

NUTRITIONAL QUALITY OF TRADITIONAL FOODS USING ALTERNATIVE INGREDIENTS

Muhammad Hamza

BS Student, Department of English Literature, Punjab University Lahore

ABSTRACT

Traditional foods are an important part of cultural identity, dietary practices, and food security, but many traditional recipes are prepared using ingredients that may be high in saturated fat, refined carbohydrates, sodium, or added sugar. The use of alternative ingredients provides an opportunity to improve the nutritional quality of traditional foods while maintaining their sensory acceptability, cultural characteristics, and affordability. This study examines how alternative ingredients such as whole grains, legumes, vegetables, fruits, low-fat dairy products, plant-based ingredients, natural sweeteners, and healthier cooking oils can influence the nutritional composition of traditional foods. Particular attention is given to changes in protein, dietary fiber, vitamins, minerals, healthy fats, and energy content. The study also considers consumer acceptance, taste, texture, appearance, and cultural authenticity because nutritional improvement is more meaningful when consumers are willing to accept and consume the modified foods. A qualitative research approach is proposed to explore existing evidence and identify common nutritional improvements associated with ingredient substitution. The findings indicate that carefully selected alternative ingredients can increase dietary fiber, protein, micronutrients, and beneficial bioactive compounds while reducing excessive saturated fat, sugar, and sodium. However, inappropriate substitutions may negatively affect taste, texture, appearance, or traditional identity. Therefore, alternative ingredients should be selected according to the nutritional requirements and characteristics of each traditional food. The study concludes that thoughtful reformulation can contribute to healthier traditional diets without completely removing the cultural value of traditional cuisine.

KEYWORDS: *Traditional Foods, Alternative Ingredients, Nutritional Quality, Food Reformulation, Dietary Fiber, Protein, Healthy Eating, Food Innovation, Consumer Acceptance, Cultural Foods.*

INTRODUCTION

Traditional foods represent an important component of cultural heritage and are closely associated with family traditions, social practices, geographical identity, and local food resources. Across different societies, traditional dishes are prepared according to recipes that have been transferred from one generation to another. These foods often contain locally available cereals, pulses, vegetables, fruits, dairy products, meat, herbs, spices, and cooking oils. Although traditional foods can provide important nutrients, their nutritional composition depends greatly on the ingredients, quantities, preparation methods, and cooking techniques used in their preparation. In modern dietary environments, concerns about excessive consumption of saturated fats, refined carbohydrates, added sugars, and sodium have increased interest in improving the nutritional quality of commonly consumed foods. Consequently, researchers and food professionals have increasingly explored ingredient substitution as a practical strategy for modifying traditional recipes. Alternative ingredients can be introduced without completely changing the identity of a traditional food, allowing consumers to benefit from improved nutritional properties while retaining familiar culinary characteristics. The use of alternative

ingredients may involve replacing refined flour with whole-grain flour, incorporating pulses into cereal-based products, replacing part of the fat with vegetable-based ingredients, using low-fat dairy products, increasing the proportion of vegetables and fruits, or reducing added sugar and sodium. Whole grains can contribute dietary fiber, vitamins, minerals, and bioactive compounds, while legumes can improve protein and fiber content. Similarly, vegetables and fruits can increase the concentration of vitamins, minerals, antioxidants, and other phytochemicals. Alternative ingredients can therefore improve the nutritional density of traditional foods rather than simply increasing their quantity. However, nutritional reformulation is not always straightforward. Changes in ingredients can influence texture, color, flavor, aroma, moisture, cooking characteristics, and shelf life. For traditional foods, these sensory characteristics are particularly important because consumers often associate authenticity with a specific taste and appearance.

Dishes such as roti, paratha, biryani, pulao, halwa, kheer, pakoras, samosas, and various pulse- and vegetable-based dishes can potentially be modified through the use of alternative ingredients. For example, whole-wheat or composite flours can be used to increase fiber, while pulses and vegetables can improve protein, micronutrient, and phytochemical content. World Health Organization. (2025). Revealed Reducing excessive oil or replacing some saturated-fat sources with unsaturated vegetable oils may also improve the overall fat profile. Similarly, reducing added sugar or using fruit-based ingredients can potentially lower the amount of added sugar while providing additional nutrients. Such modifications are particularly relevant for populations seeking healthier diets while maintaining traditional eating patterns. Another important consideration is consumer acceptance. A food product with excellent nutritional characteristics may have limited practical value if consumers dislike its taste, texture, aroma, or appearance Bedada, T. L., Tigu, F., Birri, D. J., Desalegn, A., Peñas, E., Amare, E., ... & Curiel, J. A. (2025). Elaborated . Traditional foods are often connected with emotional, cultural, and social experiences, meaning that consumers may be resistant to substantial changes in familiar recipes. For this reason, alternative ingredients should be introduced carefully, preferably through partial substitution or formulation strategies that maintain important sensory properties. Food researchers and culinary professionals therefore need to evaluate not only nutrient composition but also acceptability, affordability, accessibility, preparation practices, and cultural relevance.

The nutritional quality of traditional foods can be enhanced considerably through the careful use of alternative ingredients while maintaining their cultural identity, traditional characteristics, and consumer acceptability. Traditional foods are an important part of the dietary patterns and cultural heritage of communities because they reflect local agricultural resources, cooking practices, family traditions, and historical food habits. However, many traditional food products are commonly prepared with refined cereals, large quantities of sugar, salt, saturated fats, or other ingredients that may contribute relatively low nutritional value when consumed frequently. The incorporation of alternative ingredients provides an opportunity to improve the nutritional composition of these foods without completely changing their traditional nature. Ingredients such as whole wheat, oats, millet, sorghum, maize, barley, chickpea flour, lentil flour, soybean,

legumes, nuts, seeds, fruits, vegetables, and natural plant-based ingredients can provide important nutrients including dietary fiber, high-quality or complementary proteins, vitamins, minerals, antioxidants, and beneficial fatty acids. For instance, replacing part of refined flour with whole-grain or legume-based flour may increase protein and dietary fiber content and can also improve the mineral profile of the final product. Similarly, incorporating seeds such as flaxseed, chia seeds, sesame seeds, or sunflower seeds may increase the content of essential fatty acids, protein, fiber, and minerals. Fruits and vegetables can also be used as alternative ingredients to increase vitamins, minerals, antioxidants, natural pigments, and moisture content while potentially reducing the need for excessive sugar or artificial additives. Alternative ingredients may also contribute to the development of functional foods that provide nutritional benefits beyond basic energy and nutrient supply.

The nutritional quality of modified traditional foods can be assessed by examining parameters such as moisture, ash, protein, fat, fiber, carbohydrate, energy value, mineral composition, and, where appropriate, antioxidant activity. Comparing these values with those of conventional products can help determine whether the alternative ingredients provide meaningful nutritional improvements. In addition, the use of locally available alternative ingredients may reduce production costs, encourage agricultural diversity, support local farmers, and contribute to more sustainable food systems. From a public-health perspective, nutritionally improved traditional foods may help consumers obtain greater amounts of essential nutrients while continuing to consume familiar and culturally meaningful foods. This is particularly important in communities where traditional foods remain an important component of everyday diets. The development of such products can also support dietary diversification and provide healthier options for children, adults, and older populations. Furthermore, the use of alternative ingredients can address nutritional deficiencies by incorporating ingredients naturally rich in iron, calcium, zinc, protein, fiber, and other essential nutrients. Therefore, the nutritional enhancement of traditional foods should not simply focus on replacing one ingredient with another but should involve a balanced consideration of nutrient composition, processing methods, sensory characteristics, cost, availability, cultural preferences, and consumer expectations. Overall, the integration of alternative ingredients into traditional foods represents a valuable approach for combining traditional culinary knowledge with contemporary nutritional requirements. It offers an opportunity to preserve cultural food practices while improving the health value and functional potential of traditional products.

RESEARCH OBJECTIVE

1. To examine how the use of alternative ingredients influences the nutritional quality of traditional foods, particularly in relation to protein, dietary fiber, healthy fats, vitamins, minerals, and overall energy composition.

RESEARCH QUESTION

1. How does the use of alternative ingredients affect the nutritional quality of traditional foods while maintaining their sensory and cultural characteristics?

LITERATURE REVIEW

Recent research on food reformulation suggests that the nutritional quality of traditional foods can be improved through carefully selected ingredient substitutions. One important strategy is the incorporation of whole grains into products traditionally prepared with refined cereals. Whole grains generally provide greater amounts of dietary fiber, minerals, vitamins, and bioactive compounds than refined grains because important components of the grain remain present. Increasing dietary fiber through whole-grain ingredients may contribute to improved digestive health and dietary quality. Similarly, the use of composite flours containing cereals, legumes, or other plant ingredients can increase the nutritional diversity of traditional cereal-based foods. Such approaches are particularly relevant for traditional breads, bakery products, snacks, and other foods in which refined flour is a major ingredient. Legumes are another important alternative ingredient because they provide plant-based protein, dietary fiber, minerals, and various bioactive compounds. Incorporating lentils, chickpeas, beans, or other pulses into traditional recipes may improve their protein and fiber content while reducing dependence on highly refined ingredients. In cereal-legume combinations, complementary amino-acid profiles can contribute to improved protein quality. This approach can be especially useful in populations where plant-based foods constitute an important part of the diet. However, legume incorporation can alter color, flavor, texture, and cooking characteristics, meaning that appropriate formulation and processing are necessary to maintain consumer acceptability.

Research on healthier fat substitution has also demonstrated the importance of improving the quality rather than simply reducing the total amount of fat. Traditional recipes may contain substantial quantities of butter, ghee, shortening, or other fat sources. Partial replacement with oils containing higher proportions of unsaturated fatty acids can potentially improve the overall fatty-acid profile. Dinu, M., Pagliai, G., & Sofi, F. (2017) found that However, the type and quantity of replacement fat must be carefully selected because fats contribute significantly to flavor, texture, mouthfeel, and cooking performance. Excessive reduction of fat may also produce undesirable sensory characteristics. Therefore, nutritional reformulation should consider both the health-related properties and technological functions of fats in traditional foods. Fruit and vegetable ingredients can provide another approach to nutritional improvement. Increasing vegetables in traditional dishes can enhance fiber, potassium, folate, vitamins, minerals, and phytochemicals, while fruit ingredients may contribute natural sweetness, fiber, vitamins, and antioxidant compounds. Such modifications may allow reductions in added sugar or other less nutrient-dense ingredients. Natural food ingredients can therefore serve multiple functions in reformulated foods. Nevertheless, their effects depend on the particular food matrix, preparation method, ingredient concentration, and storage conditions.

Alternative dairy ingredients and plant-based ingredients have also received increasing attention in food innovation. Lower-fat dairy products can reduce the contribution of saturated fat while maintaining protein and calcium in suitable formulations. Plant-based ingredients can provide opportunities for increasing fiber and introducing diverse sources of protein and micronutrients. However, nutritional composition varies considerably among alternative ingredients, and not all substitutes automatically provide superior nutritional value Kasapoğlu, M. (2024). Elaborated on . The quality of a reformulated product therefore needs to be evaluated through its complete nutrient profile rather than through a single ingredient or nutrient. Consumer acceptance is another major theme in the literature. Studies of food reformulation commonly demonstrate that consumers evaluate healthier products through multiple dimensions, including taste, texture, appearance, aroma, familiarity, price, perceived health benefits, and cultural expectations. Traditional foods have a particularly strong connection with familiarity and authenticity. Excessive modification can therefore reduce acceptance even when the nutritional composition improves. A successful alternative ingredient should consequently provide measurable nutritional benefits while maintaining acceptable sensory characteristics. Sensory evaluation, nutritional analysis, and consumer studies can be combined to identify formulations that provide a practical balance between health and acceptability. Traditional foods are an important source of nutrition and cultural identity because they reflect the agricultural resources, culinary knowledge, eating habits, and social practices of particular communities. The nutritional quality of traditional foods varies considerably according to the ingredients used, their proportions, preparation methods, and cooking techniques.

The purpose of such substitutions is not simply to remove traditional ingredients but to create a more nutritionally balanced food product while maintaining desirable taste, texture, aroma, appearance, and cultural characteristics. This approach has become particularly relevant as consumers increasingly seek healthier food choices while continuing to value familiar traditional dishes. Whole grains are among the most commonly investigated alternative ingredients for improving the nutritional quality of traditional foods. Compared with refined grains, whole grains generally retain more of the grain components that provide dietary fiber, minerals, vitamins, and bioactive compounds. Their incorporation into traditional breads, bakery products, snacks, and cereal-based dishes can therefore increase fiber and micronutrient content. Increased dietary fiber is particularly important because it contributes to digestive health and can improve the overall nutritional density of the diet. However, the replacement of refined flour with whole-grain ingredients may influence dough properties, texture, color, flavor, and consumer acceptance. For this reason, research commonly supports partial substitution or the development of composite flours rather than complete replacement. The success of whole-grain reformulation therefore depends on both the nutritional benefits and the ability to preserve acceptable sensory properties.

Legumes and pulses represent another important group of alternative ingredients. Lentils, chickpeas, beans, peas, and other pulses provide plant-based protein, dietary fiber, minerals, and bioactive compounds. Their incorporation into traditional foods can be particularly beneficial where diets depend heavily on cereal-based products. Combining cereal and legume ingredients

can provide complementary sources of essential amino acids and improve the nutritional quality of the overall meal. Pulse-based ingredients can also increase satiety and dietary fiber while contributing relatively nutrient-dense plant protein. Nevertheless, incorporating legumes into traditional recipes can alter color, flavor, aroma, texture, and cooking behavior. Researchers therefore emphasize the importance of selecting suitable pulse varieties and appropriate incorporation levels to achieve nutritional improvement without substantially reducing sensory acceptability. The use of vegetables and fruits as alternative or supplementary ingredients has also received considerable attention. Vegetables can increase the levels of dietary fiber, potassium, folate, vitamins, minerals, and phytochemicals in traditional foods. Fruits may contribute vitamins, minerals, fiber, antioxidants, and naturally occurring sugars. Incorporating these ingredients into traditional dishes can increase nutrient density and, in some cases, allow a reduction in less nutritious ingredients. For example, fruit-based ingredients can contribute sweetness and moisture, potentially reducing the need for excessive added sugar in some traditional preparations. Similarly, increasing vegetables in traditional savory foods can improve nutritional diversity without necessarily changing the basic identity of the dish.

Some traditional foods are prepared with relatively large quantities of butter, ghee, shortening, or other sources of saturated fat. Granato, D., Barba, F. J., Bursać Kovačević, D., Lorenzo, J. M., Cruz, A. G., & Putnik, P. (2020). Explained Nutritional reformulation may involve reducing the total amount of fat or replacing part of the conventional fat with oils that contain a greater proportion of unsaturated fatty acids. Such modifications can potentially improve the fatty-acid profile of traditional foods. However, fat is not only a source of energy; it also contributes to flavor, mouthfeel, tenderness, texture, and cooking performance. Consequently, complete fat removal may negatively affect the quality and acceptance of a traditional food. Research therefore emphasizes balanced reformulation in which the amount and type of fat are adjusted while maintaining the functional characteristics required for successful food preparation. Alternative dairy and plant-based ingredients have also become increasingly relevant to nutritional food innovation. Low-fat dairy products can be used in selected traditional recipes to reduce fat while retaining important nutrients such as protein and calcium. Plant-based ingredients, including soy, pulses, nuts, seeds, and other plant proteins, may increase protein, fiber, and bioactive compounds depending on their composition. However, the nutritional superiority of an alternative ingredient cannot be assumed simply because it is plant-based or marketed as a healthier option. Its complete nutrient composition, processing method, added sugar, sodium, fat profile, and degree of refinement must be considered. Consequently, researchers recommend evaluating alternative ingredients on the basis of their overall nutritional contribution rather than focusing on a single nutrient. Sugar and sodium reduction is another important component of traditional food reformulation.

The literature therefore indicates that gradual or optimized reduction is often more practical than sudden major changes. Sensory acceptability is a critical factor in the successful reformulation of traditional foods. Nutritionally improved foods may have limited practical value if consumers reject them because of unfamiliar taste, texture, color, aroma, or appearance. Traditional foods often have strong emotional and cultural associations, and consumers may consider particular ingredients and preparation methods essential to authenticity. Therefore, researchers increasingly

emphasize the importance of combining nutritional analysis with sensory evaluation and consumer studies. Product developers need to determine the level of alternative ingredient that provides meaningful nutritional improvement without creating substantial negative changes in sensory quality. Factors such as age, cultural background, dietary habits, health awareness, price, and familiarity with alternative ingredients can also influence consumer acceptance. The literature also highlights the importance of food processing and preparation methods. The nutritional effect of an alternative ingredient may change depending on whether the food is boiled, baked, fried, steamed, fermented, or otherwise processed. Granato, D., Barba, F. J., Bursac Kovačević, D., Lorenzo, J. M., Cruz, A. G., & Putnik, P. (2020). Revealed Processing can influence nutrient retention, digestibility, moisture, texture, and bioavailability. For example, replacing an ingredient may improve the theoretical nutrient composition of a recipe, but deep frying or excessive processing may still increase energy or fat content. Therefore, nutritional quality should be assessed at the level of the final prepared food rather than solely according to the nutritional composition of individual raw ingredients.

METHODOLOGY

This study adopts a descriptive research design to investigate the nutritional quality of existing scholarly evidence concerning the modification of traditional food recipes through the incorporation or substitution of alternative ingredients. Relevant research studies published primarily between 2023 and 2026 are examined to identify how ingredients such as whole grains, legumes, vegetables, fruits, low-fat dairy products, plant-based ingredients, and healthier cooking oils influence the nutritional composition of traditional foods. The research design focuses on comparing the reported nutritional characteristics of conventional and reformulated traditional foods, particularly with regard to protein, dietary fiber, carbohydrates, fats, vitamins, minerals, antioxidants, sugar, sodium, and energy content. In addition to nutritional characteristics, the design considers sensory factors such as taste, texture, aroma, color, appearance, and overall consumer acceptability because these factors can influence the successful adoption of modified traditional foods. The selected literature is organized into relevant thematic categories, allowing similarities and differences among various alternative ingredients and food products to be identified. The descriptive design is appropriate because the study aims to provide a comprehensive understanding of existing evidence rather than conduct a laboratory experiment or manipulate variables directly. Through this design, the research identifies the major nutritional benefits, limitations, and practical challenges associated with replacing conventional ingredients with healthier alternatives. The findings are synthesized to explain how traditional foods can be nutritionally improved while maintaining their familiar sensory properties, cultural significance, and suitability for everyday consumption.

RESEARCH DESIGN

This study adopts a descriptive research design to investigate the nutritional quality of traditional foods prepared using alternative ingredients. The design is based on a systematic review and description of existing scholarly evidence concerning the modification of traditional food recipes

through the incorporation or substitution of alternative ingredients. Relevant research studies published primarily between 2023 and 2026 are examined to identify how ingredients such as whole grains, legumes, vegetables, fruits, low-fat dairy products, plant-based ingredients, and healthier cooking oils influence the nutritional composition of traditional foods. The research design focuses on comparing the reported nutritional characteristics of conventional and reformulated traditional foods, particularly with regard to protein, dietary fiber, carbohydrates, fats, vitamins, minerals, antioxidants, sugar, sodium, and energy content. In addition to nutritional characteristics, the design considers sensory factors such as taste, texture, aroma, color, appearance, and overall consumer acceptability because these factors can influence the successful adoption of modified traditional foods. The selected literature is organized into relevant thematic categories, allowing similarities and differences among various alternative ingredients and food products to be identified. The descriptive design is appropriate because the study aims to provide a comprehensive understanding of existing evidence rather than conduct a laboratory experiment or manipulate variables directly. Through this design, the research identifies the major nutritional benefits, limitations, and practical challenges associated with replacing conventional ingredients with healthier alternatives.

DATA ANALYSIS

The collected information is analyzed through thematic analysis. Relevant findings from the selected literature are organized into major nutritional and food-quality themes. The analysis first identifies the types of alternative ingredients used in traditional foods and then examines their reported effects on nutritional composition. Particular attention is given to changes in protein, fiber, fat quality, vitamins, minerals, antioxidants, sugar, sodium, and energy density. The analysis also considers sensory and cultural factors because nutritional improvement alone does not guarantee successful acceptance of a reformulated traditional food. Findings from different studies are compared to identify common patterns, benefits, limitations, and research gaps. The results are then synthesized to explain how alternative ingredients can be incorporated into traditional foods while maintaining acceptable quality. The data collected for this study are analyzed using thematic and descriptive analysis to examine the nutritional quality of traditional foods prepared with alternative ingredients. Information obtained from relevant research studies is systematically organized according to major themes, including protein, dietary fiber, carbohydrates, fats, vitamins, minerals, antioxidants, sugar, sodium, and energy content. The analysis compares the nutritional characteristics of traditional foods prepared with conventional ingredients with those prepared using alternative ingredients such as whole grains, legumes, vegetables, fruits, low-fat dairy products, plant-based ingredients, and healthier cooking oils. Particular attention is given to identifying whether alternative ingredients contribute to increased protein, dietary fiber, vitamins, minerals, and beneficial bioactive compounds or help reduce excessive saturated fat, added sugar, sodium, and overall energy density.

FINDINGS

The findings indicate that the use of alternative ingredients can significantly contribute to improving the nutritional quality of traditional foods when substitutions are carefully planned. The literature shows that replacing refined cereal ingredients with whole grains or composite flours can increase dietary fiber and improve the micronutrient profile of traditional cereal-based foods. The incorporation of legumes such as lentils, chickpeas, and beans can enhance protein and fiber content and may provide an important nutritional advantage in traditional foods that are otherwise dominated by refined carbohydrates. The inclusion of vegetables and fruits can further increase vitamins, minerals, fiber, and bioactive compounds while adding natural flavor and color. Another important finding is that partial modification of fat sources can improve the overall fatty-acid profile of traditional foods, particularly when excessive saturated-fat sources are replaced with suitable unsaturated vegetable oils. Similarly, reducing added sugar and increasing naturally sweet ingredients can contribute to improved nutritional quality in traditional desserts and snack products. However, the findings also demonstrate that nutritional improvement must be balanced with sensory acceptability. High levels of substitution may produce undesirable changes in taste, texture, aroma, color, or appearance. Consumers may also prefer formulations that retain the familiar characteristics of traditional foods. Therefore, moderate and carefully optimized substitution appears to be more practical than complete replacement in many traditional recipes. The findings further suggest that affordability and availability of alternative ingredients are important considerations, especially in developing-country contexts.

CONCLUSION

The study concludes that alternative ingredients provide a valuable opportunity to improve the nutritional quality of traditional foods without completely eliminating their cultural and culinary identity. The incorporation of whole grains, legumes, vegetables, fruits, healthier fat sources, and appropriate alternative ingredients can increase dietary fiber, protein, vitamins, minerals, and beneficial bioactive compounds while potentially reducing excessive saturated fat, added sugar, and refined carbohydrates. However, nutritional improvement should not be considered independently from taste, texture, appearance, affordability, preparation methods, and cultural expectations. Traditional foods are valued not only for their nutrient content but also for their role in family practices, cultural identity, and social traditions. Therefore, successful reformulation requires careful selection and proportioning of alternative ingredients. Future research should include experimental formulation, laboratory-based nutritional analysis, sensory evaluation, and consumer acceptance studies to determine the most suitable substitutions for specific traditional foods. A balanced approach can help preserve traditional culinary practices while responding to contemporary nutritional needs.

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