

CEREALS 17

Cereals 17 Symposium – Food Selection According to Food Processing: Fabulous or Flawed?

Processed and Ultraprocessed Foods Defined— An Alice in Wonderland Question?

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‘When I use a word,’ Humpty Dumpty said, in rather a scornful tone, ‘it means just what I choose it to mean—neither more nor less.’ ‘The question is,’ said Alice, ‘whether you can make words mean so many different things.’ (Lewis Carroll [1832–1898]) (1)

A 2014 IFIC Foundation survey indicates approximately 75% of consumers agree that food processing can help food stay fresh longer, yet only 50% of Americans agree that processed foods can contain nutrients we need for a healthful diet (10). There are many consumer perceptions and regulatory definitions of a “processed food.” However, no regulatory agency has advanced the newer term “ultraprocessed food” that is being promoted by some consumers and advocacy groups. Clearly, what is meant by these terms varies markedly depending on their usage and the user. These terms, as described by the quote from Lewis Carroll, appear to beg Alice’s question as to “whether you can make words mean so many different things”?

The popular criticism of processed foods and use of a processed food categorization, which has its own criteria (e.g., subjectively defined by degree of processing plus other criteria), as a guide to selecting a healthful diet have become contemporary topics of debate. For example, a Google search in April 2017 using the phrase “ultraprocessed food and bad” yielded more than 18.7 million hits. The topic is not restricted to the Internet and popular press, however—public health researchers are also making recommendations to avoid “processed and ultraprocessed foods.” In addition, international public health authorities and health promotion organizations, such as the Pan American Health Organization (part of the FAO/WHO system), are increasingly recommending a NOVA pattern of food selection that is based on processing level to address rising rates of obesity, especially in Latin America.

The definitions and ideas surrounding such categorizations will be discussed during an interactive session at the upcoming [Cereals 17 meeting in San Diego, CA](#) (Tuesday, October 10, 10:30 a.m. to 12:10 p.m.). To tee up the discussion, this first of two “teaser” articles will provide various definitions of processed food and show their extreme incongruence. The second article will introduce the NOVA categorization and some of the data and forces behind it.

Definitions of Processed Food

USDA and DGAC. Two definitions of processed food were discussed and applied in the 2010 *Dietary Guidelines for Americans*. Notably, the U.S. Department of Agriculture (USDA) (16) defines processed food as

Any food other than a raw agricultural commodity, including any raw agricultural commodity that has been subject to washing, cleaning, milling, cutting, chopping, heating, pasteurizing, blanching, cooking, canning, freezing, drying, dehydrating, mixing, packaging, or other procedures that alter the food from its natural state. Processing also may include the addition of other ingredients to the food, such as preservatives, flavors, nutrients, and other food additives or substances approved for use in food products, such as salt, sugars, and fats. Processing of foods, including the addition of ingredients, may reduce, increase, or leave unaffected the nutritional characteristics of raw agricultural commodities.

This is also the definition used by the 2010 Dietary Guidelines Advisory Committee (DGAC) (5). In addition, the 2010 DGAC leveraged the USDA definition of minimally processed foods. “Minimally processed food” refers to a food that is processed but retains most of its inherent physical, chemical, sensory, and nutritional properties. Many minimally processed foods are as nutritious as their unprocessed forms.

Further, Title 7 in the *Code of Federal Regulations* focuses on agriculture regulations and the responsibilities of the USDA. In this case, 7 CFR § 65.220 (15) defines a processed food item as “a covered commodity that has undergone specific processing resulting in a change in the character of the covered commodity, or that has been combined with at least one other covered commodity or other substantive food component.” Specific processing steps that result in a change in the character of the covered commodity include cooking, curing, smoking, and restructuring (15).

FAO. The Food and Agriculture Organization (FAO) of the United Nations has produced many technical publications that refer to food production and food processing (7). FAO defines food preparation and processing as “any change that is made to a food to alter its eating quality or shelf life.” This involves applying scientific and technological principles to preserve foods

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by slowing down or stopping the natural processes of decay and allows changes in the eating quality of foods to be made in a predictable and controlled way. In food processing the creative potential of the processor is used to change basic raw materials into a range of tasty, attractive products that provide interesting variety in consumers' diets.

EFSA. The European Food Safety Authority (EFSA) applies Regulation (EC) No. 178/2002 to "all stages of production, processing and distribution of food and feed. It shall not apply to primary production for private domestic use or to the domestic preparation, handling or storage of food for private domestic consumption." "For the purposes of this Regulation, 'food' (or 'foodstuff') means any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans" (6).

NHS. Like the U.S. definitions, the U.K. National Health Service (NHS) notes that food processing applies to any food that has been altered from its natural state in some way, either for safety reasons or convenience (14).

FSANZ. Similarly, Food Standards Australia New Zealand (FSANZ) defines food processing as the handling of food, which includes the making, manufacturing, producing, collecting, extracting, processing, storing, transporting, delivering, preparing, treating, preserving, packing, cooking, thawing, serving, or displaying of food, as delineated within Standard 3.1.1.1. Subsequently, as defined in Standard 3.2.2, food processing refers to any process involving the substantial transformation of food (e.g., manufacturing or canning) or "activity conducted to prepare food for sale including chopping, cooking, drying, fermenting, heating, pasteurizing, thawing and washing, or a combination of these activities" (8).

IFIC. The International Food Information Council (IFIC) communicates science-based information on health, nutrition, and food safety for the public good. With respect to food processing, IFIC states that this is "any deliberate change in a food that occurs before it's available for us to eat. It can be as simple as freezing or drying food to preserve nutrients and freshness, or as complex as formulating a frozen meal with the right balance of nutrients and ingredients" (9).

Wikipedia. Wikipedia (17), which is a resource that is popular with consumers, defines food processing as

The transformation of raw ingredients, by physical or chemical means into food, or of food into other forms. Food processing combines raw food ingredients to produce marketable food products that can be easily prepared and served by the consumer. Food processing typically involves activities such as mincing and macerating, liquefaction, emulsification, and cooking (such as boiling, broiling, frying, or grilling); pickling, pasteurization, and many other kinds of preservation; and canning or other packaging.

Food Science Textbooks. Recent food science textbook definitions depict processed foods as raw foodstuffs that are changed into intermediate finished, value-added food products produced through the application of labor, energy, and technology in one or more steps (processes) to achieve the desired outcome. Food processing aims to 1) extend the period during which food remains wholesome microbially and biochemically safe to eat; 2) maintain or enhance nutrient amount or availability of the food; 3) remove or inactivate any harmful constituents; and 4) add variety and convenience to the diet (2).

Food Science Journals. The *Journal of Food Processing & Technology* (13) defines food processing as

Food processing is the transformation of raw ingredients, by physical or chemical means into food, or of food into other forms. Food processing combines raw food ingredients to produce marketable food products that can be easily prepared and served by the consumer. Food processing typically involves activities such as mincing and macerating, liquefaction, emulsification, and cooking (such as boiling, broiling, frying, or grilling); pickling, pasteurization, and many other kinds of preservation; and canning or other packaging.

AICR. The American Institute for Cancer Research (AICR) offers additional perspectives on food processing. For example, what does it mean when AICR says we should choose "minimally processed food more often"? AICR defines "minimally processed" as vegetables, grains, and beans that are prepared commercially or at home without large amounts of added fat, salt, or sugar. This means flavoring foods such as brown rice or whole wheat couscous with flavorful herbs rather than using sodium-laden mixes, and using vinegar, lemon juice, garlic, and spices to flavor vegetables instead of high-fat or high-sodium sauces. Minimally processed foods also may be subject to minimal refining, but not so much that it results in significant loss of nutrients and fiber (3).

It should be noted that, although AICR most often refers to plant foods when encouraging consumers to eat more minimally processed foods, avoiding processed meats such as sausage and hot dogs is also good advice, because regular consumption may increase the risk for colon cancer. There are too many variables on this latter point, as advanced by the International Agency for Research on Cancer (IARC), to discuss here.

It is important to note that the results of processing foods are not all bad: canning and cooking (which is technically a "process") by steaming, microwaving, or stir-frying can make certain nutrients easier to absorb by the body and minimize innate toxins such as those found in potatoes and tomatoes. The best option is to choose plant foods such as whole grains, vegetables, fruits, and beans more often and to look for processed foods with little or no added fat, sugar, and sodium (4).

NOVA System. The NOVA system, recently advanced by Monteiro and colleagues (12) at the University of Sao Paulo in Brazil, categorizes formulations of several ingredients that, in addition to salt, sugar, oils, and fats, include food substances not used in culinary preparations, in particular flavors, colors, sweeteners, emulsifiers, and other additives used to imitate the sensorial qualities of unprocessed or minimally processed foods and their culinary preparations or to disguise undesirable qualities of the final product.

Popular Press and Internet. The popular press and a sampling of Internet definitions were reviewed. One example published by the website SF Gate (part of the *San Francisco Chronicle*) (11) states that processed food "usually refers to foods that are packaged in boxes, cans, or bags. These foods need to be processed extensively to be edible and are not found as is in nature. In addition to going through many complex processing steps, processed foods often contain additives, artificial flavorings, and other chemical ingredients."

Summary

In summary, processing foods using washing, cleaning, milling, cutting, chopping, heating, pasteurizing, blanching, cooking, canning, freezing, or drying, either on the farm, in commercial facilities, or in the home creates safe, nutritious food products, while reducing waste and preserving natural resources. In addition, most of the popular definitions associated with some form of food processing do not have any regulatory sanction. They are generally fabricated and then promoted through the popular press and media outlets.

If you like Alice and other consumers and food processors need to fully understand the meaning of food processing and like the White Rabbit are late for a very important date and are wondering which way to go on this topic, do not rely on the Cheshire Cat. Rather, please read and ponder the information in these articles and prepare yourself for a scintillating, and perhaps mind-bending (aka the Caterpillar), discussion on cereal products as processed and ultraprocessed foods at the [Cereals 17 meeting in San Diego, CA](#) (Tuesday, October 10, 10:30 a.m. to 12:10 p.m.).

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