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Food and Food Security with Human Health Relevance

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Abstract:

A significant global concern is food and nutrition security, which depends on providing everyone with a sufficient supply of fresh and processed meals that are healthy, safe, and inexpensive. A portion of the problem of feeding 9 billion people a healthy diet by 2050 will be solved by increasing food production. But it will also be crucial to reduce food waste at every stage of the supply chain, from production to consumption, and to sustainably improve food safety, nutrient content, shelf life, and preservation through food processing. Delivering evidence-based food and nutrition interventions is a significant opportunity during individual contacts with the healthcare system. According to a growing yet convincing body of data, these kinds of systemic interventions may lead to better health outcomes as well as lower healthcare costs and utilization. The changes in primary food production systems and the impact of food processing on population health and food and nutrition security are discussed in this paper. It emphasizes how important it is to keep an eye on consumers' opinions and beliefs.

Keywords: Nutrition; Food security; Health; Consumer; Diets

1. Introduction: Security of food and nutrition is a global issue and a need for a happy, healthy community. "All people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life" is the definition of food security. In order to promote a healthy and active life, nutrition security "exists when secure access to an appropriately nutritious diet is coupled with a sanitary environment, adequate health services, and care." [1-3]. The world's population is predicted to grow from 7.3 billion in 2019 to 9 billion in 2050, meaning that by that time, 30–40% more agricultural production would be needed to meet the demands of human nutrition. There are three ways to close the energy gap: lowering the amount of food waste that occurs now, raising food production, or decreasing demand [4].

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Effective interventions for individual patients have the potential to impact population health and influence more comprehensive reforms in food and health policies when they are widely implemented. However, limited access to relevant services and programs, poor levels of physician nutrition knowledge and awareness of interventions, and a lack of research funding all hinder the realization of health benefits. In order to create a healthcare system where food and nutrition are standard components of evidence-based disease prevention and treatment, it is imperative that each of these obstacles be addressed [5, 6].

Over the past 50 years, agricultural output has increased to feed the world's rapidly expanding population. The expected population growth may require more food, therefore increasing agricultural productivity while reducing environmental degradation will still be important. However, this may not be enough on its own. Food processing prolongs food shelf life, improves food quality and nutritional availability, and minimizes loss and waste. When creating sustainable diets that are affordable for everyone, biodiversity, ecosystems, and cultural heritage are taken into account. Sustainable diets improve the health of both current and future generations while having minimal negative effects on the environment [7-9]. Reducing the incidence of food insecurity both now and in the future will call for technological innovations through cooperative efforts in food, nutrition, agriculture, and health that are socially acceptable. It is evident that a discussion of food and nutrition security must take into account a number of factors, such as efficient routes for food to be distributed between production and consumption sites, the various food laws that apply in different regions, the significance of native foods, religion and culture, urbanization, biodiversity, and climate change [3, 10, 11].

Improved cereal grain carbs for health outcomes have become more of a focus due to the potential benefits of foods high in dietary fiber and resistant starch, which include lowering the risk of Type 2 diabetes, cardiovascular disease, and enhancing gut and metabolic health [12, 13]. Interventions involving food as medicine include therapeutic meals, medically customized groceries (sometimes referred to as "farmacies" or "healthy food prescriptions"), and produce prescriptions. The depth of patient coverage and severity of these therapies varies greatly. The greatest level of involvement, medically customized meals are required for a limited but high-needs population: people with complicated medical problems who are unable to shop for or prepare meals. The US has started a number of sizable medically customized food programs

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for this demographic in their public insurance programs during the last three years, with increased usage for senior citizens suggested by legislation [14].

2. Eating healthy: A nutritious diet helps ward off noncommunicable diseases (NCDs) including diabetes, heart disease, stroke, and cancer, as well as malnutrition in all its manifestations. Good eating habits begin at an early age. Breastfeeding promotes healthy growth and enhances cognitive development. It may also have long-term health advantages, such as lowering the chance of obesity and overweight in later life, as well as a lower risk of acquiring non-communicable diseases. Calorie intake and expenditure of energy should be balanced. Total fat should not exceed 30% of total calorie consumption in order to prevent unhealthful weight gain. A healthy diet includes consuming no more than 10% of total calories from free sugars. For further health advantages, a further decrease to less than 5% of total energy consumption is advised. Limiting one's daily salt consumption to fewer than 5 grams (or less than 2 grams of sodium) lowers the risk of hypertension in adults as well as heart disease and stroke. WHO Member States have committed to reducing the global population's salt consumption by thirty percent by the year 2025. They have also committed to stopping the growth in adult and teenage obesity and diabetes, as well as childhood overweight, by the same year [15-19].

3. The purchasing habits of consumers for food: The economic success of processed foods is contingent upon consumer acceptance of novel food technology and processing techniques. In the event that food goods fail to satisfy the demands and preferences of consumers, producers are unlikely to get sufficient financial returns. Although the purchase habits of consumers with regard to food are particularly complicated, several hypotheses have been proposed in an effort to explain these behaviors. For example, utility theory views consumer behavior as primarily rational [20]. It implies that customers are just thinking about themselves and that decisions are made based on expected results. According to various views, a variety of internal elements, such as the identification of needs, the assessment of available options, the formulation of buy intentions, the act of making a purchase, and the following consumption, influence consumer behavior [21]. The recognition of the significant influence of external influences on consumer purchase decisions has grown since the 1950s. Marketing of products, social justice, and environmental concerns are some of these considerations. Furthermore, the availability and healthfulness of food are not the only factors that determine whether or not customers purchase

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food. It is affected by the interchangeability of components and foods, as well as the ways in which they are prepared and promoted [21].

Social media and earned (news) media do influence customer attitudes and actions around food processing and technology. The turnover rate of modern news cycles is high, and the lifespan of individual articles is brief. Consumer discussions on social media platforms like Facebook, Twitter, and YouTube may significantly affect the foods and brands that customers choose to buy, which can encourage them to make healthier decisions [22].

4. Promoting healthy diets: Individual eating habits are shaped by the intricate interactions of several social and economic factors that impact nutrition throughout time. These variables include one's income, the cost of food (which influences the accessibility and cost of healthful meals), personal preferences and beliefs, cultural customs, location, and environmental factors (such as climate change). Consequently, the government, as well as the public and commercial sectors, must work together to create a healthy food environment, which includes food systems that support a varied, balanced, and nutritious diet.

In order to encourage individuals to adopt and stick to good eating habits, governments play a crucial role in fostering a healthy food environment. The following are effective measures that policymakers may take to establish a healthy food environment:

- Increasing incentives for producers and retailers to grow, use and sell fresh fruit and vegetables;
- Reducing incentives for the food industry to continue or increase production of processed foods containing high levels of saturated fats, trans-fats, free sugars and salt/sodium;
- Encouraging reformulation of food products to reduce the contents of saturated fats, trans-fats, free sugars and salt/sodium, with the goal of eliminating industrially-produced trans-fats;
- Implementing the WHO recommendations on the marketing of foods and non-alcoholic beverages to children;
- Establishing standards to foster healthy dietary practices through ensuring the availability of healthy, nutritious, safe and affordable foods in pre-schools, schools, other public institutions and the workplace;

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- Urging international, domestic, and regional food services and catering establishments to enhance the nutritional value of their offerings, guaranteeing the accessibility and cost-effectiveness of healthful options, and to evaluate serving sizes and costs.
- Promoting consumer awareness of a healthy diet;
- Developing school policies and programmes that encourage children to adopt and maintain a healthy diet;
- Educating children, adolescents and adults about nutrition and healthy dietary practices;
- Encouraging culinary skills, including in children through schools;
- Supporting point-of-sale information, including through nutrition labelling that ensures accurate, standardized and comprehensible information on nutrient contents in foods (in line with the Codex Alimentarius Commission guidelines), with the addition of front-of-pack labelling to facilitate consumer understanding; and
- Providing nutrition and dietary counselling at primary health-care facilities.

5. Consuming processed foods and its impact on health: An essential part of the food supply is processed foods. Few would contest the fact that improved milk safety through pasteurization, improved meat safety through refrigeration and cooking, year-round availability of seasonal fruits and vegetables through freezing, canning, and preservation, and increased bioavailability of macronutrients like starch from processing grains to flour and subsequently incorporation into breads have all contributed to nutritional security and society. But there are also processed foods that offer unhealthy eating alternatives to the customer since they are heavy in fat, sugar, refined starch, and salt [23]. Data on Americans' food intake from the National Health and Nutrition Examination Survey (2003–2008) revealed that a higher percentage of dietary fiber, vitamin B12, calcium, potassium, and vitamin D were found in minimally processed foods (such as cleaned and packaged fruits and vegetables), which accounted for approximately 14% of total dietary energy. About 57% of the overall energy consumption came from processed foods, along with greater percentages of iron, folate, salt, and added sugars. The second dietary source was food from eating establishments, which accounted for around 29% of total calorie intake but had greater levels of added sugars and salt [23].

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It has been determined that there would be 14,235 fewer heart attacks in the United Kingdom if the consumption of ultra-processed food was cut in half and substituted with minimally processed foods and culinary components. The population's health benefits from the fortification and enrichment of foods during processing. Correcting for iodine deficiency can avoid endemic brain damage, goitre, and cretinism. This is the basis for the iodine fortification of salt, which has a significant influence on the prevalence of these disorders. Iodine insufficiency was significantly decreased with the advent of commercially produced iodized salt in the middle of the 20th century [24, 25].

6. Traditional foods in nutrition: For thousands of years, traditional foods—including those that have been consumed locally and regionally for a lengthy period of time—played a significant part in the traditions of many civilizations and areas. A nation's or a region's folklore includes recipes for traditional meals. Many of the traditional foods that have been around for a long time can still be included in a healthy diet today, while others may not be able to satisfy the nutritional demands of modern diets due to their high fat or energy content. Therefore, it makes sense to adjust certain traditional meals' nutritional profile to make them more suitable for modern eating. The Mediterranean diet, which has been demonstrated to be healthy in the past, might serve as a model for changing unfavorable component combinations in some traditional dishes and promote the use of regional products. Therefore, it is challenging to make broad generalizations on the health advantages of a particular cuisine or the typical foods that go along with it. Food availability locally as well as the cultural and social context affect dietary patterns, yet new habits are increasingly being transferred and assimilated across national boundaries. In contrast to Northern European nations, where fruits and vegetables were consumed in smaller amounts, the diets of Mediterranean inhabitants in the 1960s were marked by a high intake of these items. While Mediterranean-style eating has become more popular in Northern European nations, these significant differences appear to be waning and modern patterns show that communities in the Mediterranean are deviating from their customary dietary preferences. Many traditional meals are in danger of going extinct due to the food market's increased internationalization and globalization.

Not only do traditional meals represent culture, but they often provide essential nutrients as well. These foods support general health and wellbeing because they are high in dietary fiber, vitamins, minerals, and antioxidants. Furthermore, adherence to traditional diets has been

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linked to a lower chance of developing chronic illnesses like obesity, diabetes, and heart disease. We can encourage better eating habits and avert diet-related health issues by include traditional foods in contemporary diets. Tshikororo et al.'s [26] study concentrated on determining the nutritional value of 10 wild, native vegetables that the Basotho people of southern Africa frequently ate. Lepidium africanum, Erucastrum austroafricanum, Solanum nigrum, Asclepias multicaulis, Sonchus dregeanus, S. integrifolius, S. nanus, Rorippa fluviatilis, Tribulus terrestris, and Urtica lobulata were the veggies in question. The goal of the study was to close any information gaps about these veggies' nutritional content. The results showed that several of these wild vegetables, such A. multicaulis and S. dregeanus, are similar to marketed veggies in that they are high in protein and other important nutrients. Furthermore, it was discovered that all of the investigated wild vegetables had minimal lead, copper, and cadmium concentrations, indicating their safety for ingestion. Native Americans who lead traditional lives typically include a variety of plants, including green vegetables and wild fruits, in their meal plans. They derive benefits from these plants' nutritional and therapeutic qualities. This dual use is a problem since it frequently makes it difficult to distinguish between traditional meals and traditional treatments. Anwar et al.'s research [27] concentrated on learning about the customs and traditional knowledge of the indigenous people living in Bahawalpur and the surrounding areas of Pakistan. In particular, it addressed the usage of food and ethno-medical wild plants to cure a range of illnesses.

Traditional cuisines depend on native plant and animal breeds and are frequently derived from regional environments. In the face of unanticipated climate change, maintaining traditional food systems aids sustainable agriculture, biodiversity, and endangered species protection. Generation after generation, traditional agricultural methods have emphasized the value of peaceful coexistence with environment to maintain the resilience and productivity of ecosystems. In Central Europe, picking wild mushrooms by hand has a long history and tradition. Because of their many nutritional advantages, mushrooms are a great dietary source. European cuisines have traditionally substituted wild mushrooms for meat due to their comparatively high protein content, especially during times of crisis like pandemics and wars [28].

7. Nutrition practice: Individuals may either control their own nutritional health by making their own dietary choices or they can get personalized assistance. The idea of "self-care"

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acknowledges people's freedom to manage their own life while keeping in mind the obligations that come with it [29]. Firstly, the individual must be able to evaluate their food intake using reliable techniques and evaluate the quality of their diet in light of dietary guidelines and food standards. Secondly, people make individual food choices based on their knowledge of which foods are healthier than others; they may base these decisions on information from food labels or seek guidance from official sources such as national dietary guidelines developed by government health authorities [30].

More detailed information may be available from associated authority bodies like the Heart Foundation for particular issues, such the necessity to address the risk of cardiovascular disease. It all boils down to the necessary translation level, which is based on the healthcare professional's level of specialized nutrition training. A person should speak with a health professional if their illness has an impact on what they eat, and a dietitian may provide more specialized nutrition advice. On a larger scale, communities must take precautions to prevent the emergence of diseases linked to malnutrition and provide a sufficient supply of food. At this level, governments will also be active in the development of public health-related policies, recommendations, and standards intended to safeguard population health. Furthermore, there are several approaches to nutrition promotion. Societies and groups can be formed to promote nutrition in their communities and to share nutrition-related knowledge. For instance, schools can engage in initiatives to encourage healthy food choices, such school canteen policy and fresh food gardens, in addition to providing pupils with basic nutrition instruction based on dietary requirements. Healthcare professionals working in community and public health initiatives can provide these community groups additional support and resources when creating nutrition-promoting initiatives. All age groups, including mother, child, home, and assisted living facilities, may benefit from these services. While maintaining health is always the aim of nutrition, specific knowledge and applications will vary based on requirements and situations.

8. Conclusion: It is anticipated that the digital revolution will open up new possibilities for food processing automation, provenance, and tracking, giving authorities a clear way to keep an eye on population and individual intakes, as well as the morality and security of food production. The introduction of new and improved livestock and crops will help the agriculture sector raise production, and the food processing industry will need to adjust quickly to harness the advantages of these new feedstocks. To comprehend and use nutritional knowledge more

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efficiently, we need to learn more. Our understanding of food and nutrition grows into a network that leads us in new directions and raises ever-more questions along the way. You'll quickly see why nutrition is a topic of ongoing controversy and why being up to date on new findings is essential to making the most of your nutrition studies.

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