

## The History and Principles of Canning



The canning process dates back to the late 18th century in France when the Emperor Napoleon Bonaparte, concerned about keeping his armies fed, offered a cash prize to whoever could develop a reliable method of food preservation. In the 1790's, Nicholas Appert conceived the idea of preserving food in bottles, like wine. After 15 years of experimentation, he realized if food is sufficiently heated and sealed in an airtight container, it will not spoil. In about 1806 Appert's principles were successfully trialed by the French Navy on a wide range of foods including meat, vegetables, fruit and even milk.

In 1810, an Englishman, Peter Durand, took the process one step farther and developed a method of sealing food into unbreakable tin containers, which was perfected by Bryan Dorkin and John Hall, who set up the first commercial canning factory in England in 1813.



As more and more of the world was explored, and as provisioning armies took on greater importance, the demand for canned foods grew. Thomas Kensett, who emigrated to the United States, established the first U.S. canning facility for oysters, meats, fruits and vegetables in New York in 1812. More than 50 years later, Louis Pasteur provided the explanation for canning's effectiveness when he was able to demonstrate that the growth of microorganisms is the cause of food spoilage.

### The Natural Option: Contemporary Canning

The basic principles of canning have not changed dramatically since Nicholas Appert and Peter Durand developed the process. Heat sufficient to destroy microorganisms is applied to foods packed into sealed, or "airtight" containers. The canned foods are then heated under steam pressure at temperatures of 240-250°F (116-121°C). The amount of time needed for processing is different for each food, depending on the food's acidity, density and ability to transfer heat. For example, tomatoes require less time than green beans, while corn and pumpkin require far more time.

Processing conditions are chosen to be the minimum needed to ensure that foods are commercially sterile, but retain the greatest flavor and nutrition. All processes must be approved by the U.S. Food and Drug Administration. Once the cans are sealed and heat processed, the food maintains its high eating quality for more than two years and is safe to eat as long as the container is not damaged in any way. And, like the home canning process, no preservatives are added or necessary.

The sequence of steps in the canning process differs with the product. Fruits and vegetables may be peeled or pitted, and have stems removed prior to canning. Some

vegetables receive a heat treatment before they are placed in the can to remove air and improve packing. (Think about the bulk of raw vs. cooked spinach!) Acid juices, like orange and tomato, and acid vegetables, such as sauerkraut, can be sterilized before they are placed into containers. Seafood is usually packed after being boned or shelled, with the exception of smaller fish like sardines and anchovies, or even salmon, which have bones that are softened by heating. Meats and fish, like tuna, are usually cooked to soften the flesh before canning, separated from bones, compacted and placed in cans with appropriate liquid.

One significant difference in the modern canning process is that today's cans are made of 100% recyclable steel.

### **Packed at the Peak of Freshness**

To ensure that foods are packed at their peak of freshness, most canning facilities are located within a few miles of the point of harvest. Fruit and vegetable canneries often can be seen from the fields where produce is harvested. Seafood canneries are within minutes of the docks. Meats, soups and stews are canned within the facilities in which they are prepared. Minimizing transportation keeps costs down as well as ensuring that food, especially fruits and vegetables, are packed when the flavor is greatest.

### **Canned Food Nutrition**

Because canned food is packed at the peak of harvest, it also is packed at its nutrient peak. As foods age, they begin to shed some of their essential nutrients. Fruits and vegetables especially have the highest nutrient content when they are ripest. Since canneries are located close to the point of harvest, few if any nutrients are lost in transit. According to a 1997 University of Illinois study and other recent studies, the canning process actually may help to enhance the nutrient profile of certain foods. Canned pumpkin, for example, contains 540% of the Recommended Daily Intake of vitamin A, while the same amount of fresh pumpkin has only 26%. Other foods like canned beans have higher fiber content, and canned tomatoes contain significantly higher quantities of lycopene, an essential phytochemical, than fresh tomatoes.

### **Safety Benefits**

The canning process was developed to preserve food safely and for long periods of time. Once a food is packed into a can, the can is heated to a temperature extreme which kills all known microorganisms. In addition, most processed foods are closely monitored, using a system called Hazard Analysis and Critical Control Point, or HACCP. A HACCP system identifies areas of potential contamination within the food process and builds check points to ensure that the highest possible safety standards are maintained at all times. Modern processors maintain close watch on the heating process, ensuring that the canned food that reaches the market is the safest possible product for the consumer.

### **Available Canned Foods**

Virtually any food that is harvested or processed can be found in a can. In fact, for decades, many foods were only available in cans. Today, the consumer has more options and can often find fresh and frozen alternatives to canned food, but canned food remains an essential part of the contemporary pantry.

***Information from the Canned Food Alliance.***