

Issue Report

Food Product Composition, Consumer Health and Public Policy

An enormous number and variety of foods—more than 300,000 products—are available for sale every day in the United States. More than 10,000 new product introductions were added annually throughout the 1990s.

The breadth of choices the U.S. food supply offers consumers can, however, mask similarities in composition resulting from ingredients frequently used in processed foods. Common formulations can have wide-spread effects on the diet quality and health of large sections of the population. As health concerns increase, consideration is needed of how agricultural and food policies may influence the quality of consumer diets through food product composition.

Case studies on sugar, trans fats, dairy, whole grains and salt offer examples of the unintended effects of policy, the effects of

policies directed specifically at improved nutrition, and the role of policy in motivating behavioral change. Ten key observations emerge.

1. Two main types of indirect policies—those affecting input costs and those affecting competition—have influenced recent shifts in food product composition.

Two types of policies are at the heart of recent shifts in food product composition in the United States: policies affecting food manufacturers' input costs and information policy affecting competition. Policies affecting input costs include farm income support programs, commodity price supports, import quotas or tariffs. Information policies include labeling requirements and nutrition education programs. Table 1 provides an overview of product composition shifts affected by public policies.

Table 1. Food Product Composition Change and Public Policy

Composition Shift - documented, hypothesized or targeted	Possible Policy Impetus
Policies Affecting Input or Technology Costs	
Increased use of high fructose corn syrup in processed foods.	Sugar and corn price policies over the past two decades. Sugar quotas.
Increases in low-fat milk consumption and lower-fat Italian cheeses.	Change in 2000 milk marketing order pricing that sets incentives for fat content. Dairy quotas in trade.
Pork and beef have less fat now than 20 years ago.	Grades and standards. Check-off supported research to improve meat quality.
Information Policy	
Reduction of trans fats in processed foods.	Transfat added to mandatory nutrition label in 2003.
Increase in whole grains in processed foods.	Dietary Guidelines in 2005.
Salt content in processed foods.	Mandatory nutrition labeling starting in 1995.
Low-fat product introductions increased in the 1990s.	Dietary Guidelines emphasize moderation in fat consumption. Mandatory nutrition labeling.



2. Policies affecting input costs do not have large effects on retail prices or consumer demand.

Final retail prices and consumer demand are not closely linked to input costs, particularly with highly processed foods. The more processed the food, the lower the percentage of value from the raw commodity. In the case study on sugar and high fructose corn syrup (HFCS), Dr. Helen Jensen and Dr. John Beghin, both of Iowa State University, found that the link between farm and retail prices is not very strong, particularly in recent years. The use of these two substitutes in production is driven by their relative prices, but the use of the cheaper HFCS does not strongly influence the prices of final products or overall consumption of sweeteners.

3. Policy may prevent changes in consumer demand from influencing commodity production and quality.

Conversely, changes in consumer demand may not influence demand for inputs, because policy may prevent such changes from being fully reflected in commodity prices. In the dairy case study, Dr. Brian Gould of the University of Wisconsin, found that dramatic shifts in dairy product demand were not reflected in milk prices, even though milk pricing formulas were changed in 2000 to better reflect market demands. Dairy pricing formulas are complex and have been revised twice in the last decade. At issue is the ability of prices to translate consumer preferences into farm-level incentives. Current pricing formulas do not reflect the contemporary

composition of dairy product demand, specifically the growth in demand for low-fat mozzarella-type cheeses or the development of new uses for whey byproducts. The ability of producers to alter the characteristics of milk has limits, but these have not been tested due to the lack of price incentives. Pricing formulas weakened the link between consumers and producers, so the final mix of food products does not reflect consumer preferences or the most efficient use of producer resources. This tenuous link between commodity price changes and retail prices indicates a limited ability of commodity policy to influence retail price and consumer choice.

4. Policy can influence food composition without first influencing consumer preferences.

The types of food products available for consumption reflect consumer preferences, and the responsiveness of producers and manufacturers to those demands. Yet consumer demand does not drive all changes to the food supply. Consumers may not even be aware of reformulations or processing changes, particularly if taste and price remain unchanged.

Input and processing costs, as well as policies affecting those costs, can play a major role in the content and quality of the final mix of food products. Commodity support programs, tariffs or food safety requirements can affect input prices or production practices, triggering shifts in the content and quality of the food supply. An example is the shift from sugar to high fructose corn syrup (HFCS) in U.S. processed foods. U.S.

corn and sugar farm income and price support programs raised the price of sugar relative to corn, resulting in the development and widespread use of HFCS as a sweetener in processed food products. Another example is the use in processed foods of partially hydrogenated soybean oil to replace saturated fats from animal and tropical oils. While this was partly in response to nutrition information, it also reflects the widespread availability and relatively low cost of soybean oil in the United States.

5. Information policies can create new areas of competition.

Information policies—labeling regulations and nutrition information—can create new areas of competition by raising consumer awareness and stimulating demand for new product attributes. Manufacturers and producers reformulate as early as possible to capture first-mover profits. Information policies stimulate competition for marginal consumers. The more attributes manufacturers can “stack” in their products—eco-friendly, low-sugar, fair-trade, high-fiber—the more niche consumers they can attract. This strategy works best when the new ingredient or attribute does not affect taste or price. Reformulations occur even if many consumers are unconcerned about the health attribute in question. Thus all consumers see a change in diet composition, whether or not they were seeking change.

A case study of the whole grain recommendations in the 2005 Dietary Guidelines for Americans showed that the recommendations triggered an explosion in whole grain products and labeling. This occurred despite the fact that many consumers did not exhibit any desire for more whole grain options or any knowledge of the new recommendations. The study’s author, Lisa Mancino of USDA’s Economic Research Service, estimates that in 2003, U.S. consumers ate 10 servings of grains daily, with whole grains accounting for a little more than one serving.

After the new guidelines were released in 2005, numerous manufacturers changed product formulations and introduced new whole grain products. For example, General Mills began offering regular and “whole grain” versions of their breakfast cereals.

Manufacturers may opt to reformulate as part of a strategy to build brand reputation, including well-advertised investments in new “healthy” ingredients and processes. These strategies are designed to build the brand’s reputation for wholesomeness, healthfulness and social responsibility. Manufacturers may also reformulate and adopt expensive process changes to raise de facto industry quality standards, thus creating effective barriers to entry when other firms find it difficult to meet rising health and quality expectations. Campbell’s investment in salt substitute research and heavy advertising of its low sodium soup line provide one example of these strategies to build brand reputation.

6. Competition over health attributes may not result in healthier foods.

Whole grain and transfat case studies illustrate that substitute ingredients or reformulated products may not be any more healthful than the products they replace. Whole grain reformulations are not regulated, and it is often unclear what “whole grain” claims on food product labels indicate. An effort to develop a private standard for such labels may or may not succeed in providing better information and product formulation to consumers. This demonstrates the limitations of current information policy with respect to this health attribute.

In the case of transfats, potential substitutes are limited to saturated fats in many of the major sources of transfats in the diets—specifically pastries and cookies. Food label data analyzed by Dr. Laurian Unnevehr of the University of Illinois indicate that relatively healthful oil substitutes have been used in chips, while less healthful substitutes, such as palm oil, dominate in reformulated

cookies. Many of the more difficult reformulations will require considerable time and investment to achieve. It is unclear whether reformulation will ultimately result in greater consumption of saturated fats.

While use of front-of-the-package healthy labeling or icons—such as “heart healthy” or “double health checks”—could spur competition over healthy attributes, the ultimate effect on diet quality depends on whether the reformulated product is actually healthier than the one it replaces. Reformulated “healthy products” could produce a halo effect where consumers eat more of the product than is part of a healthy diet. One example is the potential for the “Snackwell Phenomenon” with respect to whole grains or no transfat claims—i.e. consumers think they can eat greater quantities of the food because it is “healthy.”

7. The extent of reformulation depends on the adaptability of production practices, with implications that extend all the way through the supply chain.

The extent to which a food product can be reformulated depends on the ability of existing production practices to accommodate the input or processing change. Policies resulting in large changes in input prices or demand for reformulation could have little short-term effect on product composition if the cost of adapting processing methods to a new input is higher than the projected cost savings.

For example, the whole grain case study noted both farm-level and processing-

level constraints to increased whole grain wheat production. At the farm level, it may take a season or two to shift from red winter wheat to the more palatable white winter wheat. In some areas of the country, such a shift may not be possible. White winter wheat varieties developed for specialized whole grain use in processed products require long-term plant breeding efforts. At the processing level, some machinery cannot handle the corrosiveness of whole grain processing.

Reformulation of products to remove transfats was also hampered by existing capital constraints. Food processing equipment was designed for the texture and stability of the transfat-containing oils; reformulation has meant designing and investing in new equipment. New soybean and canola varieties with more desirable oil characteristics have been developed, speeded by the tools of modern biotechnology. Building up a reliable supply of these new varieties takes time, with a three-year planning horizon required to meet any new source of demand from the food industry.

Another example is how the increased demand for corn for ethanol and higher prices of HFCS may not result in the return to use of sugar as a food ingredient. Manufacturers who invested in high-tech machinery designed to efficiently process HFCS cannot easily change to sugar. Only those producers still using older machinery can switch easily between sugar and HFCS. This rigidity in processes is reflected in a weaker link between farm-level prices of sweetener sources and food product prices, making



price policy an inefficient lever for future reformulation change.

8. Publicly supported agricultural research has played a role in product composition.

Publicly supported research has a significant role in stimulating private investments in product composition change. Breeding programs for low linoleic soybean varieties and white winter wheat varieties drew on previously completed publicly-funded research to identify desired processing characteristics. Development of new uses for whey byproducts, a result of publicly-funded research, brings a new dimension to dairy pricing and returns to milk composition that may offset any reduced market value for fat.

9. Taste determines the success of any change in product composition.

Taste is the 800-lb gorilla in the corner of any discussion of nutrition policy and product reformulation. Manufacturers will not adopt a price-saving input or technology if the final product does not taste good. This is illustrated by the food service industry's search for replacements for partially hydrogenated oils. Fry oils must convey the right taste, texture and mouth-feel. Some substitute oils give a product the right taste, but the product feels greasy. The right fry oil varies for different fast food products. Finding the right blend to meet the needs of particular food service chains is a complex undertaking.

In some cases, even the suggestion that something will not taste good is enough to constrain the development—or advertisement—of a new product. Many consumers dislike the taste of

low-salt products and will systematically avoid purchasing anything so labeled. To avoid this reaction, Campbell Soup Company and Mars have not touted the gradual reduction in salt in the majority of their soup lines.

10. New areas for research.

The complex linkages between agricultural and food policies and long-term health outcomes from diets are a relatively understudied area. Agricultural economists can help address questions for the agricultural and food system, including:

- What kind of packaging icons or other information signals might best succeed in creating market incentives for healthier foods, serve consumer needs and bring about competition for more healthful products?
- How will agricultural and market price policies influence product composition in the future as the links grow weaker between policy and production, on one hand, and between commodity and food prices on the other hand?

- How does market structure influence the impact of policies on diets? Does the importance of the food service industry as a source of calories consumed in the United States argue for its inclusion in policy initiatives?
- How can agricultural commodity research support healthier diets through providing improved nutrition and processing characteristics?
- How can tracking and understanding of food product composition changes be improved? Information used to translate product consumption into dietary components is now maintained by USDA's Agricultural Research Service. This difficult and expensive data transformation is an important foundation for research, but may not be able to keep pace with rapid changes in formulations. One option is an industry/government database to record nutrition label information provided on products, giving researchers a basis for understanding the directions of change in food product reformulation.

The Source

This report was developed from discussions at the April 2007 conference, *Food Product Composition, Consumer Health and Public Policies*. Conference participants explored the role of policy in changing U.S. consumer diets through shifts in food product composition, and how and where policy might be used in the future to improve diets. Farm Foundation and USDA's Economic Research Service (ERS) organized the conference attended by agribusiness leaders, policy makers and researchers. This report was prepared by Elise Golan of ERS, and Laurian Unnevehr of the University of Illinois. Presentations from the conference are posted on the Farm Foundation Web site, www.farmfoundation.org.

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