscorea alata*), locally known as *ube*, is an abundant and culturally significant indigenous crop in the Philippines with high nutritional and functional value. It contains carbohydrates, dietary fiber, vitamins, and bioactive compounds that contribute to antioxidant and health-supporting properties. Despite these advantages, its potential as a locally sourced ingredient for emergency food products remains largely underutilized. Most existing studies have focused on the use of purple yam in desserts, confectionery products, and general snack foods, with limited attention given to its development as a shelf-stable ready-to-eat cereal bar specifically designed for disaster response.

Furthermore, limited empirical evidence exists regarding the sensory acceptability of purple yam-based cereal bars among potential consumers. Sensory acceptability is a critical factor in determining whether emergency



food products will be willingly consumed during disaster situations. Without systematic evaluation of formulation and consumer acceptance, the integration of indigenous crops such as purple yam into emergency food systems remains constrained.

Hence, there is a need to develop and evaluate a purple yam-based ready-to-eat cereal bar using locally available ingredients and to assess its sensory acceptability as a potential emergency food product that can support disaster preparedness and food security in the Philippines.

### Research Objectives

This study aimed to develop and evaluate a purple yam (*Dioscorea alata*)-based ready-to-eat cereal bar for emergency preparedness and disaster response.

Specifically, the study sought:

1. To formulate a purple yam-based cereal bar using locally available and cost-effective ingredients.
2. To evaluate the sensory properties of the developed cereal bar in terms of:
  - taste
  - aroma
  - color
  - texture
  - appearance
3. To determine the formulation with the highest overall sensory acceptability for potential use as an emergency food product

### Research Questions

This study sought to answer the following research questions:

1. What formulation of a purple yam-based cereal bar can be developed using locally available ingredients?
2. What is the level of sensory acceptability of the developed cereal bar in terms of:
  - taste?
  - aroma?
  - color?
  - texture?
  - appearance?
3. Which formulation exhibits the highest overall sensory acceptability for potential use as an emergency food product?

## RESEARCH METHODOLOGY

### Research Design

This study employed a developmental-descriptive research design, combining product development procedures with descriptive sensory evaluation. The developmental component focused on the formulation and production of a purple yam (*Dioscorea alata*)-based ready-to-eat cereal bar using locally available and cost-effective ingredients. This phase involved the systematic selection of raw materials, standardization of processing procedures, and preparation of uniform cereal bar samples following basic food product development protocols (Sommo et al., 2024).

The descriptive component was used to determine the sensory acceptability of the developed cereal bar. Specifically, it evaluated panelist perceptions in terms of taste, aroma, color, texture, appearance, and overall acceptability using a structured hedonic rating instrument. This design was considered appropriate because it allowed the study to develop an innovative food product while quantitatively describing its level of sensory acceptance among potential consumers.



## Population and Sampling and Other Sources of Data

Thirty (30) purposively selected panelists composed of university staff participated in the sensory evaluation. The panelists were adults aged 18 years and above and were familiar with basic food tasting procedures, with no known food allergies related to cereal, nuts, or purple yam ingredients.

A purposive sampling technique was employed to select respondents who were willing, available, and capable of providing reliable sensory assessments. This sampling method was considered appropriate because sensory evaluation requires participants who can meaningfully assess food quality attributes and follow tasting procedures (Lawless & Heymann, 2010).

The inclusion criteria required that respondents be willing to participate voluntarily, have normal taste perception, have no dietary restriction affecting cereal bar consumption, and be physically capable of completing sensory evaluation forms. The sensory panelists were recruited within the local community where the product evaluation was conducted.

## Research Instruments

Data were collected using a researcher-made sensory evaluation questionnaire based on the 9-point hedonic rating scale, 9 (Like Extremely), 8 (Like Very Much), 7 (Like Moderately), 6 (Like Slightly), 5 (Neither Like nor Dislike), 4 (Dislike Slightly), 3 (Dislike Moderately), 2 (Dislike Very Much), and 1 (Dislike Extremely). The instrument measured the acceptability of the cereal bar in terms of taste, aroma, color, texture, appearance, and overall acceptability.

The questionnaire underwent content validation by three experts with academic and professional backgrounds in food science, nutrition, and research methodology, each with at least five years of teaching, research, or food product evaluation experience. The validators reviewed the instrument for clarity, relevance, appropriateness, and alignment with sensory evaluation standards. Necessary revisions were incorporated based on their recommendations before final administration.

The use of a hedonic scale for sensory studies follows standard food acceptability protocols widely applied in product development research (Lawless & Heymann, 2010).

## Data Collection Procedure

During the data collection phase, the cereal bar samples were prepared following standardized food processing procedures. Fresh purple yam tubers were cleaned, peeled, sliced, dehydrated, and milled into fine material. The processed yam was then combined with cereals, nuts, binding agents, and supplementary ingredients. The mixture was molded, baked, cooled, and packaged into uniform sample portions (Sommo et al., 2024).

The sensory evaluation was conducted at the Food Technology Laboratory of Samar State University, Catbalogan City under controlled conditions with adequate lighting, ventilation, and seating arrangement to minimize external influences during tasting. Sample products were coded and presented in randomized order to reduce bias. Each panelist received coded cereal bar samples, evaluation questionnaire, instructions for proper tasting, and drinking water for palate cleansing between samples. The evaluation was conducted individually to ensure independent responses.

## Treatment of Data

The data obtained from the sensory evaluation were analyzed using descriptive statistical methods. Frequency counts and percentages were used to describe the distribution of responses for each sensory attribute. Weighted mean scores were computed to determine the level of acceptability of each formulation in terms of taste, aroma, color, texture, appearance, and overall acceptability. The following formula was used:

$$\text{Weighted Mean} = \frac{\sum(f \times x)}{N}$$

where  $f$  represents the frequency,  $x$  represents the scale value, and  $N$  represents the total number of respondents. Ranking was employed to identify the formulation with the highest overall acceptability. The computed values served as the basis for interpreting the sensory performance and practical suitability of the cereal bar as an emergency food product.



### Interpretation of Mean Scores

Mean Range	Verbal Interpretation
8.21–9.00	Like Extremely
7.41–8.20	Like Very Much
6.61–7.40	Like Moderately
5.81–6.60	Like Slightly
5.00–5.80	Neither Like nor Dislike
4.21–4.99	Dislike Slightly
3.41–4.20	Dislike Moderately
2.61–3.40	Dislike Very Much
1.00–2.60	Dislike Extremely

### Ethical Considerations

Ethical standards were strictly observed throughout the conduct of the study. Prior to data collection, approval was secured from the Office of the Institutional Human Research Ethics of Samar State University. All participants were informed of the objectives, procedures, and intended academic use of the study. Written informed consent was obtained from all respondents before participation. Panelists were assured that their responses would remain confidential and would be used solely for research purposes. Participation was voluntary, and respondents were informed of their right to withdraw at any time without penalty. All cereal bar samples were prepared under hygienic and sanitary conditions consistent with basic food safety procedures. The health, safety, and welfare of participants were prioritized throughout the conduct of the study.

### RESULTS and DISCUSSION

This chapter presents and discusses the findings of the study based on sensory evaluation results of the developed purple yam-based cereal bar. The results are organized according to the study objectives to determine the acceptability and potential suitability of the product as an emergency food application.

To formulate a purple yam (*Dioscorea alata*)-based cereal bar using locally available ingredients, three cereal bar formulations were developed: Treatment 1 (T1), Treatment 2 (T2), and Treatment 3 (T3). These formulations differed in the proportion of purple yam flakes and complementary ingredients, as presented in Table 1.

Table 1  
*Formulation of Purple Yam-Based Cereal Bar*

Components (Ingredients)	Function	Cost (Peso)	Trial 1		Trial 2		Trial 3	
			Weight (gram)	60 %	Weight (gram)	50 %	Weight (gram)	40%
<b>Purple Yam Flakes</b>	Base/Main Carbohydrate Source	66.00	600	60%	500	50%	400	40%
<b>Puffed Rice</b>	Light texture	30.00	70	7%	50	5%	70	7%
<b>Rolled Oats</b>	Structure and texture	36.00	50	5%	70	7%	70	7%
<b>Sliced Almonds</b>	Crunch and nutrition	20.00	30	3%	80	8%	80	8%
<b>Sesame Seeds</b>	Flavor enhancer	10.00	10	1%	10	1%	10	1%
<b>Flax Seeds</b>	Binder & nutrient booster	30.00	20	2%	40	4%	50	5%
<b>Peanut Butter</b>	Binder and flavor	12.00	30	3%	30	3%	20	2%



<b>Melted Butter</b>	Binder and mouthfeel	4.00	10	1%	10	1%	10	1%
<b>Granulated Sugar</b>	Sweetener	10.00	50	5%	50	5%	90	9%
<b>Evaporated Milk</b>	Binder	16.00	-	-	80	8%	130	13%
<b>Condensed Milk</b>	Sweet binder	14.00	30	3%	30	3%	30	3%
<b>Water</b>	Hydration	-	100	10%	50	5%	40	4%
<b>TOTAL</b>		<b>₱248.00</b>	<b>1,000g</b>	<b>100%</b>	<b>1,000g</b>	<b>100%</b>	<b>1,000g</b>	<b>100%</b>

Table 1 shows that the proportion of purple yam flakes gradually decreased from 60% in T1 to 40% in T3, while cereal components, nuts, seeds, and dairy ingredients were adjusted to improve texture, flavor, and binding capacity. This variation aimed to achieve a balance between nutritional contribution, sensory quality, and product stability.

The reduced proportion of purple yam in later formulations suggests that excessive root crop incorporation may influence density and compactness, which can affect consumer preference and handling properties. Similar findings have shown that high levels of root crop flour may produce denser food matrices and reduce palatability in cereal-based snack products (Pérez-Ramírez et al., 2022). Meanwhile, increasing oats, puffed rice, and nuts likely improved structural lightness and energy density, both of which are desirable characteristics in emergency food products because they support portability and caloric efficiency (Sommo et al., 2024)

The inclusion of flax seeds, peanut butter, and dairy-based binders also appears to have contributed to improved cohesion and mouthfeel, supporting reports that fat-protein binders enhance compactness and reduce crumbling in cereal bars (Chaudhary et al., 2021). Overall, the findings indicate that locally available purple yam can be effectively combined with cereal and binding ingredients to produce a compact and acceptable food product for emergency use.

## Evaluation of Sensory Properties of the Developed Purple Yam Cereal Bar

### 2.1 Taste

Table 2  
Mean Scores of Purple Yam Cereal Bar in Terms of Taste

Treatments	Mean	Interpretation
T1	8.3	LE
T2	8.2	LE
T3	8.9	LE
<b>Grand Mean</b>	<b>8.5</b>	<b>LE</b>

Legend: LE - Like Extremely

As shown in Table 2, all formulations obtained high mean scores for taste, ranging from 8.2 to 8.9, interpreted as Like Extremely. The high acceptability score suggests that the balance between purple yam sweetness and complementary cereal ingredients produced a flavor profile that was appealing to the sensory panelists. This indicates that purple yam can be effectively integrated with cereal-based ingredients without compromising taste quality, which is a critical factor for emergency food products that must be readily consumed by affected populations.

Thermal processing during baking may also have enhanced flavor development through caramelization and Maillard reactions, which are known to improve taste quality in baked food products (Chaudhary et al., 2021). The findings indicate that purple yam can be successfully incorporated into cereal bars without compromising taste quality, which is essential for emergency food products that must remain acceptable under stressful consumption conditions.



## 2.2 Aroma

Table 3

*Mean Scores of Purple Yam Cereal Bar in Terms of Aroma*

Treatments	Mean	Interpretation
T1	8.1	LE
T2	8.3	LE
T3	8.8	LE
<b>Grand Mean</b>	<b>8.4</b>	<b>LE</b>

Legend: LE - Like Extremely

Table 3 indicates that aroma acceptability remained consistently high across all formulations. Treatment 3 recorded the highest aroma score (8.8), indicating that this formulation produced the most desirable aromatic profile. The combination of purple yam, dairy ingredients, nuts, and baking treatment likely enhanced aroma complexity through the release of volatile compounds during heating.

Previous studies have shown that thermal processing intensifies desirable aromatic compounds in cereal-based snack products, particularly roasted and caramelized notes that improve consumer preference (Kaur & Kapoor, 2021). The findings suggest that aroma development contributed substantially to overall acceptability, which is particularly important in emergency food products because aroma strongly influences willingness to consume unfamiliar packaged foods.

## 2.3 Color

Table 4

*Mean Scores of Purple Yam Cereal Bar in Terms of Color*

Treatments	Mean	Interpretation
T1	8.2	LE
T2	8.3	LE
T3	8.8	LE
<b>Grand Mean</b>	<b>8.4</b>	<b>LE</b>

Legend: LE - Like Extremely

As presented in Table 4, Treatment 3 obtained the highest score, suggesting that this formulation preserved a more appealing purple coloration while maintaining product uniformity. The attractive purple appearance likely resulted from retained anthocyanin pigments naturally present in purple yam. Anthocyanin-rich food products are known to maintain visual appeal when processed under controlled thermal conditions that minimize pigment degradation (Pérez-Ramírez et al., 2022). Visual acceptability is particularly important in emergency foods because appearance affects first acceptance and perceived food quality.

## 2.4 Texture

Table 5

*Mean Scores of Purple Yam Cereal Bar in Terms of Texture*

Treatments	Mean	Interpretation
T1	7.9	LV
T2	8.5	LE
T3	8.2	LE
<b>Grand Mean</b>	<b>8.2</b>	<b>LE</b>

Legend: LV - Like Very Much  
LE - Like Extremely



Table 5 results suggest that the natural sweetness and color of purple yam contributed positively to consumer preference suggesting that this formulation achieved the most favorable balance between firmness, chewiness, and cohesiveness. The proportion of binders and cereal ingredients likely improved starch interaction and structural integrity. Studies indicate that proper binder proportion and starch gelatinization improve texture quality in cereal bars by enhancing compactness while preventing excessive hardness (Chaudhary et al., 2021). Suitable texture is important in emergency foods because products must remain stable during storage and transport while remaining easy to chew and consume.

## 2.5 Appearance

**Table 6.** Mean Scores of Purple Yam Cereal Bar in Terms of Appearance

Treatments	Mean	Interpretation
T1	8.3	LE
T2	8.4	LE
T3	8.7	LE
<b>Grand Mean</b>	<b>8.5</b>	<b>LE</b>

Legend: LE - Like Extremely

Table 6 shows that Treatment 3 obtained the highest appearance score (8.7), indicating that respondents preferred its visual uniformity, surface smoothness, and color consistency. Uniform appearance contributes to perceived product quality and consumer confidence in ready-to-eat products. The findings suggest that visual quality supported overall acceptance of the developed cereal bar as an emergency food product.

## Conclusions

The findings indicate the potential effectiveness of purple yam (*Dioscorea alata*)-based ready-to-eat cereal bar as a culturally acceptable and locally sourced food product for emergency preparedness. Sensory evaluation showed consistently high acceptability across taste, aroma, color, texture, and appearance, indicating that the developed formulations met consumer expectations for sensory quality. Among the three formulations, Treatment 3 obtained the highest ratings in most sensory attributes, while Treatment 2 showed the most preferred texture characteristics. These findings suggest that moderate purple yam inclusion combined with balanced cereal, nut, and binder components improves product acceptability. The positive sensory responses further indicate that purple yam has potential as an indigenous ingredient for compact and shelf-stable emergency foods. The findings also support the value of integrating locally available crops into disaster nutrition strategies to strengthen food security and community resilience. The study focused primarily on sensory acceptability; physicochemical evaluation remains necessary for full emergency food validation.

## Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. Local government units and disaster relief agencies may consider integrating purple yam-based cereal bars into emergency food packs and community stockpiling initiatives to promote locally sourced nutrition during disasters.
2. Food researchers and product developers may explore refining the formulation through incorporation of additional nutrient-dense local ingredients such as legumes, fortified cereals, and seeds to improve nutritional quality.
3. Future researchers may conduct nutritional and shelf-life analyses to further evaluate the product.
4. Subsequent research may prioritize proximate and nutritional analyses to determine the product's contribution to dietary requirements in emergency feeding programs.



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