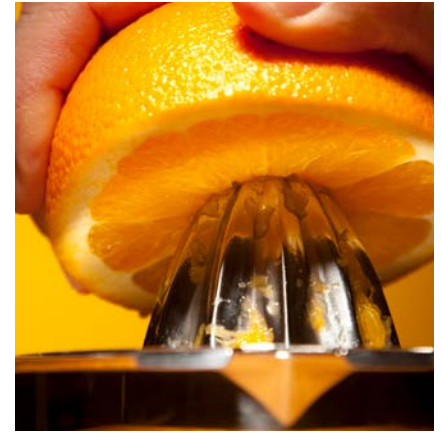# IFT

*feeding the minds
that feed the world*

Get the Facts:
Food Processing

Learn the differences between food processing and processed food and how food processing has helped to make foods more nutritious and decrease waste.

Get Informed About Food Processing

Food processing has occurred since humanity began using fire and tools to cook meats, squeeze fruits for juice, or grind grains for flour. We all use one or more processes in our kitchen to prepare meals whether its cooking eggs and toasting bread, or preparing yeast leavened sweet bread. In fact, much of the effort in making food products for many people globally has been made easier through food processing.

Food processing can be defined as the use of methods and techniques involving equipment, energy, and tools to transform agricultural products such as grains, meats, vegetables, fruits, and milk into food ingredients or finished food products.

Processed food is a related but slightly different term, where a food material has been changed in some way through a combination of ingredients together with processing steps to make the food safe to eat, shelf-stable for future use, convenient to use (e.g., microwaveable dinners), tasty/palatable, (e.g., a milk chocolate bar), and/or more nutritious (e.g., breakfast cereals fortified with vitamins).

While related, the terms food processing and processed food are not completely synonymous. With advancements in science and technology and its application to produce food, has led to a considerable increase in the availability of processed foods. In the last few decades, there has been some criticism and confusion among consumers, health professionals, and others regarding the benefits and detriments associated with the consumption of processed foods. It is important that communications on these topics should differentiate between food processing and processed food, to help people make informed decisions about the food products they purchase and consume.

This tool kit provides helpful fact-based information to assist with communication on these topics. To get more in-depth information about food processing be sure to visit our online toolkit at **iftevent.org/toolkits**

Food Processing ≠ Processed Food

All processed foods use food processing, but not all food processing leads to processed foods.

Food Processing

Defined as the use of equipment and tools to safely and efficiently transform food ingredients like grains, meats, vegetables, or fruits with minimal waste into more **value-added ingredients** or in combination to more convenient processed foods for sale.

Examples of value-added foods/ingredients:

- Flour
- Milk powder
- Liquid eggs
- Frozen vegetables
- Frozen chicken breast
- Cooking oil

Processed Food

A term for a food that has been changed in some way to preserve it for future, more convenient use (e.g., microwaveable dinners), make it more sensorially appealing to consume (e.g., a chocolate bar with sugar and fat added to cocoa powder) or more nutritionally beneficial (e.g., vitamin fortified breakfast cereal).

Examples of processed foods:

- Cheese dips
- Ready to eat cereals
- Potato chips
- Salad mixes
- Packaged lunchmeats
- Baked muffins

Types of Food Processing

There are a wide variety of food processes across a range involving one or a combination of steps (unit operations) that can be done from the scale of a home kitchen to large production factories employing thousands of people.

For example, simple processes include washing, chopping, and cooking vegetables in water or mixing of spices together to make unique flavor blends.

Chopping, Washing, and Cooking Vegetables

Mixing Spices Together

Ultra-High Heated Treated Milk

Key Benefits of **Food Processing**

Food Safety
Food processing systems in the 21st century and the associated safety and quality management tools enable continued delivery of more nutritious and safe food than any time in human history.

Food Preservation and Long Shelf-Life
The use of technologies, such as aseptic and ultra-high temperature food processing allows some food products to be stored unrefrigerated for a longer period of time, for example, high-protein nutrition shak with a shelf-life of 12 months, for older adults.

Year-Round Food Supply

Availability
Another example of advances in food processing is the increasing availability of many regionally grown food products, such as pineapple grown in Hawaii, the Philippines, or Thailand in convenient single-serve plastic packages.

Convenience
Advances in food processing have resulted in the development and widespread availability of convenient food products that require minimal preparation/cooking and ready-to-eat (RTE) food products, some of which are also healthful. For example, whole grain pasta made by cooking, extruding, and drying grain flour, is a shelf-stable product that requires minimal preparation time.

Affordability
Advances in food processing to deliver benefits such as food safety, preservation, shelf-life extension, and/or convenience is often associated with increased costs. However, large-scale processing technologies enable production of cost-effective products for consumers to purchase at grocery stores rather than make it at home from raw ingredients.

Healthy Options
Food processing has helped deliver healthy food options (e.g., plant-based foods, plant-based protein, low-fat meat and dairy products) to assist consumers in following a healthy dietary pattern(s).

How are Organic labeled foods processed differently?

Organic foods are grown in a way that meets a countries' organic requirements, which vary globally.

- Generally, organic products are grown on a farm where most synthetic fertilizers and pesticides have not been used for multiple growing seasons.

- Synthetic fertilizers cannot be used for organic agriculture.

- Except for a few, most synthetic pesticides are not allowed for organic agriculture.

- Naturally-derived pesticides may be used if they are not indicated as prohibited in the National Organic Program's "National List of Allowed and Prohibited Substances."

- Organic products can be produced on the same processing system as a non-organic; however, there are stricter requirements of cleaning the processing equipment before changing from non-organic to organic production.

- Organic foods must always be stored separate from non-organic foods.

- Beyond the farm, organic products must be segregated throughout the food supply chain from non-organic product.

Chemical Free   **Farm Grown**   **Pesticides Free**   **Natural Ingredients**

Does food processing make the food unhealthy?

Not necessarily. Food processing is a tool used to make food safe, nutritious, palatable, convenient, shelf-stable, affordable, and accessible. Like any tool, it can be used properly or improperly, and it is important that its use is regulated and controlled by well-trained people. Some food processing steps like cooking can reduce available nutrients, but the step(s) could also eliminate potential illness causing microorganisms. In some cases, processing can increase the bioavailability of nutrients, for example, lycopene in tomatoes, or decrease negative components like lectins in beans. Food processing can sometimes lead to potentially harmful byproducts, such as acrylamide in fried foods.

Are there misconceptions about food processing?

Food significantly impacts a person's health. It is a common bond that connects us.

Most of us have a fundamental understanding of food processing through our experiences at home (e.g., washing, cooking, grilling, and freezing), but are unfamiliar with the complexities associated with industrial food processing. And so, for many, food processing is a mystery.

Ingredients such as flour, roasted coffee, and cooking oil, and food products like jams, canned vegetables, and ready-to-eat shelf-stable dinners all undergo food processing, but only some are generally considered processed foods and these differences are unknown/unclear to some consumers. Many consumers who roast coffee beans at home would not consider roasted coffee beans as processed food, even though they undergo several processing steps.

Examples of Food Processing Technologies Benefits and Impacts

Thermal Preservation Processes:

Processes that employ heat to make food safe for consumption and/or extend shelf-life by reducing or eliminating microbiological contamination (pathogens or spoilage) and enzymatic activity of the food. These processes could also affect texture and flavor of food products.

Processing Methods	Process Description	Food Use Examples	Used at Home	Benefits	Drawbacks
Cooking/Heating	Increasing the temperature of a food and beverage product to destroy microorganisms, inactivate enzymes, preserve the food, and improve the edibility of some foods	Eggs, meat, vegetables, potatoes, cereal grains (rice, oats, wheat), and pasta	Yes	Food safety; shelf-life; impact flavor and texture of some food products	Potential loss of heat sensitive vitamin(s); changes color; impacts taste in some food products
Pasteurization	Heating food and beverage products at a specific temperature for a particular length of time	Milk, juices, some egg products, jams, jellies, and some sauces	Yes	Food safety; shelf-life	Potential loss of heat-sensitive vitamin(s); modifies protein structures
Frying	Rapid heating or cooking of a food product in hot oil (300-500 F)	Fried meat, potatoes (e.g., French fries or potato chips), fried vegetables, and eggs	Yes	Food safety; shelf-life; changes texture and color and flavor	Adds fat to the food, thereby increasing calorie content of the food; potential loss of heat-sensitive vitamin(s); modifies protein structures; could impart burnt flavor; could generate components that are potentially carcinogenic (e.g., acrylamide)
Grilling	Cooking a food product over open flame (usually 350-600 F) for a specified time to achieve a desired temperature within the food product	Meat, potatoes, and vegetables	Yes	Food safety; shelf-life; imparts favorable taste, texture, and appearance	Potential loss of heat-sensitive vitamin(s); modifies protein structures; imparts burnt flavor; generates compounds that are potentially carcinogenic (e.g., acrylamide)

For a more comprehensive list of food processing technologies benefits and impacts please **visit our online Food Processing Toolkit at ift.org/policy-and-advocacy/advocacy-toolkits/food-processing.**