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# Consumer Acceptance of Nutrient-Enriched Climate-Smart Foods

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**Abstract**

The transition toward sustainable food systems increasingly requires foods that respond simultaneously to nutritional challenges and environmental pressures. Nutrient-enriched climate-smart foods represent an emerging category in which improvements in nutritional quality are combined with agricultural or food-production practices intended to strengthen climate resilience, improve resource efficiency, or reduce environmental burdens. Although these products may generate benefits at the intersection of human health and sustainability, their success ultimately depends on consumer acceptance. Technical superiority, improved micronutrient content, or environmental performance cannot by themselves ensure repeated purchasing and consumption. Consumers evaluate food through a broader combination of taste, appearance, familiarity, perceived health value, affordability, trust, production information, environmental concern, cultural compatibility, and confidence in claims made on labels. This conceptual review examines the principal factors shaping acceptance of nutrient-enriched climate-smart foods and integrates evidence from the literature on biofortified foods, functional foods, climate-smart products, sustainable foods, sensory evaluation, food labeling, and willingness to pay.

Existing research indicates that nutritional information can strengthen consumer valuation of biofortified foods, while climate awareness can increase interest in climate-smart products. At the same time, sensory quality remains a decisive condition for adoption, particularly when enrichment changes familiar attributes such as color, texture, flavor, or appearance. The paper argues that the strongest market proposition is therefore not a product marketed only as nutritious or only as environmentally responsible, but one that delivers recognizable sensory quality, credible nutritional benefit, understandable climate value, accessible pricing, and trustworthy verification simultaneously. A consumer-centered acceptance framework is proposed in which sensory assurance and affordability operate as foundational conditions, while nutrition, sustainability communication, trust, familiarity, and social context determine whether initial interest develops into sustained consumption. The paper concludes that future development of climate-smart nutrient-enriched foods should begin with consumer expectations rather than treating acceptance as a final-stage marketing problem.

***Keywords:*** consumer acceptance; climate-smart foods; nutrient-enriched foods; biofortification; sustainable food; functional foods; food choice; sensory quality; consumer trust; willingness to pay

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## 1. Introduction

Food systems are increasingly expected to meet several objectives at the same time. They must provide adequate nutrition to growing populations, remain economically accessible, function under changing climatic conditions, use natural resources responsibly, and respond to environmental pressures associated with agricultural production. These expectations have encouraged greater attention to food innovations that connect nutritional improvement with sustainability rather than approaching the two goals independently.

Nutrient enrichment may occur through biofortification, crop breeding, food fortification, reformulation, incorporation of nutrient-dense ingredients, or other scientifically appropriate approaches. Climate-smart characteristics may arise from agricultural practices designed to improve resilience, resource efficiency, adaptation, or environmental performance. When these dimensions are combined, a food can theoretically offer both a direct nutritional benefit to the consumer and a wider sustainability benefit associated with its production system.

The existence of such benefits, however, does not automatically create consumer demand. Food is fundamentally an experience product. Consumers rarely purchase food solely because of its agronomic history or nutrient composition. Everyday food choices are influenced by sensory expectations, habit, culture, convenience, household budgets, familiarity, perceived safety, health beliefs, trust in information, retailer availability, brand reputation, social influence, and personal values.

This distinction is particularly important for nutrient-enriched foods because nutritional improvement may sometimes alter visible or sensory characteristics. Research on zinc-biofortified wheat in Pakistan, for example, demonstrated that consumers evaluated appearance, taste, texture, and aroma differently and that sensory characteristics played an important role in willingness to consider replacing conventional wheat with biofortified alternatives. More recent work on biofortified pearl millet similarly indicates that nutritional enhancement cannot compensate automatically for weak sensory acceptance; product liking improved when nutrient-rich material was combined with cultivars that generated more desirable sensory qualities.

A comparable challenge exists on the sustainability side. Consumers may support environmental protection in principle but still prioritize taste, price, quality, convenience, and familiarity when making actual food-purchasing decisions. Sustainability information can influence perceived product value, but research shows that its effect may interact with taste expectations rather than functioning independently. Grunert and colleagues found that sustainability information affected willingness to pay for bird-friendly coffee partly through changes in taste perception and moral satisfaction, illustrating that environmental information and sensory experience can become psychologically interconnected.

Climate-smart foods therefore occupy an interesting but demanding market position. Consumers are effectively being asked to evaluate a product with two relatively complex value propositions: nutritional enhancement and climate-related benefit. If either proposition is poorly explained, difficult to verify, associated with an excessive price premium, or accompanied by undesirable sensory differences, acceptance may weaken.

Predieri and colleagues investigated consumer interest in products derived from climate-smart agriculture and found differences between consumer groups, including a segment more strongly motivated by environmental and ethical concerns and another more influenced by economic

considerations. Their findings demonstrate that the potential market for climate-smart foods is heterogeneous rather than uniform.

The central argument of the present paper is consequently that acceptance of nutrient-enriched climate-smart foods should be understood as a multidimensional consumer judgment. Nutrition and climate performance create potential value, but the consumer must be able to recognize, believe, afford, experience, and repeatedly choose that value.

This paper develops a theory-oriented synthesis of those determinants without presenting invented survey respondents or fabricated experimental findings. It examines how sensory quality, nutritional value, environmental positioning, price, trust, familiarity, labeling, and consumer heterogeneity interact and proposes a consumer-centered framework for the development and commercialization of dual-benefit foods.

## 2. Conceptual and Literature Background

Consumer acceptance extends beyond an individual's initial willingness to try a product. A food innovation may attract attention because of novelty or health claims but still fail to achieve regular consumption. For this reason, meaningful acceptance should include positive expectations before purchase, willingness to try, satisfactory consumption experience, willingness to repurchase, and the eventual possibility of incorporating the food into habitual diets.

Research on novel foods consistently shows that consumer adoption depends on multiple interacting influences rather than a single product characteristic. An extensive review published in *Foods* in 2020 identifies sensory perception, perceived naturalness, familiarity, risk perception, trust, individual characteristics, and information among the determinants relevant to acceptance of novel food products.

For nutrient-enriched climate-smart foods, these determinants can be grouped conceptually into product experience, perceived personal benefit, perceived societal benefit, economic accessibility, and information credibility.

The first and most immediate dimension is sensory quality. Consumers consume nutrients through foods, but they experience those foods through taste, aroma, texture, color, appearance, and mouthfeel. Nutritional enhancement that creates an unfamiliar color, strong aftertaste, undesirable hardness, different cooking behavior, or altered texture can introduce a psychological cost even when health advantages are scientifically meaningful.

Rizwan and colleagues' study of zinc-biofortified wheat provides an instructive example. Respondents showed meaningful acceptance of biofortified wheat, but their evaluations varied across appearance, taste, texture, and aroma. Conventional wheat retained advantages for some familiar sensory properties, demonstrating that acceptance cannot be inferred from nutrient content alone.

Hamid and colleagues reached a related conclusion in their 2025 investigation of biofortified pearl millet porridge. The nutrient-enriched cultivar used alone received weaker sensory acceptance than some blended formulations, leading the researchers to emphasize early integration of sensory evaluation into biofortification programs. This is highly relevant to climate-smart food innovation: consumer testing should influence breeding and product design before commercial launch rather than being used merely to assess a finished product.

The second major component of acceptance is perceived nutritional benefit. Consumers must understand what has been enriched, why the nutrient matters, and how the product differs meaningfully from familiar alternatives. Technical statements that are scientifically correct but difficult to understand may have limited behavioral influence.

Evidence from biofortification research suggests that nutrition communication can significantly influence consumer valuation. Birol and colleagues' synthesis of studies on biofortified foods found that providing consumers with information about nutritional benefits generally increased acceptance and willingness to pay. Later socio-economic research reviewing the development and scaling of biofortified crops similarly concluded that information about health benefits tended to strengthen valuation of biofortified foods.

Wangithi and colleagues' study of orange-fleshed sweet-potato puree products in Nairobi provides a practical illustration. Consumers demonstrated high willingness to accept these products, while nutritional information, product knowledge, income, education, age, gender, and reference prices influenced willingness to pay. The study also identified availability and lack of knowledge about where to purchase products as practical barriers.The implication is significant. A nutrient-enriched food can possess genuine nutritional superiority but remain behaviorally weak if consumers cannot recognize that superiority or access the product conveniently.

The third dimension concerns climate and sustainability value. Climate-smart production attributes are generally less visible to consumers than physical attributes such as size, freshness, color, or packaging. Consumers cannot normally determine by inspection whether a crop was produced with climate-adaptive practices, improved water management, lower environmental impact, or resource-efficient technologies. These qualities are therefore largely credence attributes: consumers depend on information, certification, traceability, institutional credibility, or trusted labeling.

Predieri and colleagues' study of Italian consumers showed that concern about climate risks and environmental and ethical values can support stronger interest in climate-smart foods, while another consumer segment remained more economically oriented. This suggests that climate positioning is valuable but cannot be communicated identically to all consumers.

Consumers who are strongly environmentally engaged may respond positively to explanations of water savings, resilient farming, biodiversity protection, reduced input requirements, lower emissions, or improved adaptation. Consumers primarily concerned with household budgets may respond more strongly when climate-smart production is associated with food security, price stability, local resilience, reduced wastage, or dependable supply.

An effective climate-smart claim therefore needs to answer a basic consumer question: What does this environmental characteristic mean for me, my family, my community, or the future availability of food?The fourth determinant is the interaction between health and sustainability. Traditionally, functional-food marketing has emphasized personal benefits such as improved nutrient intake, while sustainable-food marketing has emphasized environmental or ethical benefits. Nutrient-enriched climate-smart foods combine private and collective value within the same product.

Uliano and colleagues studied consumer preferences for functional and sustainable snack bars and demonstrated that consumers can value products offering both health and sustainability characteristics. Their study specifically addressed willingness to pay for products combining

antioxidant-related functional value with sustainable production.The dual-benefit proposition may be particularly powerful because it reduces the psychological trade-off between choosing food that is "good for me" and food that is "better for the environment." Nevertheless, combining claims can also create information overload. Packages covered with nutrient statements, carbon claims, climate terminology, certifications, ethical claims, farming information, and technical symbols may become difficult to interpret.

Trust can emerge through recognized standards, credible scientific explanations, transparent sourcing, traceability, independent verification, familiar institutions, responsible retailers, and consistent product quality. Trust also develops over repeated experience. A first purchase may be driven by a label; a repeat purchase is more likely when the sensory experience confirms the promise.The sixth dimension is price. Consumers may value health and sustainability but still operate under strict household budgets. A nutrient-enriched climate-smart food positioned exclusively as a premium lifestyle product can therefore exclude consumers who might receive the greatest nutritional benefit.

The Nairobi study of orange-fleshed sweet-potato products demonstrated that income, reference prices, nutritional information, and awareness were related to consumer willingness to pay. Similarly, Predieri and colleagues identified economic considerations as an important basis of segmentation in climate-smart food acceptance.Affordability should therefore be treated as part of product design rather than only as a downstream pricing decision.

**Table 1: Core Drivers of Consumer Acceptance**

| Acceptance Dimension | Consumer Interpretation | Likely Positive Influence | Major Acceptance Risk |
|---|---|---|---|
| Sensory quality | “Will I enjoy eating it?” | Familiar taste, texture and appearance | Nutritional improvement accompanied by undesirable sensory change |
| Nutritional benefit | “Is it meaningfully healthier?” | Clear and credible nutrient advantage | Technical or exaggerated health communication |
| Climate value | “Does its production make a real difference?” | Understandable and verifiable environmental benefit | Vague sustainability claims |
| Trust | “Can I believe the information?” | Transparent sourcing and credible verification | Greenwashing or confusing labels |
| Price | “Is the additional value worth the cost?” | Affordable pricing or reasonable premium | Premium beyond household willingness or ability to pay |
| Familiarity | “Does this fit my normal food habits?” | Familiar recipes and product forms | Excessive novelty |
| Availability | “Can I buy it conveniently?” | Reliable retail and local availability | Limited distribution |

Source: Conceptual synthesis based on the reviewed consumer-acceptance, biofortification, functional-food, and climate-smart-food literature.

## 3. Research Gap, Objectives and Conceptual Method

A substantial literature exists on consumer acceptance of biofortified foods. Another body of research examines functional foods and products carrying health benefits. A separate sustainability literature investigates organic, low-carbon, environmentally friendly, biodiversity-friendly, certified, and climate-related food choices.

The literature connecting these domains is comparatively less developed. Research frequently asks whether consumers value enhanced nutrition or whether they value sustainable production, while fewer studies explicitly examine products designed to provide both benefits simultaneously. Uliano and colleagues' work on sustainable functional snack bars is an important example of research beginning to address this combination.

A second gap concerns the tendency to treat willingness to pay as equivalent to acceptance. A positive stated willingness to pay does not necessarily mean that a consumer will repeatedly purchase, prepare, eat, and recommend a product. Acceptance is better understood as a sequence beginning with awareness and extending through trial, sensory experience, repurchase, and habitual use.

A third gap is the insufficient integration of sensory quality into sustainability narratives. Consumers may endorse sustainable agriculture abstractly but reject a sustainable product that tastes inferior. Grunert and colleagues' research demonstrates that sustainability information and taste perception can influence one another, highlighting the need to integrate sensory and sustainability research rather than studying them as completely separate processes.

A fourth gap concerns credibility. Nutritional and environmental improvements are difficult to evaluate visually. Consumers depend strongly on claims, labels, and trusted institutions, yet excessive information can make the combined value proposition harder rather than easier to understand.

Accordingly, the objective of this conceptual study is to integrate existing evidence into a consumer-centered explanation of acceptance of nutrient-enriched climate-smart foods. Particular attention is given to how sensory quality, nutrition, environmental concern, affordability, familiarity, information, trust, and consumer heterogeneity interact.

The methodological approach is a theory-oriented narrative synthesis of scholarly literature relating to climate-smart food acceptance, biofortified-food adoption, functional foods, sensory evaluation, sustainability information, consumer trust, and willingness to pay. The paper does not claim systematic-review exhaustiveness and does not present primary consumer data.

For future empirical validation, the conceptual model could be examined through an appropriately sampled consumer study.

**Five core questionnaire items are proposed:**

- I would be willing to try a familiar food if it offered a verified improvement in nutritional value.
- I would be more willing to purchase the product if its climate-related production benefits were clearly explained.
- Taste and sensory quality would remain important to me even when the product offers nutritional and environmental benefits.

- I would trust nutrient and climate-smart claims more when they are independently verified and clearly labeled.
- I would consider purchasing the product regularly if its price remained reasonably close to comparable conventional foods.

These questions are proposed for future research only and were not administered for the present conceptual paper.

**4. Theoretical Analysis and Discussion**

The literature supports a layered interpretation of consumer acceptance.

At the first layer is sensory permission. Before nutrition or climate value can generate sustained adoption, the product must satisfy basic expectations of palatability and usability. Consumers may tolerate modest sensory differences if they perceive meaningful health or ethical benefits, but a large sensory sacrifice is unlikely to be sustainable in ordinary consumption.This explains why biofortification programs increasingly recognize sensory testing as part of product development. The 2025 research on biofortified pearl millet concluded that nutritional enrichment alone was insufficient to guarantee preference and that combining nutritional improvement with desirable sensory traits was essential for broader adoption.

The second layer is personal relevance. Nutritional benefits need to be translated into something consumers perceive as relevant to their lives. A label stating that a product contains enhanced zinc, iron, vitamin A, protein, fiber, or antioxidants may attract attention, but the value becomes stronger when consumers understand why that nutrient matters.Evidence from biofortification research indicates that health and nutrition information can improve consumer valuation. However, communication should remain scientifically responsible. Nutrient enrichment should not be marketed through unsupported disease-treatment promises.

The third layer is environmental meaning. The term "climate-smart" may be familiar to agricultural scientists while remaining abstract to ordinary buyers. Environmental communication becomes stronger when it relates climate-smart production to understandable outcomes such as efficient water use, farming resilience, soil stewardship, lower resource intensity, reduced waste, or responsible production.Predieri and colleagues' climate-smart food study is particularly important because it demonstrates that consumers differ in the priority they assign to economic, environmental, and ethical considerations. A universal marketing message is therefore unlikely to be optimal.

The fourth layer is trust conversion. Consumers cannot easily test whether the environmental statement on a package is true or whether the nutrient increase is nutritionally meaningful. Trust converts invisible product characteristics into believable value.This suggests that a climate-smart nutrient-enriched label should be specific rather than promotional. Statements such as "environmentally friendly" or "good for the planet" provide limited information if the underlying practice is not explained. Likewise, vague statements such as "super nutritious" are less informative than appropriately substantiated nutrient information.

The fifth layer is economic permission. Consumers may believe and appreciate all stated benefits but still reject the product if the price difference is too high. This is particularly important when nutrient-enriched foods are intended to address nutritional deficiencies among economically constrained

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populations.A socially meaningful climate-smart food strategy should therefore avoid creating a situation in which environmental and nutritional innovation becomes accessible primarily to affluent consumers.

The sixth layer is habit compatibility. Foods consumed frequently are embedded in cooking routines, family expectations, local recipes, cultural meanings, and convenience patterns. Biofortified ingredients may obtain greater acceptance when incorporated into recognizable breads, porridges, chapatis, snack products, or other familiar foods rather than requiring consumers to adopt entirely new eating behaviors.

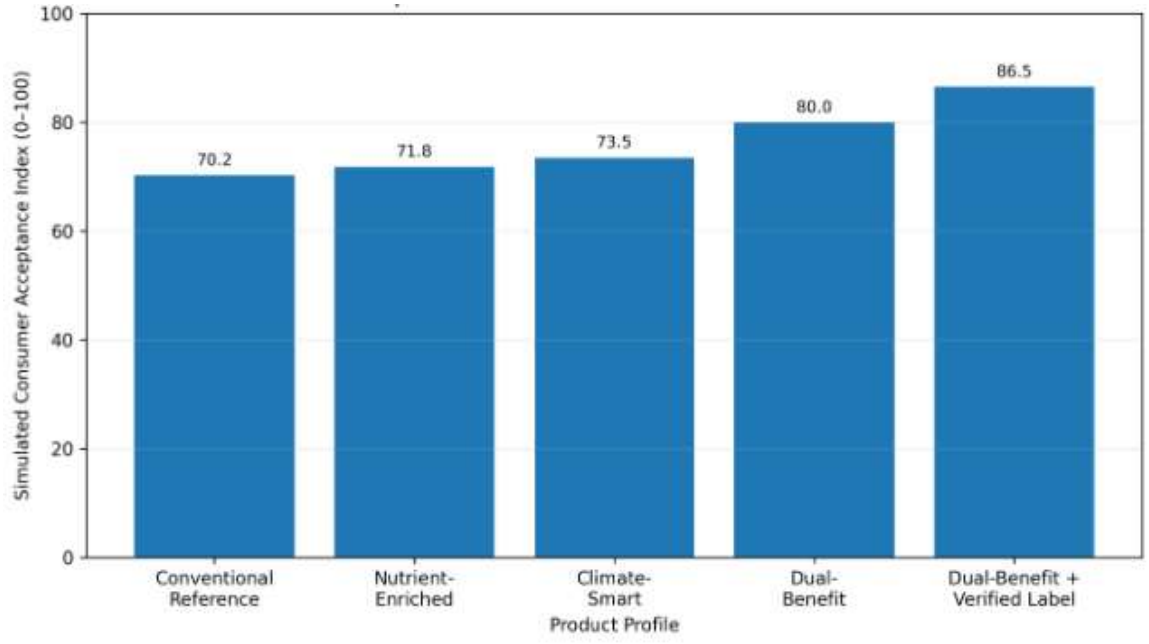
The study of orange-fleshed sweet-potato puree products in Nairobi is relevant here because the ingredient was incorporated into familiar products such as bread, buns, and chapati. The research reported high willingness to accept the products after consumers received relevant information, while availability remained an important practical barrier.From these findings, a theoretical acceptance pathway can be proposed:

awareness → understanding → trust → willingness to try → positive sensory experience → perceived value → repurchase → habitual acceptance.

Failure can occur at any point. A consumer may never become aware of the product. They may see it but not understand the claim. They may understand the claim but distrust it. They may trust the claim but consider the price excessive. They may purchase once but dislike the taste. They may enjoy the food but be unable to find it regularly.

Acceptance should consequently be treated as a system rather than a single attitude.The interaction between nutrition and climate positioning is especially important. Marketing a product only as nutrient-enriched may attract health-oriented consumers while leaving environmental value undercommunicated. Marketing it only as climate-smart may fail to create an immediate personal benefit for consumers who do not prioritize climate concerns.

**Graph 1: Illustrative Consumer Acceptance Profile for Combined Product Attributes**



**Note:** The graph is a conceptual illustration rather than the result of a consumer survey. The values are synthetic and are included only to visualize the theoretical expectation that combined nutritional and climate value may become more attractive when supported by credible verification.

The graph should not be interpreted as evidence that exactly 86.5% of consumers would accept a verified dual-benefit product. Its purpose is conceptual: nutrient information and climate information may each add value, but the literature suggests that greater acceptance is more plausible when benefits are combined with credibility, sensory assurance, and understandable labeling. Research on sustainable functional foods supports the potential attractiveness of combining health and environmental value, while studies of sustainability information demonstrate that the effect of such information interacts with product experience.

An additional issue is consumer segmentation. Health-conscious consumers may prioritize nutrient density. Environmentally concerned consumers may respond more strongly to climate claims. Parents may emphasize nutritional suitability for household members. Price-sensitive consumers may require tangible affordability. Older or more tradition-oriented consumers may place greater value on familiarity. Younger consumers may show greater openness to novel sustainability communication but may still remain strongly sensitive to taste and convenience.

Segmentation should therefore be used to adapt communication rather than to alter the scientific truth of the product. The nutrient composition and environmental performance should remain consistently represented, but the way those benefits are explained can respond to different consumer priorities.Packaging represents an important communication interface. An effective front-of-pack system should provide enough information to support rapid decision making while allowing additional details to be accessed by consumers who want them. Recent research continues to examine integrated approaches that communicate health and sustainability dimensions together, reflecting increasing interest in helping consumers evaluate both considerations during food selection.

Digital traceability can complement rather than overcrowd physical labels. A package may communicate the essential nutrient and verified production message, while a QR code or associated digital platform provides information about sourcing, farming methods, verification criteria, nutritional composition, and responsible production.However, digital tools should supplement clear labeling rather than making critical information accessible only to technologically confident consumers.

The concept of climate-smart nutrient enrichment also has implications before food reaches the consumer. Breeders, agricultural scientists, food technologists, sensory scientists, nutritionists, marketing researchers, retailers, and consumers should not operate in isolated stages.If breeders select only for nutrient density and agronomic resilience but ignore taste and cooking quality, consumer adoption can suffer. If food processors optimize sensory quality but use unclear sustainability claims, trust can weaken. If marketers create attractive environmental narratives unsupported by credible evidence, greenwashing concerns can arise.

## 5. Implications, Limitations and Future Research

For food producers, the central implication is that nutrient enrichment and climate-smart production should be developed as consumer-facing value only after basic product quality has been secured. Taste should not be sacrificed with the expectation that a sustainability claim will compensate for it.

For agricultural researchers, sensory and consumer testing should begin earlier in breeding and crop-development programs. Recent biofortification research supports this principle by demonstrating that consumer preference can differ substantially between nutrient-enriched cultivars and blended formulations.

For marketers, communication should remain simple enough to understand and specific enough to trust. Health-oriented consumers need credible nutritional explanations, while climate-oriented consumers need transparent environmental information. Consumers should not be expected to understand specialist agricultural terminology in order to make a routine food purchase.

For retailers, availability is an important component of acceptance. A consumer cannot develop habitual use of a food that is distributed inconsistently. Research on orange-fleshed sweet-potato products identified lack of knowledge about where to buy them and market availability as practical barriers despite substantial stated acceptance.

For policymakers, consumer protection and credible labeling are important. If climate-smart terminology becomes widely used without clear evidence standards, consumer confidence may weaken. Environmental and nutrition claims should therefore be scientifically defensible, understandable, and consistent with applicable food-labeling requirements.

The paper has several limitations. It is conceptual rather than empirical and therefore does not claim measured acceptance for a particular food, country, or consumer population. The literature combines evidence from different product categories and cultural contexts, meaning that consumer responses observed for wheat, millet, sweet potato, coffee, or snack bars cannot automatically be transferred quantitatively to another food.

The term climate-smart food also covers heterogeneous agricultural practices. Consumer acceptance may vary depending on whether the claimed benefit concerns water efficiency, reduced emissions, resilience, soil management, biodiversity, local production, renewable energy, or another environmental characteristic.

Future research should therefore test specific products with clearly defined climate-smart and nutritional attributes. Experimental work could compare conventional products, nutrient-enriched versions, climate-smart versions, and combined nutrient-enriched climate-smart versions while controlling sensory properties and price.

Field studies should also examine the difference between stated willingness to purchase and actual repeated purchasing behavior. Longitudinal retail or household studies would provide stronger evidence of durable acceptance than one-time intention measures.

Cross-cultural research is equally important. Food familiarity, traditional recipes, trust in institutions, income conditions, environmental awareness, and nutritional priorities differ substantially among populations. A product accepted strongly in one region may encounter resistance in another.

Further investigation is also needed into the optimal amount of information. Too little information can make benefits invisible, while excessive information can create confusion. The challenge is to design communication that makes nutrition and climate performance simultaneously understandable without turning everyday food packaging into a technical report.

Finally, future research should consider equity. Nutrient-enriched climate-smart foods have particularly strong social relevance when they can support communities facing both nutritional

vulnerability and climate-related agricultural risk. Their contribution will be limited if higher production or verification costs make them inaccessible to those populations.

## 6. Conclusion

Consumer acceptance of nutrient-enriched climate-smart foods cannot be explained by nutritional value or environmental performance alone.

The evidence reviewed in this paper indicates that consumers evaluate innovative foods through a wider combination of sensory quality, health relevance, familiarity, price, trust, environmental awareness, labeling, convenience, cultural compatibility, and availability. Nutritional information can strengthen the perceived value of biofortified products, while climate concern can increase interest in climate-smart foods. Yet neither benefit eliminates the importance of taste and everyday affordability.

The most important theoretical conclusion is therefore that consumer acceptance is conditional.

A nutrient-enriched product must still taste acceptable. A climate-smart product must still be affordable. A scientifically superior product must still be understandable. An environmental claim must still be credible. A positively evaluated food must still be available when the consumer wishes to buy it.

Nutrient-enriched climate-smart foods have the potential to connect two important objectives: improved human nutrition and more sustainable, climate-resilient food production. Their market success, however, will depend on whether those system-level benefits are converted into consumer-level value.

The development process should consequently begin with a simple principle: consumers should not be asked to choose between health, sustainability, affordability, and eating quality. The long-term opportunity lies in designing foods in which these dimensions reinforce rather than compete with one another.

When nutritional enrichment is combined with desirable sensory characteristics, understandable climate benefits, credible verification, cultural familiarity, reliable availability, and acceptable pricing, climate-smart food innovation has a stronger foundation for progressing from technological possibility to routine consumption.

## 7. Declarations

**Conflict of Interest:** The author declares no conflict of interest.

**Funding:** No external funding is claimed for this conceptual manuscript.

**Ethics Statement:** This paper is based on conceptual and published-literature analysis and does not report a newly conducted study involving human participants or animals. Human-subject ethics approval is therefore not applicable to the present manuscript.

**Data Availability:** No primary empirical dataset was generated or analyzed. The graph included in the paper uses explicitly synthetic illustrative values and should not be interpreted as consumer-survey data.

**Author Information:** The author identity and affiliation shown above are sample manuscript-formatting information and should be replaced by genuine author metadata prior to submission.

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