

## GEN Z'S PREFERENCE FOR VARIATIONS IN FAT SOURCES IN ENGLISH FRUIT CAKE

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### Abstract

**Keywords:**

English Fruit Cake,  
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Preference Test,  
Preference Level.

*This study aims to analyze Generation Z preferences as influenced by variations in fat sources, particularly in relation to product texture, aroma, taste, and overall acceptability. The variations in fat sources examined in this study consisted of 250 grams of butter, 250 grams of margarine, and 250 grams of a combination of butter and margarine. Differences in fat composition are known to affect the physical and sensory characteristics of food products, making fat selection an important aspect of product formulation. The research employed a preference test using a survey method involving 20 Generation Z respondents aged 18–28 years. Generation Z represents a significant consumer segment whose food preferences are strongly shaped by sensory attributes such as texture, aroma, and taste. These attributes play a crucial role in determining product acceptance and purchasing decisions within this demographic group. The findings of this study provide an overview of how different fat sources influence sensory characteristics and consumer preferences. Variations in fat sources resulted in perceptible differences in texture, aroma, and taste, which in turn affected the level of preference among Generation Z respondents. Overall, this study contributes to a better understanding of Generation Z consumer preferences and emphasizes the need for product innovation that aligns with their sensory expectations. The insights gained from this research may serve as a reference for food producers in developing products that are more appealing to Generation Z consumers.*

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## INTRODUCTION

English Fruit Cake was selected as the object of this study because its preparation technique was only recently introduced during practical learning activities conducted in the past few weeks. This condition generated interest in conducting a more in-depth observation of the characteristics of the cake, particularly when variations are applied to the ingredients used. This research was carried out through an experimental approach focusing on the use of different fat sources. The variation in fat sources is expected to produce differences in texture, taste, and overall quality of the resulting English Fruit Cake.

English Fruit Cake is a traditional British cake that is well known for its high content of dried fruits. The cake is prepared from a basic cake batter enriched with various types of dried fruits, such as raisins, currants, cherries, apricots, and dried citrus peel, which contribute natural sweetness and a distinctive aroma. In addition, English Fruit Cake has a relatively dense and moist texture, allowing it to maintain its quality and flavor over an extended period. This cake is commonly served at special occasions such as Christmas celebrations, weddings, and other traditional events, giving it strong cultural significance within British society (Larousse Gastronomique, 2018).

Traditionally, English Fruit Cake uses alcohol, such as rum, to soak the dried fruits prior to baking. Besides being used for soaking, rum may also be brushed or poured over the cake after baking. The cake is then wrapped and stored in a cool environment, which helps preserve its quality and extend its shelf life. This traditional technique highlights the complexity of English Fruit Cake production and the importance of ingredient selection in determining its final characteristics.

In the development of culinary science and food technology, experimentation with raw materials has become an essential approach to improving food quality, both in terms of sensory attributes and consumer acceptance. One of the most critical ingredients in bakery products is fat. Fat functions not only as a source of energy, but also plays a significant role in determining the physical and sensory characteristics of baked goods, including texture, moisture, flavor, and aroma. Therefore, the selection of fat type is a crucial factor that must be carefully considered in cake production.

In cake making, fat contributes to softening the dough structure by limiting gluten formation, resulting in a more tender and moist texture. Fat also serves as a carrier of flavor and aroma, which is particularly important in complex bakery products such as English Fruit Cake. Differences in fat characteristics, including fatty acid composition, melting point, and plasticity, can lead to noticeable variations in the final product. Butter is widely recognized for its rich flavor and distinctive aroma, while margarine is known for its stability and cost efficiency, making it commonly used in large-scale production. A combination of butter and margarine may offer a balance between desirable sensory qualities and ingredient efficiency.

English Fruit Cake was chosen as the research object due to its unique and complex characteristics. Its high dried fruit content contributes to a dense structure and distinctive moisture level. Moreover, the preparation process is relatively lengthy and involves specific techniques, such as fruit soaking and extended baking time. This complexity makes English Fruit Cake an appropriate medium for examining the effects of ingredient variations, particularly fat sources, on the final quality of the product. Changes in consumer preferences also play an important role in food product development. Generation Z, as a consumer group that is increasingly dominating the

market, demonstrates preference characteristics that differ from previous generations. This generation tends to be more critical of sensory qualities such as taste, aroma, and texture, and is generally more open to product innovation. Generation Z consumers are also more inclined to evaluate food products based on direct consumption experiences. Therefore, understanding Generation Z's preference levels toward food products is both relevant and strategic in the development of bakery items.

This study is important because it integrates two key aspects: experimentation with raw materials in traditional cake production and the analysis of Generation Z consumer preferences. By applying variations in fat sources to English Fruit Cake, this research is expected to provide insights into the effects of butter, margarine, and their combination on the cake's sensory characteristics. The findings of this study are expected to offer both academic contributions and practical references for culinary practitioners and bakery industries in developing products that align with the preferences of younger consumers.

Furthermore, this study is expected to enrich discussions on how traditional food products can be adapted to modern consumer preferences without losing their distinctive characteristics. As a traditional cake with strong historical and cultural value, English Fruit Cake has considerable potential for innovation through modifications in ingredients and processing techniques. Therefore, this research may serve as an initial step toward preserving traditional bakery products through scientifically grounded and consumer-oriented approaches.

Overall, this study aims to examine the influence of different fat sources on the sensory characteristics and preference levels of Generation Z toward English Fruit Cake. The results are expected to contribute to the field of culinary studies, particularly in bakery science, and to provide a foundation for the development of innovative, high-quality products that meet current market demands.

## LITERATUR RIVIEW

### *Generation Z Consumer Preferences in Food Products*

Generation Z refers to individuals born approximately between 1997 and 2012 and represents a consumer group with distinct attitudes and behaviors toward food products. This generation has grown up in an environment characterized by rapid technological advancement, abundant information access, and diverse culinary exposure. As a result, Generation Z consumers tend to be more critical and selective when evaluating food products, particularly in terms of sensory quality, authenticity, and overall eating experience.

Previous studies indicate that sensory attributes such as taste, texture, aroma, and visual appeal play a dominant role in shaping Generation Z's food preferences. Unlike previous generations, Generation Z consumers often prioritize immediate sensory satisfaction and experiential value when consuming food. Texture and mouthfeel are especially important, as these attributes directly influence comfort and enjoyment during consumption. In bakery products, softness, moisture, and density are frequently cited as key determinants of acceptability among Generation Z consumers.

In addition to sensory factors, Generation Z shows openness toward innovation and variation in traditional food products. While they may appreciate the cultural or historical background of traditional foods, their acceptance is often contingent upon how well the product aligns with modern taste expectations. This makes Generation Z

an important target group for product reformulation and experimentation, particularly in bakery products that rely heavily on ingredient composition.

Furthermore, Generation Z consumers tend to be more expressive in articulating their preferences and dislikes, often providing immediate feedback based on personal experience. This characteristic makes preference testing an effective method for assessing product acceptance within this demographic. Understanding Generation Z's preferences is therefore essential for developing food products that balance traditional identity with contemporary sensory appeal.

### ***The Role of Fat in Bakery Products***

Fat is one of the most essential ingredients in bakery products due to its significant influence on both physical structure and sensory characteristics. In cake formulations, fat contributes to tenderness, moisture retention, flavor development, and overall palatability. The presence of fat interferes with gluten development, resulting in a softer and more desirable crumb structure.

From a sensory perspective, fat acts as a flavor carrier, enhancing the perception of taste and aroma. It also contributes to mouthfeel, creating a rich and smooth eating experience. Cakes with inadequate fat content often exhibit dry texture and reduced flavor intensity, leading to lower consumer acceptance. Therefore, the selection and proportion of fat sources are critical factors in determining the final quality of baked products.

Different types of fat possess varying physical and chemical properties, such as melting point, plasticity, and fatty acid composition. These properties influence how fat behaves during mixing, baking, and cooling processes. Solid fats, such as butter and margarine, are commonly used in cakes because they help trap air during creaming, which contributes to volume and softness.

In traditional cake recipes, fat is often associated with indulgence and richness, qualities that are highly valued by consumers. For Generation Z, who emphasize sensory satisfaction, the role of fat becomes even more significant. Variations in fat sources may lead to noticeable differences in texture, aroma, and taste, which directly affect preference levels.

As a result, understanding the functional role of fat in bakery products is fundamental when evaluating consumer preferences, particularly in experimental studies involving ingredient variation.

### ***Characteristics of Butter, Margarine, and Their Combination***

Butter and margarine are two of the most commonly used fat sources in cake production, each possessing distinct characteristics that influence product quality. Butter is derived from milk fat and is known for its natural aroma, rich flavor, and creamy mouthfeel. The presence of milk solids in butter contributes to flavor complexity and enhances aroma during baking through browning reactions.

However, butter has a relatively low melting point, which can affect cake structure if not handled properly. It is also more sensitive to temperature and generally more expensive than alternative fats. Despite these limitations, butter is often associated with premium quality and traditional baking.

Margarine, on the other hand, is a plant-based fat designed to mimic butter's functional properties. It typically has a higher melting point and greater stability, making it easier to use in large-scale production. Margarine provides consistent texture and moisture, although its flavor is generally milder compared to butter. Due to its cost

efficiency and functional reliability, margarine is widely used in commercial bakery operations.

The combination of butter and margarine is often explored to achieve a balance between sensory quality and functional performance. By blending these fats, bakers may obtain improved aroma and taste from butter while maintaining the stability and texture provided by margarine. This combination can also reduce production costs without significantly compromising sensory quality.

For consumer preference studies, especially those involving Generation Z, comparing these fat sources offers valuable insights into how ingredient choices influence acceptance and sensory perception.

### ***English Fruit Cake as a Traditional Bakery Product***

English Fruit Cake is a traditional British bakery product characterized by its dense texture, high moisture content, and abundant use of dried fruits. Unlike lighter sponge cakes, English Fruit Cake relies on a rich formulation that includes fat, sugar, eggs, and a large proportion of dried fruits, resulting in a compact and flavorful product.

The cake holds strong cultural significance in British society and is commonly associated with festive occasions such as Christmas, weddings, and other ceremonial events. Its long shelf life and ability to retain flavor over time make it unique among bakery products. Traditionally, English Fruit Cake involves techniques such as soaking dried fruits in alcohol, which enhances flavor and preservation.

Due to its complex formulation, English Fruit Cake is highly sensitive to ingredient variations. Changes in fat type can significantly affect texture, moisture retention, and flavor balance. This makes the cake an ideal model for experimental studies examining the impact of fat sources on sensory characteristics.

While English Fruit Cake is rooted in tradition, it also presents opportunities for adaptation and innovation. Modifying ingredient composition, such as fat sources, allows researchers and practitioners to explore how traditional products can be adjusted to meet modern consumer preferences without losing their identity.

### ***Sensory Evaluation and Preference Testing in Bakery Research***

Sensory evaluation is a widely used method in food science to assess consumer perception and acceptance of food products. Preference testing, in particular, focuses on measuring the degree of liking or acceptance among consumers rather than identifying specific sensory attributes. This method is especially suitable when evaluating product variations intended for specific consumer groups.

In bakery research, preference tests are commonly used to evaluate attributes such as taste, texture, aroma, and overall acceptability. These attributes are closely linked to ingredient composition, processing methods, and formulation changes. Preference testing using untrained panelists, such as general consumers, is effective for capturing realistic market responses.

Generation Z is a suitable target group for preference testing because of their strong sensory awareness and willingness to express opinions. Surveys and hedonic scales are frequently employed to collect data on consumer liking. These methods allow researchers to identify which product variations are most favored and which attributes require improvement.

In studies involving fat source variation, preference testing provides valuable insights into how differences in formulation influence consumer acceptance. The results can guide product development by identifying formulations that best align with target

consumer expectations. Therefore, sensory evaluation and preference testing play a crucial role in linking ingredient experimentation with practical consumer-oriented outcomes.

## RESEARCH METHODS

### *Equipment and Ingredients*

The equipment used in the preparation of English Fruit Cake included a bowl (mixing container), spoon, cake mixer, rubber spatula, and digital scale. These tools were selected to ensure accurate measurement, effective mixing, and uniform consistency of the cake batter.

The ingredients used in this study consisted of 200 grams of sugar, 200 grams of flour, 250 grams of fat sources (butter, margarine, or a combination of both), 5 grams of baking powder, 160 grams of dried fruits, and four eggs. The amount of each ingredient, except for the fat source, was kept constant to ensure that any differences observed in the final product were solely influenced by variations in the type of fat used.

### *Preparation Method*

English Fruit Cake is a classic traditional British cake known for its dense texture and high content of dried fruits. The cake has a relatively compact and moist structure, allowing it to retain flavor quality for an extended period. English Fruit Cake is widely served on special occasions such as Christmas celebrations, weddings, and other traditional events, and it is also commonly presented as a gift or afternoon tea accompaniment. Due to its long-standing tradition, this cake holds strong cultural significance in British society (Larousse Gastronomie, 2018).

Traditionally, English Fruit Cake is prepared using 100% butter as the primary fat source. However, in this experiment, three variations of fat sources were applied: 100% butter, 100% margarine, and a mixture of butter and margarine. Butter is an animal-based product derived from milk cream, whereas margarine is a plant-based product made from processed vegetable oils such as palm and soybean oil. These fat sources differ in origin, flavor profile, cost, and functional properties, which may influence the sensory characteristics of the cake.

In this experiment, the only variable altered was the source of fat, using 250 grams of butter, 250 grams of margarine, or 250 grams of a combination of both. All other ingredients were used in identical proportions. The mixing process was conducted by combining all ingredients simultaneously and mixing them until a homogeneous batter was obtained. After the batter was evenly mixed, part of the dried fruits was added and gently folded in using a spoon. The batter was then poured into a 20 × 20 cm baking pan, and the remaining dried fruits were added on top as a topping.

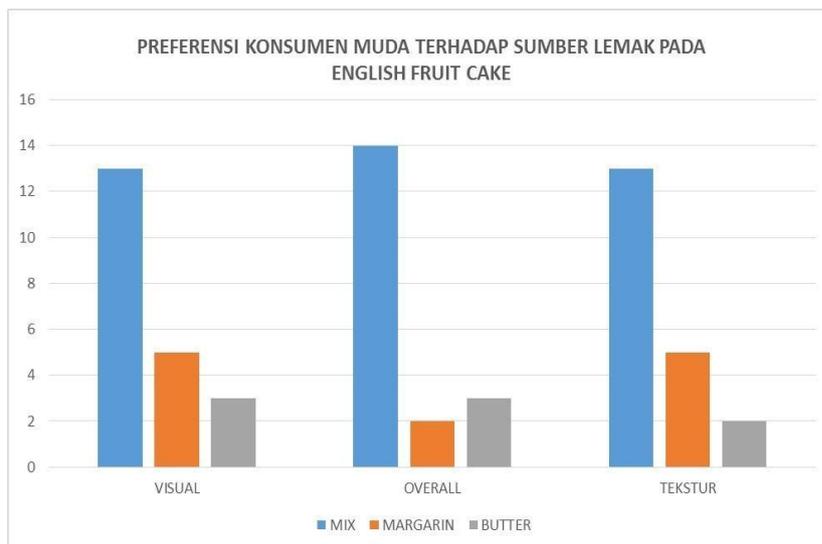
The baking process was carried out in two stages to achieve even doneness and optimal results. The first stage involved baking the cake at 150°C for 45 minutes to ensure the interior of the cake was thoroughly cooked without overbrowning the surface. The second stage was conducted at 180°C for 15 minutes to develop an appealing color and ensure overall doneness.

After baking, the English Fruit Cake was removed from the oven and allowed to cool at room temperature for 10–15 minutes before cutting. This resting period allowed the cake structure to set properly, resulting in a firmer texture and improved stability.

### Survey Research Methods

This study uses descriptive and quantitative survey methods. Data Collection Method A structured questionnaire was given to respondents to collect data from 20 respondents. The purpose of this survey is to determine the interest and preferences of the surrounding community in the variety of dietary fat products with different basic ingredients and manufacturing processes. After trying the sample, respondents were asked to fill out a questionnaire to get information about what products were most in demand (popular) from the sample.

Based on the survey results, respondents who have tried the results of our experiment showed that they prefer the formulation using 50% margarine and 50% butter, because in terms of appearance, the color is brighter so that the color of the dried fruit is striking, making the si-cake look more colorful. The aroma of the experimental results of this formulation is balanced and not too strong, the taste also tends to be sweet with a soft texture. But there are also those who like formulations that use 100% margarine, because after eating, the cake will leave a scented trace of the margarine in the mouth, the texture is a little dense and a little greasy. There are also some respondents who like the 100% butter formulation, as it tends to taste savory.



### RESULTS AND DISCUSSION

Based on the experiments that have been carried out on making English Fruit Cake with a variety of fat sources, several differences in results in texture, taste, appearance and aroma are obtained. The results are as follows:

#### **English Fruit Cake with mixed fat sources (margarine and butter)**

Before baking, the English Fruit Cake dough with a mixed fat source of margarine and butter has a balanced color, not too pale and not too yellow. The texture of the dough is also not very liquid and thick.



When it has gone through the baking process, English Fruit Cake with mixed fat sources provides a very balanced color composition and does not show an excessively greasy impression, thus providing an elegant appearance attraction for consumers. In addition to the appearance aspect, the texture quality of this product is also very superior because it has an ideal density level. The texture is not too smooth, but it still provides a snug and comfortable consistency when felt, reflecting well-maintained production standards. From a sensory perspective, this product emits an appetizing sweet scent from the first time it is smelled. The quality of the resulting taste is also very consistent with the aroma, providing a sweet sensation that fits in the mouth without causing excessive taste. Characteristic of its aroma, this cake product presents a balanced and non-pungent fragrance profile, so as to give an elegant and comfortable impression to the sense of smell. The texture quality is also very superior with a light density level of fluffy and a consistent cavity structure, so that it is able to create a smooth and heavy consumption sensation. In appearance, this product has a brighter and aesthetic color pigmentation when compared to similar products in its class. This advantage is further strengthened by the combination of proportional sweetness and a soft texture that dissolves easily in the mouth.

#### ***English Fruit Cake with Butter as the Fat Source***

Before baking, the batter prepared using butter as the fat source exhibited a paler color pigmentation compared to the standard appearance typically expected. In addition, the texture of the batter prior to baking felt noticeably denser when touched, indicating a more compact physical structure. From an aromatic perspective, the raw batter produced a very mild and subtle fragrance that was not dominant, resulting in minimal aroma diffusion into the surrounding environment.

Organoleptically, the batter already demonstrated a distinct sweet taste even before undergoing the baking process. However, during preliminary texture evaluation on the tongue, a slightly coarse sensation was detected, indicating a less smooth mouthfeel when compared to other batter variations. This characteristic suggests a significant difference in the level of structural softness achieved at this stage of preparation.

Overall, these observations indicate that the use of butter as the sole fat source influences the initial physical, sensory, and textural characteristics of the English Fruit Cake batter, particularly in terms of density, aroma intensity, and mouthfeel prior to baking.



After the baking process, this English Fruit Cake has a less dominant and not sharp aroma, so it gives a softer and smoother fragrance impression. In terms of consistency, this product has a cavity structure that tends to be tight and dense, which gives a fuller texture and gives a solid impression to each consumption. In appearance, this product displays darker color pigmentation compared to other variants, but this is in harmony with the resulting flavor profile. The main advantage of this variant lies in its unique smoky flavor and proportionally dense texture, so it is able to create a consistent harmony of flavors.

#### ***English Fruit Cake with Margarine as the Fat Source***

Prior to the baking process, the batter prepared using margarine as the fat source exhibited a more yellowish color pigmentation, with a surface appearance that appeared noticeably greasier compared to the other variations. Physically, the consistency of the batter before baking felt smoother; however, it also demonstrated a relatively high level of slipperiness, indicating a significant fat or oil content within its composition.

From an aromatic perspective, the fragrance profile of the batter was strongly dominated by the sharp and distinctive aroma of margarine. This characteristic was consistent with the sensory evaluation of taste, in which the batter displayed a combination of sweetness accompanied by a pronounced oily sensation in the oral cavity. This created a distinctive textural impression resulting from the high fat content used in the formulation.



After baking, the English Fruit Cake made with margarine exhibited a highly appealing and appetizing aroma, providing strong sensory attraction. Overall, this product demonstrated a very soft and fluffy texture with evenly distributed air pockets, resulting in a light and tender mouthfeel when touched and consumed. In terms of appearance, the cake showed a bright and visually appealing color, although its brightness level remained slightly lower than that of the mixed-fat variation.

In addition to its visual appeal, this variant offered a richer savory flavor on the palate, accompanied by a strong and long-lasting aromatic aftertaste in the mouth, creating an intense sensory experience. These findings indicate that substituting butter with margarine, or combining both fat sources, while maintaining the same processing technique, significantly influences the texture, flavor, and aroma characteristics of English Fruit Cake.

## CONCLUSION

Variations in fat sources used in English Fruit Cake were found to produce noticeable differences in appearance and texture. The formulation using 100% margarine resulted in a slightly dense and oily texture with a predominantly sweet taste, while producing an attractive color that was not overly pale. In contrast, the formulation using 100% butter produced a very dense texture, a darker color, and a flavor profile that tended to be more savory. Meanwhile, the formulation combining 50% margarine and 50% butter resulted in a balanced texture that felt soft in the mouth, with a well-balanced aroma that was not overly strong, although it produced a slightly paler color.

The results of the study indicate that Generation Z respondents tended to prefer the formulation using a combination of 50% butter and 50% margarine. This combination was perceived as providing a better balance between taste and aroma, as well as a more desirable texture compared to formulations using 100% margarine or 100% butter. These findings demonstrate that the selection of fat sources plays a crucial role in determining the overall quality of English Fruit Cake.

Based on the findings regarding Generation Z's preferences toward variations in fat sources in English Fruit Cake, it is recommended that food business operators pay closer attention to the selection and combination of fat sources during product formulation. The use of a 50% butter and 50% margarine combination may serve as a promising alternative, as it is able to produce a balance of sensory characteristics such as taste, aroma, texture, and color that are more favored by Generation Z. In addition, adjustments in fat source formulation should also consider production cost efficiency without compromising product quality, thereby enabling the product to remain competitive in the market.

## BIBLIOGRAPHY

- Angraini, E., Anwar, S. E. B., Rama, A., Ganefri, & Yulastri, A. (2023). *Entrepreneur of pastry art*. Uwais Inspirasi Indonesia.
- Aprilia, A., & Harianto, A. (2023). *Pengetahuan patiseri dan bakeri*. PT RajaGrafindo Persada.
- Boga, Y. (2013). *Terampil membuat cake dan pastry*. Gramedia Pustaka Utama.
- Davidson, A. (2014). *The Oxford companion to food* (3rd ed.). Oxford University Press.
- Fadlurrahman, M. (2023). *Studi pembuatan kue tradisional Apang Bugis dengan substitusi tepung sukun (Artocarpus communis)* [Doctoral dissertation, Universitas



- Hasanuddin].
- Glasse, H. (1747). *The art of cookery made plain and easy*. Prospect Books. <https://archive.org/details/TheArtOfCookery>
- Larousse Gastronomique. (2018). *Larousse gastronomique: The encyclopedia of food, wine & cookery*. Clarkson Potter. <https://groupdocs.vip/lookup/mL1EC/603412/4982160-larousse-gastronomique>
- McGee, H. (2004). *On food and cooking: The science and lore of the kitchen*. Scribner.
- Mintel Group Ltd. (2020). *Generation Z food preferences report*. Mintel.
- Nimpuno, D. (2017). *Ayo membuat masakan & kue dari bahan halal*. Gramedia Pustaka Utama.
- Nuttall, P. (2004). *The history of English food*. Routledge.
- Paran, S. (2009). *100+ tip anti gagal bikin roti, cake, pastry, & kue kering*. Kawan Pustaka.
- Rayner, T. (2017). *Simple & moist cake: Lengkap soft cake, bolu, kue kering, puding & roti*. Kawan Pustaka.
- Robinson, J. (2015). *Eating on the wild side: The pharmacologic, ecologic, and social implications of wild plant foods*. University of New Mexico Press.
- Sufiat, S. (2019). *Kunci sukses pengolahan adonan cake*. Syiah Kuala University Press.
- The Culinary Institute of America. (2019). *The professional chef* (10th ed.). John Wiley & Sons.
- United States Department of Agriculture. (n.d.). *FoodData Central*. <https://fdc.nal.usda.gov/>

