

Safety, Benefits, and Transparency Are Critical to Consumer Acceptance of Innovative Foods**

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Summary: Innovative foods are in the marketplace and new ones are forthcoming. To obtain consumer acceptance, innovative foods must be safe, they must provide benefits, and there must be transparency. The Food and Drug Administration (FDA), or some similar independent body, must review safety data from the developer and confirm the product's safety. Innovative food developers, and producers and retailers using these ingredients in their products, need to articulate the societal and individual benefits of the technologies they are using and the resulting products containing those ingredients. Traditional on-package and electronic information about innovative foods must be truthful and non-misleading, and it must clearly differentiate the products from foods produced using conventional methods. Without an independent safety determination, an explanation on the benefits of each application, and meaningful transparency, consumers could become suspicious of innovative foods and reject them.

Current realities: Innovative foods will continue to be part of the food supply. Just as society has become increasingly technological, so has our food. Genetically modified (GM) crops have been grown for over 20 years, and ingredients from those crops are estimated to be present in more than 70% of foods in U.S. supermarkets. The Impossible Burger, with its soy leghemoglobin produced with GM yeast, is sold in over 5,000 restaurants in the United States, Hong Kong, Macau, and Singapore. Two gene-edited crops – a high oleic soybean and an herbicide-resistant canola – are grown by U.S. farmers and made into oils used in food production. On the horizon are products such as food proteins produced in algae with induced mutations or lab-grown meat-free gelatin. In the future, foods produced using multiple technologies will be marketed, making product categorization difficult, and presenting transparency, regulatory, and labeling challenges.

Some consumers express concerns about innovative foods. Although ingredients from GM crops are widespread in food, they are not acceptable to some consumers. According to the Pew Research Center, 57% of consumers believed GM foods are unsafe, despite the international consensus that GM crops currently grown in the U.S. are indistinguishable from their conventional counterparts. The absence of a mandatory pre-market approval process at the FDA and the lack of transparency about the development and availability of these foods have contributed to acceptance issues for GM foods and could pose similar problems for other new technologies. Consumers are bombarded with inaccurate information in the marketplace and on the internet about alleged hazards of different foods. Similar campaigns may be expected for the next generation of innovative foods.

The current food marketplace contains many differentiated products. Today's food manufacturers differentiate and distinguish their products to satisfy consumer demand for safe, nutritious, sustainably produced food. Products are labeled organic, non-GMO, gluten-free, healthy, simple, natural, and many others. Some product claims are overseen by the government (e.g., organic), some by private certifiers (e.g., Non-GMO Project), while others are indirectly regulated through court cases (e.g., determining when products labeled "natural" are misleading). As technologies enter the marketplace, the government, private certifiers, and courts will determine which products can carry a particular label claim. For example, the Non-GMO Project has prohibited gene-edited foods and ingredients from qualifying for their certification. The National Organic Standards Board voted in 2016 to prohibit gene-editing in organic agriculture, and some organic bodies advocate that crop varieties produced using conventional "mutagenesis" techniques (e.g., using chemicals

or irradiation) also be excluded. At the same time, companies producing innovative foods will want to distinguish these foods, arguing to consumers that they provide a nutritional or sustainability benefit that deserves a premium price. The proliferation of product claims likely will bring more consumer confusion rather than clarity, and the lack of clarity will be an impediment for innovative products.

There will be regulatory asymmetry for innovative foods across countries. In most countries, GM foods and ingredients require mandatory pre-market approval before they are grown, sold, and eaten by humans or animals. The regulatory landscape for gene-edited crops varies by country, with some countries exempting certain gene-edited products from oversight and other countries requiring pre-market approval applying GM regulations.

For innovative foods, the regulatory landscape may be unclear. For example, the Impossible Burger completed the FDA Generally Recognized As Safe (GRAS) process and filed a food coloring application. Innovative food oversight will vary by product, process, and country, and international harmonization is unlikely. There are few proposals for how to rationalize regulatory requirements according to the risk posed by a new ingredient or technology. Unclear regulatory pathways may slow or discourage investment and impact trade, such as requiring segregation from conventional products.

Scientifically credible approaches and challenges: If innovative foods and technologies are to have positive impacts, they must succeed in the marketplace. *To obtain consumer acceptance, innovative foods must be safe, they must provide benefits, and there must be transparency.*

Innovative foods must receive an affirmative safety determination before marketing. The FDA, or some similar independent body, must review safety data from the developer and confirm the product's safety. Given the broad range of innovative foods that have been produced to date and the wide range of possibilities in the future, there will not be a single method for determining safety or a single regulatory process that can be uniformly applied. Yet each product or type of product needs a science- and risk-based evaluation of the risks of both the product, including its ingredients and claims, and its production process before entering the food supply. These evaluations could be done on a product-by-product basis, as is done with GM crops, or carried out for categories of products, as was done for cloned animals. The FDA and similar bodies in other countries need to play an active and independent role in designing, revising, validating, and overseeing those safety determinations.

Once a product is found safe, consumers will embrace it if it is beneficial to them and it reflects their values. Some consumers want foods that are more nutritious, tastier, or have a longer shelf life. Other consumers care that a food was sustainably produced or does not include animal products. Innovative food developers, and producers and retailers using these ingredients in their products, need to articulate the societal and individual benefits of the technologies they are using and the resulting products. This must be done using both traditional (e.g., information on the package) and electronic (e.g., electronic disclosures, social media) methods. If consumers are to embrace innovative foods, they need to understand the reasons for using that technology so they may connect the benefits with the food innovation.

Finally, in today's world—with consumers having access to nearly unlimited amounts of information (some high quality and some not so high quality)—transparency to consumers around innovative foods is essential. That information must be truthful and non-misleading, and it must clearly differentiate the products from foods produced using conventional methods. For example, the Impossible Burger may use the term “burger” if other information on the package (e.g., words

and pictures) makes it clear the product is a plant-based meat substitute. Regulatory agencies must review label information and take necessary actions if the label does not meet legal standards. Without transparency, consumers could become suspicious that innovative ingredients are being hidden from them, resulting in consumer rejection.

Evidence-based options and real-world opportunities: Innovative foods are in the marketplace and new ones are forthcoming. The following actions by developers, food companies, and regulators are needed for consumer acceptance:

- Developers of innovative foods and ingredients need to use a variety of communication tools (e.g., websites, press releases, QR codes, and package labels) to communicate to consumers: (i) why they developed their products; (ii) who benefits from those products and how; and (iii) where their products can be found in the food supply. Developers also need to make publicly available on their websites their safety evaluation of their products and what standards they used.
- Before products are marketed, developers must meet with stakeholders with different perspectives on innovative foods and establish procedures to consider and address the issues raised, including segregation when necessary.
- The FDA and its international counterparts must understand the technologies being used and their potential applications, meet with different stakeholders to understand their safety concerns with potential products, and then establish the necessary tests, analyses, and production procedures needed to ensure those innovative foods are safe.
- The FDA and its international counterparts must work with food companies and developers to ensure there is a safety evaluation before products enter commerce and that the evaluation is publicly available. Those regulatory agencies must independently approve the food's safety based on that evaluation.
- Marketing information and labeling must explain the differences between the novel food and conventional foods so consumers understand there is a difference and can make an informed choice.
- Regulatory agencies must establish national definitions and standards (e.g., "organic") so that product claims are uniform and understood by consumers. They must make sure those labeling standards are complied with.

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