



Production and Commercialization of Sorit Bread in Nigeria

Richard-Nwachukwu, N., & Ogbonda, K.H.

¹⁻²Department of Biology, Faculty of Natural and Applied Science, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt. Nigeria.

*Corresponding author email: nkbyke@gmail.com

Abstract

In this study, the production, commercialization and consumer acceptability of *sorit* bread in Nigeria are discussed. To reduce the dependency on imported wheat due to its high cost, *sorit* bread is developed from a composite of soybean, rice and wheat flour. The study employed research and development, market analysis and sensory evaluation techniques in determining the production, commercialization and consumer acceptability of the product respectively. The genesis of *sorit* bread lies in extensive research aimed at creating a bread product that not only appeals to the palate but also addresses nutritional deficiencies common in conventional bread. The recipe for *sorit* bread is a fine balance of tradition and innovation. The key ingredients included wheat flour, local rice flour, and soybean flour in a 70:15:15 ratio, respectively. Port Harcourt City was used as a target market with a population of over three million people with a high need for healthier food. The result of the sensory evaluation and general acceptability of the bread showed that *sorit* bread will be acceptable by consumers with a result of 7.40 ± 0.40 (like moderately) for colour; 6.80 ± 0.37 (like moderately) for texture; 7.80 ± 0.20 (like very much) for texture; 6.40 ± 0.25 (like slightly) for smell and 7.20 ± 0.20 (like moderately) for overall acceptability.

Keywords: Bread Production, Commercialization, SORIT Bread

Introduction

According to Adekoyeni et al. (2018) and Adekoyeni and Abdulhamid (2020), bread is a staple fermented confectionary that is made by baking dough recipes that are primarily based on or include considerable amounts of wheat or other cereal flour that are combined with other ingredients. It is offered in Nigeria in a variety of shapes, sizes, and ready-to-eat packets to suit the needs of various socioeconomic groups. It may be consumed at any time of day on its own or in combination with drinks, butter, beans, stew, and vegetables. Bread is a great present for social gatherings since it comes in a variety of sizes and packaging. Nigeria's population is expanding, and with it comes a predilection for little chops and snacks, which has led to an increase in bread consumption and utilization. In addition, bread is a different food for different individuals based on their health. Because it may be made with fruits, chocolate, butter, eggs, and coconut to improve people's health, bread is also a traditional dish in Nigeria. The Nigerian market offers a wide range of bread variations, including rye bread, fruit bread, multigrain and kibbled bread, and wheat-meal bread. Whole wheat and white bread, often known as sandwich or sugar bread, are included in the wheat-meal bread. Wheat flour that has had the bran and germ layers removed is used to make white bread (Guthrie, 2018).

In Nigeria, the bread sector has a substantial market share. The bread market is estimated to be valued ₦122.1 billion by KPMG (2016), with small and medium-sized bakeries accounting for around 72% of the market share. According to Nwatu et al. (2020), the majority of bread eaten in Nigeria is prepared by small and medium-sized bakeries and is available in a variety of sizes to fit the needs of the customer. However, the quality control of these bakeries may not be up to par. According to Odedeji and Adeleke (2010), Malomo et al. (2011), and Ohimain (2014), Nigeria's population growth, urbanization, and shifting inclination towards convenience meals have all contributed to a significant rise in bread consumption. With 198 million people, Nigeria is predicted to rank third in the world's population by 2050 (Agbara et al., 2018). The nation's average annual economic growth rate during the last five years has been 3.5%, while the anticipated national population growth rate is 5.7%. According to Statista (2016), the value growth of bread in Nigeria was recorded at 12% in 2016, whilst the growth rate for other baked goods was 11%. Even though bread is a basic food item in Nigeria and is valued for its quality, diversity, and significance, the poor can no

longer buy it because of growing manufacturing costs brought about by the rising price of wheat, a key ingredient in bread manufacture. Additionally, bread, though widely consumed, lacks essential micronutrients. It is the lack of nutrients, reliance on imported wheat flour and the rising costs that have prompted the exploration of SORIT bread production.

SORIT Bread represents a pioneering advancement in the field of food technology, emerging as a distinctive product from a fusion of traditional and innovative baking practices. This bread is a result of extensive research and development, uniquely incorporating a composite blend of wheat flour, local rice flour, and soybean flour (Richard-Nwachukwu et al., 2022). The conception of SORIT Bread is not merely a culinary innovation but a response to the growing demand for nutritionally enriched and diverse food products. Its composition is carefully formulated to enhance nutritional value while maintaining an appealing taste and texture, a feature that distinguishes it from conventional bread products. The commercialization of SORIT Bread is not just a business venture, it's a stride towards innovation, economic development, and societal welfare. Bringing research outcomes like SORIT Bread to the market bridges the gap between academic research and practical consumer needs. It exemplifies how scientific exploration can lead to tangible products that not only enhance dietary options but also bolster local agriculture by utilizing and valuing locally sourced ingredients. The production of SORIT Bread, by employing local rice and soybean flours, can stimulate local agricultural sectors, potentially reducing the dependency on imported wheat and fostering economic growth within the community. Furthermore, the commercial success of such a product can inspire further research and development in food technology, paving the way for more innovative, health-conscious, and culturally relevant food products. This aligns with global trends toward sustainable and locally sourced food products, positioning SORIT Bread not just as a culinary delight but as a symbol of a broader movement towards sustainable food practices and food security (Noort et al., 2022). Thus, this study is aimed at the development and commercialization of SORIT bread by determining the product development process, the market analysis and the consumer acceptability of SORIT bread to enable consumers to obtain a wider choice of products and allow the producer to increase market share and generate more revenue.

A study by Adomako et al. (2023) explored the feasibility of incorporating non-traditional flour sources into bread production to enhance nutritional content and support local agriculture. The methodology includes a review of existing research on composite flour use in bread making, focusing on its effects on bread quality and consumer acceptance. The results indicate that certain blends of non-traditional flours can improve the nutritional profile of bread without significantly compromising sensory attributes. The conclusion suggests that further research is needed to optimize flour blends for commercial production. Recommendations include developing strategies for large-scale implementation and consumer education on the benefits of composite bread. The study, conducted by Olapade et al. (2015) examined the impact of adding legume flour to wheat flour on bread's nutritional quality and shelf life. The methodology involved experimental baking trials with varying proportions of legume to wheat flour and subsequent analysis of the bread's nutritional content, texture, and consumer acceptability. Findings reveal that legume-enriched bread has higher protein and fibre content with acceptable taste profiles, though some textural changes were noted. The conclusion underscores the potential of legume-wheat flour blends in improving bread's nutritional value, with recommendations for further research on consumer preferences and long-term storage effects. The study by Menon et al. (2015) focused on the development of gluten-free bread using a composite of rice flour and natural additives. The aim was to create a gluten-free bread with improved texture and nutritional profile. The methodology included the formulation of various bread recipes with different proportions of rice flour and additives, followed by sensory and nutritional evaluation. The results showed that certain formulations significantly improved bread quality and acceptability. The study concluded that rice flour, when properly combined with specific additives, can produce high-quality gluten-free bread, recommending further research on cost-effective production methods. This study is in agreement with the study of Richard-Nwachukwu et al. (2022) which showed bread improvement with a partial replacement of wheat flour with rice and soybean flour.

Ayoade et al. (2020) investigated the effects of incorporating orange flesh sweet potato flour into wheat flour for bread production on nutritional enhancement and waste reduction. The methodology encompasses a series of baking experiments to determine the optimal blend for quality and acceptability. The results indicate that bread with up to 20% sweet potato flour had improved vitamin A content and was well accepted by consumers. The conclusion points to the viability of sweet potato as a sustainable, nutrient-enhancing additive in bread production, with recommendations for scaling up production and marketing strategies to boost consumer acceptance.

Ohimain (2014) assessed the prospects and challenges of commercializing composite bread in developing countries. It aims to identify factors affecting the acceptance and production of composite bread from non-wheat flour. Through a review of literature and case studies, the methodology examines both the technical and socio-economic aspects. Findings suggest that while composite bread offers nutritional and economic benefits, challenges such as consumer perception and inconsistent quality hinder widespread adoption. The conclusion emphasizes the need for improved production techniques, consumer education, and policy support, recommending targeted interventions to overcome these challenges.

Commercialization of SORIT Bread

Market Analysis

Port Harcourt, the bustling capital city of Rivers State, Nigeria, presents a fertile ground for the introduction and successful commercialization of SORIT Bread. The city's diverse demographic and rising health consciousness among its residents make it an ideal location for targeting the market of SORIT Bread.

Target Market

The primary consumers of SORIT Bread in Port Harcourt are health-conscious individuals, particularly those belonging to the working-class and middle-class segments. This includes adults ranging from 25 to 50 years, a demographic that is increasingly inclined towards healthful eating habits and is conscious about dietary choices due to lifestyle diseases and a general trend towards wellness (Smith & Taylor, 2020). Additionally, the young, urban population, which is more open to trying new products and is often on the lookout for healthier food alternatives, constitutes a significant portion of the target market. Port Harcourt's cosmopolitan nature also means that there is a substantial segment of the population with varying dietary needs and preferences, including those seeking gluten-free, high-protein, or fibre-rich diets, making it an appropriate market for SORIT Bread.

Market Need

The need for SORIT Bread in Port Harcourt arises from the evolving dietary habits and health trends among its residents. With an increase in lifestyle diseases such as obesity, diabetes, and heart conditions, there is a growing awareness and demand for healthier food options (Oluwole & Cheung, 2019). SORIT Bread, with its unique blend of wheat, local rice, and soybean flour, offers a nutritional profile that caters to these health needs. It provides a high protein and fibre content, essential for muscle development and digestive health, while maintaining a lower carbohydrate level, beneficial for weight management and diabetic diets (Richard-Nwachukwu et al., 2022). Furthermore, the inclusion of local rice flour not only enhances the carbohydrate quality but also appeals to local culinary preferences, adding to the market need for culturally relevant health foods.

Competitive Analysis

The bread market in Port Harcourt is competitive, with numerous local and national brands offering a variety of bread products. However, SORIT Bread stands out due to its unique composition and health benefits. Most competitors primarily focus on wheat-based products, with limited variations catering to health-conscious consumers. SORIT Bread's incorporation of local rice and soybean flours not only differentiates it in terms of nutritional content but also aligns it with the growing trend of incorporating local, sustainable ingredients in food products (Noorfarahzilah et al., 2014; Zain et al., 2022). This aspect of local ingredient utilization gives SORIT Bread a competitive edge, both in terms of health benefits and supporting local agriculture, resonating with consumers who are increasingly seeking products that contribute to local economies and sustainability. Moreover, the sensory acceptability of SORIT Bread, as evidenced by its texture and taste, positions it favourably against competitors whose products might compromise on these aspects for nutritional enhancement.

The market in Port Harcourt provides a promising opportunity for the introduction and growth of SORIT Bread. The city's demographic profile, coupled with a shift towards healthier eating habits and a preference for locally sourced ingredients (Wordu & Wejinya, 2020), aligns well with the unique features of SORIT Bread. Its superior nutritional profile, coupled with sensory acceptability, sets it apart from existing products in the market, positioning it to not only meet the current market needs but also to potentially expand its consumer base in the health-conscious segment of Port Harcourt's population.

Quality Control and Safety

Quality control and safety are paramount in the production of SORIT Bread. The production facility adheres to stringent hygienic standards to prevent contamination and ensure the safety of the bread (Afolabi et al., 2015). Regular microbial load testing is conducted to ensure that the bread is within the safe consumption limits as outlined by food safety regulations. The ingredients are sourced from verified suppliers to ensure their quality and freshness. Additionally, the production process is monitored at every stage, from mixing to packaging, to maintain consistent quality. The bread undergoes sensory evaluation tests to ensure that it meets the desired standards in terms of taste, texture, and aroma, thus guaranteeing consumer satisfaction. The development of SORIT Bread is a meticulous blend of scientific research and culinary expertise. The careful selection of ingredients, based on extensive research and trials, combined with a rigorous production process and strict quality control measures, ensures that SORIT Bread not only stands out in terms of taste and texture but also sets a new standard in nutritional value, catering to the health-conscious consumer of today.

Marketing Strategy

The successful commercialization of SORIT Bread requires a comprehensive marketing strategy that encompasses effective branding, targeted advertising and promotion, and strategic selection of sales channels.

Branding

The branding strategy for SORIT Bread revolves around positioning it as a health-centric and innovative product. The name 'SORIT' was carefully crafted from the three major raw materials (Soybean, rice and wheat) signifying the product's health benefits and its nutritious ingredients. This name is not only easy to remember but also effectively communicates the product's unique selling proposition. The logo for SORIT Bread would be designed to reflect both health and freshness, incorporating elements such as grains and leaves in a modern and clean design. This visual representation would be consistent across all packaging and promotional materials, reinforcing the brand's identity. Key marketing messages on the label will focus on the health benefits of SORIT Bread, emphasizing its high protein and fibre content, low carbohydrate levels, and the use of local, sustainable ingredients. These messages will cater to the growing segment of health-conscious consumers and those interested in environmentally friendly products.

Advertising and Promotion

Advertising and promotional activities for SORIT Bread will be multi-faceted, utilizing both traditional and digital channels to reach a broad audience.

Digital Marketing: A robust digital marketing campaign will be crucial. This will include a strong social media presence on platforms like Facebook, Instagram, and Twitter, where health-conscious groups and communities are active (Jiang & Yin, 2021). Search engine optimization (SEO) and search engine marketing (SEM) will be used to increase the online visibility of SORIT Bread. Additionally, influencer marketing, involving collaborations with health and wellness influencers, will be leveraged to reach a wider audience (Alvarez-Monzoncillo, 2023).

Print and Media Advertising: Targeted print advertising in health and lifestyle magazines, along with radio spots in health and wellness programs, will be used to reach a broader demographic that may not be as active online.

Promotional Activities: Organizing and participating in health fairs, food expos, and local farmers' markets will serve as direct engagement platforms with potential customers. Free tastings and product samples at these events will help in creating first-hand product experiences, generating word-of-mouth publicity.

Collaborations and Sponsorships: Collaborating with health and fitness events, and sponsoring local sports teams or health-related community events will enhance brand visibility and position SORIT Bread as a brand that supports healthy living.

Sales Channels

The selection of sales channels for SORIT Bread will be pivotal in ensuring its accessibility to the target market.

Supermarkets and Grocery Stores: These will be primary sales channels, given their wide reach. Negotiations with major supermarket chains for shelf space and in-store promotions will be a key strategy. Product placement in health and organic sections of these stores will target health-conscious shoppers directly.

Health Food Stores: These speciality stores cater to a niche but highly relevant audience. SORIT Bread will be marketed in these stores as a premium, health-oriented product.

Online Platforms: An e-commerce strategy will be developed for selling SORIT Bread. This includes a dedicated website for direct sales and listings on popular e-commerce platforms. A subscription model could also be introduced for regular customers, offering them convenience and ensuring customer loyalty.

Local Bakeries and Cafes: Collaborating with local bakeries and cafes to offer SORIT Bread as part of their menu will not only increase sales but also enhance brand visibility.

The marketing strategy for SORIT Bread will be a blend of modern digital marketing techniques and traditional advertising and promotional activities, all aimed at emphasizing the health benefits and unique features of the product. The strategic placement of SORIT Bread across various sales channels will ensure its accessibility to a diverse consumer base, thus maximizing its market reach and potential for success.

Material and Methods

The development of SORIT Bread is a testament to the intersection of scientific research and culinary innovation. This section details the journey from conceptualization to the production of SORIT Bread, highlighting the research and development process, the recipe and production methodology, and the stringent quality control and safety measures implemented.

The genesis of SORIT Bread lies in extensive research aimed at creating a bread product that not only appeals to the palate but also addresses nutritional deficiencies prevalent in contemporary diets. The initial research phase involved an in-depth analysis of various local crops that could supplement traditional wheat flour used in bread making. This was driven by the need to reduce reliance on imported wheat due to its escalating costs and to leverage locally available agricultural resources. The breakthrough came with the identification of local rice and soybean flours as viable supplements. Local rice flour, known for its high carbohydrate and fibre content, and soybean flour, rich in proteins and lipids, were found to complement wheat flour, creating a composite flour that enhances the nutritional profile of bread (Tharise et al., 2014; Hasmadi et al., 2020). Subsequent development phases involved experimenting with various ratios of these flours to achieve an optimal balance of taste, texture, and nutritional value. The final composition of SORIT Bread - a blend of wheat, local rice, and soybean flours in a meticulously calculated ratio - emerged from numerous trials and sensory evaluations (Richard-Nwachukwu et al., 2022).

The recipe for SORIT Bread is a fine balance of tradition and innovation. The key ingredients include wheat flour, local rice flour, and soybean flour in a 70:15:15 ratio, respectively (Richard-Nwachukwu et al., 2022). This blend ensures that the bread retains the familiar texture and elasticity of traditional wheat bread while being enriched with the additional nutrients from rice and soybean flour. The production process follows the standard bread-making procedure, starting from the mixing of the flour, yeast, salt, sugar and water. This is followed by kneading, proofing, shaping, and finally baking. Special attention is given to the mixing and kneading processes to ensure a uniform distribution of the composite flours, crucial for achieving consistency in texture and flavour.

SORIT bread production was done using the method as stated in Richard-Nwachukwu et al. (2022).

1. In a large bowl, 1 table teaspoon of sugar was dissolved in 2/3 cup of warm water and then 1+1/2 yeast was added. It was allowed to prove until yeast resembles a creamy foam, this took 7 minutes.
2. ¼ teaspoon of salt and 2 tablespoons of oil were mixed into the yeast. 2+1/2 cups of flour (measured in different proportions) were mixed into the yeast one cup at a time.
3. The dough was kneaded for 7 minutes and then placed in a well-oiled bowl. The bowl was covered with a damp cloth and allowed to rise until doubled in bulk, this took 1 hour.
4. The dough was punched down, kneaded for 1 minute and divided in half. Shaped into loaves and placed into two greased loaf pans. They were then allowed to rise for 30 minutes.
5. They were baked at 350 degrees F (175 degrees C) for 30 minutes.

With a population of over 200 million, Nigeria represents a massive market opportunity for affordable and nutritious bread. However, consumer knowledge and attitudes are significant barriers. Many associate whole grain and high-fibre pieces of bread with inferior taste and texture. Targeted marketing on health benefits and competitive pricing

can help drive consumer trial and adoption. Creative product positioning and patient education will be key (Folalu & Okparavero, 2021).

Sensory perception and acceptability: Determination of the sensory properties and acceptability of bread made from soybean flour, rice flour, wheat flour and composite (SORIT) flour was done. The four samples of bread were coded and presented for sensory evaluation to five panellists who have good knowledge of bread and also love eating bread. The panellists scored the colour, taste, texture, smell and overall acceptability of the bread using a nine-point hedonic scale, where 9 indicates like extremely and 1 dislike extremely (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) (Ihekoronye & Ngoddy, 2010; Lawless & Heymann, 2011; 2013; Ajala et al., 2018; Bonik et al., 2024). The samples were presented in identical containers, coded with A, B, C and D served simultaneously to ease the possibility of the panellists to re-evaluate a sample (Iwe et al, 2014; Bushman & Stack, 2016). The results were obtained by a calculation of the overall mean. The bread was considered acceptable if the mean value fell above 5 (neither like nor dislike). Necessary precautions were taken to prevent carry-over flavour during the tasting by ensuring that panellists rinsed their mouths with water after each stage of sensory evaluation.

Results

Table 1: Determination of the sensory properties and acceptability of bread made from wheat flour, local rice flour, soybean flour and the composite flour.

	Colour	Remark	Taste	Remark	Texture	Remark	Smell	Remark	Overall acceptability	Remark
Wheat	8.40±0.25	Like very much	7.20±0.37	Like moderately	7.80±0.20	Like very much	6.20±0.20	Like slightly	7.20±0.20	Like moderately
Local rice	7.40±0.40	Like moderately	3.60±0.25	Dislike moderately	1.40±0.25	Dislike extremely	5.20±0.37	Neither like or dislike	2.20±0.20	Dislike very much
Soybean	5.40±0.60	Neither like or dislike	3.40±0.20	Dislike moderately	6.60±0.40	Like slightly	5.60±0.25	Neither like or dislike	5.60±0.40	Neither like or dislike
Composite	7.40±0.40	Like moderately	6.80±0.37	Like moderately	7.80±0.20	Like very much	6.40±0.25	Like slightly	7.20±0.20	Like moderately

Note: Composite bread = SORIT bread.

Discussion

This study has meticulously outlined the strategic approach for the introduction and commercialization of SORIT bread, a product poised to revolutionize the bread market with its unique blend of wheat, local rice, and soybean flour. The journey of SORIT bread, from its conceptualization grounded in comprehensive research and development to the final product, demonstrates a commitment to innovation and quality. With its superior nutritional profile, appealing sensory properties, and alignment with health-conscious trends, SORIT Bread stands out in a competitive market. The study has detailed a robust marketing strategy, leveraging digital and traditional platforms to reach a broad audience and strategic placement in key sales channels to ensure market penetration and accessibility. The operational plan ensures efficient production, quality control, and supply chain management, while the financial projections and funding outline a realistic and sustainable business model.

The results of the sensory properties and acceptability of bread from pure wheat flour, rice flour, soybean flour and SORIT for colour, taste, texture, smell and general acceptability conducted on 5 panellists revealed that most of them had a moderate likeness for SORIT bread colour. The taste of SORIT bread was moderately liked by the participants. According to the judgment of the participant, the texture of SORIT bread came out to be more preferred. By the opinion of the panellists, the smell of SORIT bread was liked slightly. The overall remark on the general acceptability of the bread favoured only the wheat bread and the SORIT bread. This suggests that SORIT bread will be acceptable to consumers.

Conclusion

The environmental and social responsibility of SORIT bread is integral to its ethos, with sustainable production practices and community engagement at its core. This commitment not only enhances the brand's appeal but also aligns with contemporary global trends towards sustainability and ethical business practices. In summary, SORIT

bread is not just a product; it's a vision for a healthier, more sustainable future in food consumption. We invite stakeholders, investors, and partners to join us in this exciting venture. Your support and investment will not only contribute to the commercial success of SORIT bread but also to the advancement of sustainable and health-conscious food choices. Together, we can make SORIT bread a household name and a benchmark for innovation and responsibility in the food industry. Let's embark on this journey to nourish, sustain, and inspire.

Recommendations

- Large-scale production of local rice and soybeans should be adopted by large milling companies to reduce dependency on imported wheat
- To explore consumer acceptability of SORIT bread in different regions, pilot bakeries need to be established to prepare the market for SORIT bread.
- In addition, effort should be made in the processing process of SORIT bread to reduce the beany flavour.

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