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**Convenience food**

Convenience food, or tertiary processed food, is commercially prepared food designed for ease of consumption.[[1]](http://en.wikipedia.org/wiki/Convenience_food#cite_note-Nutrition_Bible-0) Products designated as convenience foods are often prepared food stuffs that can be sold as hot, ready-to-eat dishes; as room-temperature, shelf-stable products; or as refrigerated or frozen products that require minimal preparation (typically just heating).

These products are often sold in [portion controlled](http://en.wikipedia.org/wiki/Portion_control_(dieting)), single serve [packaging](http://en.wikipedia.org/wiki/Packaging) designed for portability and "on-the-go" eating. Convenience food can include products such as [candy](http://en.wikipedia.org/wiki/Candy); [beverages](http://en.wikipedia.org/wiki/Beverages) such as [soft drinks](http://en.wikipedia.org/wiki/Soft_drinks), [juices](http://en.wikipedia.org/wiki/Juices) and [milk](http://en.wikipedia.org/wiki/Milk); [fast food](http://en.wikipedia.org/wiki/Fast_food); [nuts](http://en.wikipedia.org/wiki/Nut_(fruit)), [fruits](http://en.wikipedia.org/wiki/Fruits) and [vegetables](http://en.wikipedia.org/wiki/Vegetables) in fresh or [preserved](http://en.wikipedia.org/wiki/Dried_fruit) states; [processed meats](http://en.wikipedia.org/wiki/Cold_cut) and [cheeses](http://en.wikipedia.org/wiki/Processed_cheese); and [canned](http://en.wikipedia.org/wiki/Canning) products such as [soups](http://en.wikipedia.org/wiki/Soup) and [pasta](http://en.wikipedia.org/wiki/Pasta) dishes.

History

Modern convenience food saw its beginnings in the period that began after [World War II](http://en.wikipedia.org/wiki/World_War_II) in the United States. Many of these products had their origins in military developed foods designed for storage longevity and ease of preparation in the battle field. After the war, many commercial food companies were left with surplus manufacturing facilities. These companies developed new lines of canned and freeze dried foods that were designed for use in the home. Like many product introductions, not all were successful—convenience food staples such as [fish sticks](http://en.wikipedia.org/wiki/Fish_sticks) and [canned](http://en.wikipedia.org/wiki/Canning) [peaches](http://en.wikipedia.org/wiki/Peach) were counterbalanced by failures such as ham sticks and cheeseburgers-in-a-can.

Critics have derided the increasing trend of convenience foods because of numerous issues. Several groups have cited the environmental harm of single serve packaging due to the increased usage of [plastics](http://en.wikipedia.org/wiki/Plastics) that contributes to [solid waste](http://en.wikipedia.org/wiki/Solid_waste) in [landfills](http://en.wikipedia.org/wiki/Landfills).

Nutritional issues

According to a page on the website of the [Cleveland Clinic](http://en.wikipedia.org/wiki/Cleveland_Clinic): "Most convenience foods on the market today are laden with saturated fats, sodium and sugar and provide little to no nutritional value.

Salt

[Salt](http://en.wikipedia.org/wiki/Salt) is an essential nutrient, but sodium, usually in the form of salt, has been linked with [high blood pressure](http://en.wikipedia.org/wiki/Hypertension). A single serving of many convenience foods contains a significant portion of the recommended daily allowance of sodium. Manufacturers are concerned that if the taste of each product is not optimized by adding salt that it will not sell as well as competing products. Tests have shown that some popular packaged foods are dependent on significant amounts of salt for their [palatability](http://en.wikipedia.org/wiki/Palatability)

Labeling, mitigation, and regulation

In response to the issues surrounding the healthfulness of convenience and restaurant foods, an initiative in the United States, spearheaded by [first lady](http://en.wikipedia.org/wiki/First_Lady_of_the_United_States) [Michelle Obama](http://en.wikipedia.org/wiki/Michelle_Obama) and her "Let's Move" campaign, to reduce the unhealthy aspects of commercially produced food and fight childhood obesity, was unveiled by the [White House](http://en.wikipedia.org/wiki/White_House) in February 2010. Using her position as a [bully pulpit](http://en.wikipedia.org/wiki/Bully_pulpit), Mrs. Obama has pushed the industry to cut back on sugars and salts found in many convenience foods, encouraging self regulation over government intervention through laws and regulations.[[8]](http://en.wikipedia.org/wiki/Convenience_food#cite_note-dp-sweet-7) Despite Mrs. Obama's stated preference on self-regulation, the [Food and Drug Administration](http://en.wikipedia.org/wiki/Food_and_Drug_Administration) announced that it was looking into quantifying the guidelines into law while other groups and municipalities are seeking to add other preventative measures such as target taxes and levies onto these productIn response to the attention, in April 2010 a coalition of sixteen manufactures all agreed to reduce salt levels in foods sold in the United States under a program based on a similar effort in the United Kingdom. However, the initiative has met with resistance from some manufacturers, who claim that processed foods require the current high levels of salt to remain appetizing and to mask undesirable effects of food processing such as "[warmed over flavor](http://en.wikipedia.org/wiki/Warmed_over_flavor)".[[7]](http://en.wikipedia.org/wiki/Convenience_food#cite_note-nyt-hardsell-6) The coalition expanded its mission in May 2010 by announcing that it intends to reduce the amount of calories in foods. By introducing lower calorie foods, changing product recipes and reducing portion sizes, the coalition stated that it expected to reduce the caloric content of foods by more than 1.5 trillion calories in total by 2012.

**Advantages and Disadvantages of Convenience Foods**

**Comparing Nutrition**

**AdA**

|  |  |
| --- | --- |
| Advantage | Disadvantage |
| • Modern production techniques and  preservation methods minimize  nutritional loss of precooked products.  • Frozen vegetables take less time to  prepare but often have the same  nutritional value as fresh products if  they are frozen immediately after  harvesting. In most cases, the  nutrients and vitamins are preserved.  • Nutrition information is easily  accessed by the nutrition label. | • Convenience foods may be higher in fat  making their energy content (calories)  high.  • Convenience foods are often higher in  sodium because it is a cheap flavor.  • The cook cannot control the ingredients  of the product; therefore it is harder to  control the sugar, fat, and salt content.  • Convenience foods allow little recipe  modification.  • Convenience foods are often processed |

**vAantages Disadvantages**

**Crispy Homemade Chicken Nuggets**

1lb boneless, skinless chicken breast, rinsed and patted dry with paper towels

1 ½ cups plain yogurt

3 cups crushed corn flakes

2 Tbsp. fresh parsley, chopped

1 Tsp. sea salt

½ Tsp. freshly ground white pepper

Vegetable or olive oil for spraying pan

Plastic or Paper bag

1. Pre-heat oven to 375° F

2. Slice chicken breasts into 2-inch strips. Marinate in the refrigerator in yogurt

from 1 hour to 24 hours.

3. Combine corn flakes, parsley, salt and pepper in a bowl. Put mixture in

plastic or paper bag and drop chicken in a few pieces at a time. Shake well to

coat the chicken.

4. Remove the chicken pieces from the bag, shaking the extra coating off. Put

them on a sheet pan lightly sprayed with oil.

5. Bake for 25 minutes, or until crunchy on the outside and cooked through on

the inside.

|  |  |
| --- | --- |
| **Tyson Chicken Nuggets** | **Homemade Chicken Nuggets** |
| 2 oz serving = 8 nuggets  Calories 360  Calories From Fat 252  Total Fat 28g  Saturated Fat 6g  Cholesterol 60mg  Sodium 760mg  Total Carbohydrate 14.8g  Protein 13.2g  Fiber 1.2g | 2 oz serving = 4-5 nuggets *(1/4 the recipe)*  Calories 260  Calories From Fat 30  Total Fat 3.5g  Saturated Fat 1g  Cholesterol 65mg  Sodium 900mg  Total Carbohydrate 26g  Protein 30g  Fiber 1g |
| • Prep time = 2 minutes  • Bake time = 10 minutes | • Prep time = 15 minutes  • Bake time = 25 minutes |
| Cost to serve 4 (6-12 year olds)  $3.33 | Cost to serve 4 (6-12 year olds)  $4.13 |
| • Was sick of them before eating  all 8 nuggets  • Low quality of chicken  • Breading tasted pretty good | • Chicken tasted good  • Crunchy, but some of breading  came off |

**How to read the food label**

Even if you decide to buy a convenience type product or a mix, you can still check

the list of ingredients to try to find the healthiest product available. The food label lists the

ingredients of a product in order of what the product has the most of to what is found in the

least amounts in the product. Reading your labels will help you find the foods that are high in salt, fat and sugar. If any of the **first three ingredients** contain the following,

they are high in **sugar** and/or **fat**:

- Sugar - Shortening - Hydrogenated vegetable oil

- Fructose - Corn Syrup - Coconut oil

- Lard - Dextrose - Glucose

- Honey - Beef Tallow - Palm kernel oil

Most products claim something now. Either they are *.low-fat.*,

*.light.* or *.healthy..*

**What does all this mean?**

The U.S. Food and Drug Administration says the product has to meet certain

requirements for the manufacturer to make certain claims.

• *Healthy* . the food is low in fat (especially saturated and/or trans fat) and

has reduced amounts of sodium and cholesterol

• *Good Source* . one serving will provide 10-19% of your total daily value

for the specified nutrient

• *Free* . it contains only tiny amounts of what is indicated (ex: fat free,

sodium free, sugar free, cholesterol free)

• *Low sodium* . one serving has 140 mg or less

• *Low cholesterol* . one serving has 20 mg or less of cholesterol, or 2 grams

or less of saturated fat

• *Low fat* . one serving has 3 grams or less of fat

• *Reduced* . one serving has 25% less of what is indicated than the regular

version of the product (ex: reduced fat, reduced calories, reduced sodium)

• *Light (or Lite)* . one serving has 50% less fat, or 1/3 fewer calories than

the regular version of the food.

**HEALTHY TIP:** Reduced fat cookies may not be as low in fat as they seem. They are just lower

in fat than the original version of that cookie. Read the label, you may be able to find a better

choice.

**Why do we care about fat and sodium levels**

It seems like all you hear about these day is saturated fats and Trans fats. What

are they and why do we care about them so much?

• **Saturated Fat** . mainly found in animal products such as meat, dairy and

eggs. Plant foods such as coconut and palm oil also have high levels of

saturated fats.

• **Trans Fat** . this is something created by scientist to hydrogenate liquid

oil. It is found in many commercially packaged foods like microwave

popcorn, because it provides a better shelf life. It can also be found

margarine and in fast food like French fries.

Consuming a lot of fat, in particular *saturated fat* can increase the levels of

cholesterol in your body which has been associated with an increased risk of

coronary heart disease. Cholesterol is only found in animal products, because

only animals make cholesterol.

LDL is considered the .bad. cholesterol because it increases the amount of

plaque that attaches to your blood vessels

HDL is considered the .good. cholesterol because it helps get rid of the

cholesterol in the blood. The HDL picks the plaque and carries it away to the

liver for excretion.

• **Monosaturated fats** . lower total cholesterol and LDL cholesterol (bad)

and raises HDL cholesterol (good). It can be found in nuts, canola and

olive oils.

• **Polyunsaturated fats** . lower total cholesterol and LDL cholesterol (bad).

It can be found in fatty fish like salmon and fish oils, also corn, soy,

safflower, flax seed and sunflower oils.

## Food Processing and Preservation

Canadian consumers want safe, nutritious, inexpensive food throughout the entire year. Unfortunately, Canada's climate limits the production of food for up to six months of the year. Just store the food? Impossible. Once food is harvested, it begins to deteriorate immediately due to the following factors:

* micro-organisms (yeast, mould, bacteria);
* intrinsic enzymes;
* temperature;
* moisture; and
* insects and vermin.

Because of the risk of spoilage, much of our food is processed in some way to increase its availability. A food is considered preserved once it is stabilized with respect to safety and quality.   
  
It's important to note that no type of food processing can transform poor quality raw materials into good ones. It can only increase the product's shelf life. To ensure that your product meets your high standards:

* use the highest quality raw ingredients;
* establish good processing techniques-and follow them; and
* maintain an appropriate product environment after processing.

Not all processing methods are applied to foods to achieve preservation. Some are also used to change or stabilize food texturally.

### Processing Methods

Methods of processing food can be divided into two main categories-chemical and physical.

#### Chemical Processing Methods

The following techniques use the chemical approach in processing food.

##### Intermediate Moisture Foods (IMF)

Binding the water that's present preserves intermediate moisture foods-for example, cookies, cake and bread. This reduces the availability of the water for deteriorative reactions.

Water is immobilized by adding permissible humectant additives such as glycerol, glycols, sorbitol, sugars and salts.

Generally, IMFs possess water activities that range from 0.6 to 0.85. This enables the food to be stable at room temperature, because the growth of most micro-organisms is inhibited at these levels.

##### Water Activity (aw)

Water is the most important factor in controlling the rate of deterioration of a food. However, knowledge of the moisture content of a food isn't sufficient to predict its stability. It is the availability of water for microbial, enzymatic, or chemical activity that determines the shelf life of foods. This water availability is measured as water activity (aw).

Water activity is measured on a scale of 0 to 1, where 0 indicates no water and 1 indicates all water. Food spoilage micro-organisms, in general, are inhibited in food where the water activity is below 0.6. However, if the pH of the food is less than 4.6, micro-organisms are inhibited when the water activity is below 0.85.

##### Addition of Chemicals

The addition of some chemicals inhibits microbial growth in foods. These chemicals include not only those classified as **preservatives**. Salt, sugars, wood smoke and some spices also inhibit the growth of micro-organisms. For more information on chemical preservatives, see Part 4: Food Ingredients in this guide.

##### PH Control

Almost every food, with the exception of egg whites and soda crackers, has a pH value of less than 7. Foods can be broadly categorized on the basis of their pH as high acid, acid, medium acid or low acid. Examples of each category include:

* **high acid (3.7)** : apples, lemons, raspberries
* **acid (3.7 to 4.6)** : oranges, olives, tomatoes (some)
* **medium acid (4.6 to 5.3)** : bread, cheese, carrots
* **low acid (over 5.3)** : meat, fish, most vegetables

Most micro-organisms grow best in the pH range of 6.5 to 7.5. Yeasts and moulds are capable of growing over a much broader pH range than bacteria. Few pathogens will grow below pH 4.0. This information is important, because it will help you in determining food stability with respect to microbial spoilage.

#### Physical Processing Methods

A number of physical methods are available to you for processing foods.

##### Sterilization (Retorting)

First, a science note: a pathogen is any microorganism that causes illness. Food pathogens cause food-borne illnesses such as food poisoning or food intoxication.

Sterilization destroys all pathogenic and spoilage micro-organisms in foods and inactivates enzymes by heating. All canned foods are sterilized in a retort (a large pressure cooker). This process enables food to have a shelf life of more than two years.

Foods that have a pH of more than 4.6, such as meat and most vegetables, must undergo severe heating conditions to destroy all pathogens. These foods are heated under pressure to 121°C for varying times.

Severe conditions are applied to ensure that Clostridium botulinum spores are destroyed during processing. These spores produce the deadly botulinum toxin under anaerobic conditions (that is, where there's no oxygen). The spores are destroyed by heat or are inhibited at pH values of less than 4.6. Therefore, a food with a pH of less than 4.6 that is packaged anaerobically, such as spaghetti sauce, doesn't need to undergo such a severe heat treatment.

##### Pasteurization

Pasteurization is the process of heating a food-usually a liquid-to or below its boiling point for a defined period of time. The purpose is to destroy all pathogens, reduce the number of bacteria, inactivate enzymes and extend the shelf life of a food product.   
  
Foods with a pH of less than 4.6, such as milk and spaghetti sauce, can be pasteurized.   
  
Permanent stability-that is, shelf life of about two years-is obtained with foods that can withstand prolonged heating, such as bottled juices.   
  
There is a greater loss of flavour from foods that are exposed to a longer time-temperature relationship. Therefore, temporary stability (that is, limited shelf life) is only obtained with some foods where prolonged heating would destroy its quality. These foods, such as milk, usually require subsequent refrigeration.   
  
"High temperature short time" (HTST) and "ultra high temperature" (UHT) processes have been developed to retain a food's texture and flavour quality parameters.

##### Blanching

Blanching is a slight heat treatment, using hot water or steam, that is applied mostly to vegetables before canning or freezing.   
  
Blanching is used before freezing to inactivate enzymes present that cause deteriorative reactions to foods during frozen storage. These reactions include colour and texture changes, off-flavours and a decrease in nutritional value.   
  
Blanching is used before canning for different reasons, because enzymes will inevitably be destroyed during canning. Blanching induces a vacuum in canned goods, and it's also used to control the fill into containers (for example, spinach).

##### Microwaving

Microwave ovens are rarely used for processing large quantities of food. They are mainly of interest if you cater to the convenience food market, with products such as frozen entr�es.   
  
Microwave ovens use electromagnetic radiation to excite water molecules in food. The actual waves penetrate only about 10 inches from the source of the radiation. Within the food, the waves only penetrate 3�4 to 1 inch on all sides. As a result, the actual ovens must be limited in size. Heat is produced within the food by the friction of water molecules, which spreads to the centre of the food by conduction.   
  
Small portions are cooked rapidly in microwave ovens. As the quantity of food increases, however, the efficiency is lost.

##### Frying

Frying differs from other methods of heat processing in that the cooking medium is hot oil. Because of the big difference between the temperature of the oil and the food, as well as the small size of the food pieces, cooking is completed in a relatively short time-anywhere from 20 seconds to six minutes.   
  
Fried foods are known for their characteristic crispy outer surface as well as their high fat content. The fat that is absorbed by the food product varies from 10 percent to 40 percent, depending on the time the food is immersed in the oil. Continuous fryers are often used in the food industry.

##### Refrigeration

Refrigerators should be set to below 4°C to control the growth of micro-organisms in foods. This lowered temperature also reduces the respiration rate of fruits and vegetables, which retards reactions that promote spoilage.   
  
Refrigeration is generally used to:

* reduce spoilage during distribution of perishable foods;
* increase the holding period between harvesting and processing; and
* extend the storage life of commercially processed foods.

Not all foods benefit from cold temperatures. For example, bananas turn black and bread goes stale when refrigerated.

##### Freezing

While many home freezers are held at -10°C, commercial freezers are under -18°C. At this temperature, the growth of micro-organisms is almost stopped. Deteriorative microbial reactions will still occur, but over a much longer time.   
  
In addition, deteriorative enzymatic reactions will still take place during frozen storage. Uncooked fruits and vegetables must be blanched before freezing to prevent these reactions.   
  
During freezing, the water in food forms ice crystals. The rate of this phenomenon has a big impact on the quality of frozen foods:

* **Slow freezing** (e.g. home freezer)  
  - large ice crystals formed, which puncture cell walls  
  - cellular fluid released

- results in shrunken appearance of thawed food

* **Rapid freezing** (e.g. blast freezer)  
  - small, numerous ice crystals formed  
  - no change to cell structure

The shelf life of frozen foods is largely dependent on storage conditions. Under ideal conditions, frozen foods can have a shelf life of one year.   
  
However, if foods are continuously exposed to warmer temperatures, such as the opening and closing of freezer doors, then heat shock occurs. Heat shock is when ice melts and re-forms into larger ice crystals. The best example is ice cream, which has a gritty texture if large ice crystals have developed.

##### Irradiation

Irradiation is the controversial process of applying low doses of gamma radiation to food products. Forty years of research have shown that the process exhibits no safety hazard. As a result, irradiation is permitted in Canada to:

* prevent sprouting in potatoes and onions;
* control insect infestation of wheat flour; and
* reduce the microbial load of ground spices.

If irradiation becomes more widespread among various other food products, it is expected to replace fumigation, ensure hygienic quality and reduce the dependence on refrigeration.

#### Weigh Your Options: Batch vs. Continuous Processing

Food is processed in either discrete batches or a continuous system. Although there are advantages and disadvantages to each method, choice in the matter is restricted only to those replacing or setting up a new processing line. Generally, batch systems are used to produce small quantities of food, whereas larger volumes are required for continuous systems.

|  |  |
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| **Advantages of Batch Processing** | **Advantages of Continuous Processing** |
| Greater flexibility to change product formulation and rates | Lower operation and labour costs |
| Lower equipment costs | Less floor space required |
| Easier operation and control | Greater product uniformity |

##### Evaporation

Evaporation is the partial removal of water from liquid foods by boiling. When the operation is done under vacuum, boiling is avoided and the food's flavour qualities are retained.   
  
Some of the foods that have undergone evaporation are evaporated milk, tomato paste and juice concentrates.

This process is carried out for three main reasons:

* to reduce the weight and, therefore, reduce storage and transport costs;
* to preserve foods by decreasing the water activity and increasing the solids content; and
* to provide consumers with convenient foods.

##### Dehydration

Dehydration-or drying-is the nearly complete removal of water from solid foods. One of the oldest methods of food preservation, it was traditionally carried out by the sun.   
  
This application is used for the same reasons that liquid foods undergo evaporation-preservation, convenience and cost savings. Dried soup mixes, dried fruit, powdered milk and spices are just a few examples of dehydrated foods.

Spray drying and freeze drying are two drying methods used widely today. Spray drying is when a liquid food is atomized into a fine, dry powder. Examples include natural and artificial flavours and milk powders. Freeze drying involves first freezing the food and then driving off the ice, leaving a high quality, porous dried food such as instant coffee.

##### Emulsions

An emulsion is a system containing two liquid phases that don't mix, where one phase (dispersed phase) is distributed throughout the other phase (continuous phase) in the form of very small droplets. Generally there are two types of emulsions:

1. oil in water (O/W)
2. water in oil (W/O)

An example of an O/W emulsion is salad dressing, and an example of a W/O emulsion is butter.

##### Homogenization

Homogenization is used to stabilize an emulsion. More specifically, it is the reduction in size and the increase in number of droplets of the dispersed phase by the application of intense shearing forces.   
  
Generally, homogenization is applied to change the functional properties or improve the texture of emulsions. For example, most fluid milk sold at the retail level is homogenized to improve its stability, and most caramel fillings are homogenized to increase their smoothness.

##### Extrusion

Extrusion is the process in which a food is compressed and worked to form a semi-solid mass. This mass is then forced through a restricted opening, or die, to create a desired texture or shape. The purpose of this application is simply to provide a greater variety of textured foods to consumers.   
  
Food may also be cooked while extruded. This is referrred to as extrustion cooking or hot extrusion.  
  
Some extruded food products are licorice, puffed wheat and cornflakes.

##### Hurdle or Combination Processing

Hurdle technology is a concept that was developed to address the consumer demand for more natural, fresh-like foods. It is a way for food processors to employ only mild preservation techniques to their food products.   
  
The idea is to use deliberate low-level combinations of existing and novel preservation techniques ("hurdles") to eliminate the growth of micro-organisms. Lower-intensity individual methods can be used because of the collective effect of the combined methods. Some of the more common hurdles include:

* pasteurization;
* water activity (aw);
* salt;
* blanching;
* freezing; modified atmosphere packaging (MAP);
* pH;
* preservatives;
* refrigeration; and
* irradiation.

Some micro-organisms present will be able to survive the individual treatments applied. However, no microorganism will be able to overcome all of the combined hurdles. Thus the food is stable and safe.   
  
The only way to ensure that the correct combination of hurdle technologies is used is to make sure that a qualified resource conducts quality and safety shelf-life studies. For a list of product development laboratories that can do these studies, see the Resources section of this guide.   
  
Examples of hurdle processing can be found in traditional and recently developed foods, such as yogurt and prepackaged fresh salads. The hurdles employed in yogurt manufacture include low temperatures, high acid and competitive microbial flora. Those used to prepare prepackaged fresh salads include low temperatures and modified atmospheres.

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Ref:

1)Wikipedia .com

2)my learning.org