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## EC9924 The Story of Home Canning

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COOPERATIVE EXTENSION WORK  
IN AGRICULTURE AND HOME ECONOMICS  
U. of N. Agr. College & U. S. Dept. of Agr. Cooperating  
W. H. Brockaw, Director, Lincoln

Extension  
Circular  
9924

1939

THE STORY OF HOME CANNING  
Mrs. Carol Clark Theim

"To you who are striving to make your best better"--is a phrase once used by Miss Carrie Harrison, of the U. S. Department of Agriculture, which expresses the sentiment today animating the tens of thousands of Extension club women and 4-H club girls who are doing home canning.

Most great industries have existed in some form for a long period of time, but preservation of food stuffs by canning is distinctly a modern art. It was not until the 19th century that canning as we know it today was developed; up until this time, drying, pickling, smoking, and preserving in sugar were the only methods used.

Early History

The wars of Napoleon and resulting English Blockade were directly responsible for the discovery of the efficacy of the hermetic sealing of foods in order to keep them. Near the end of the 18th century a prize of 12,000 francs was offered by the French government for the most practical method of preserving foods for sea service and military stores. This reward stimulated many men to begin experimenting. The most successful of these and the one who was awarded the 12,000 francs was M. Nicholas Appert, of Paris, who experimented from 1795 until 1809 and finally published his results in 1810.

Appert enclosed fruit, which had been heated, in a glass bottle, inserted a cork and submitted the bottle to the action of boiling water for varying lengths of time depending upon the food stuff enclosed. He could not explain, however, why the food thus treated did not spoil. He believed that air was the destructive agent and that its exclusion alone would preserve food which had been cooked. Since Appert had for nearly 50 years been working as a pickler, preserver, expert confectioner, brewer, distiller and chef, his background of experience had given him excellent preparation for his experiments. He worked with many different products and so perfected the art of canning in glass that it is difficult to have more perfect results even with our modern appliances. Although we might be prone to laugh at his simple equipment and though his explanation was incorrect, his methods, odd as it may seem, worked.

We should remember that at this time means of communication were exceedingly slow, that people often lived great distances from a supply of necessary foods and that refrigeration was unheard of. Hence, that the development of this method whereby food could be preserved in an edible condition for an indefinite period of time was a definite step toward positive nutrition and the opportunity to develop new frontiers. The feeding of his soldiers had been a far more baffling problem to Napoleon than the development of successful military tactics.

Conclusions drawn by Guy Lussac, an eminent French chemist, who was employed by his government to investigate canning, coincided with what appeared to be the controlling factor in the practice of canning. He attributed the spoil-



ing of food to a series of oxidation changes, and believed that by excluding the air these changes could be prevented and the food saved. His theory was accepted, and the true explanation of the matter was not known until the advent of the new science, bacteriology. Since the principle of Appert's methods has been shown by time and experience to be correct, it is that on which all canning and preserving has since been done. He is regarded as the father of an art which has proved a boon to all mankind. Since his method was so simple, others put it into practice and before 1830 it was used commercially. A monument of his memory was erected by the French government. Many homemakers even today use the water-bath method just as Appert did. The information on canning was desired by the French government primarily for military and naval stores, but the advantage of having food preserved in this manner attracted considerable attention to its use in the home.

"A Method of Preserving Fruits Without Sugar for House and Sea Stores" was the title of a paper submitted to the English society of arts by Mr. Sadding in 1807. He probably obtained his information from Appert while traveling in France. At about the same time, Peter Durrand obtained a patent in England for preserving meat, fruit and vegetables in tin cans. He is sometimes called the father of the tin can.

After Peter Durrand's patent, the canning industry depended more and more upon the can; in fact it took its name "canning" from it. Naturally, the first apparatus for manufacturing tin cans was very crude and all cans were the same size. Gradually labor-saving machinery was developed which produced more perfect cans at a much smaller cost. Commercial canners used tin cans in preference to glass because they withstood extreme temperatures, the initial cost was less, loss from breakage was eliminated and the cost of transportation was lower. However, for home canning the glass container has always been most widely used. Glass containers are also popular in the more exclusive canning and preserving kitchen where very special products are put into fancy packs.

During the time of Tyndall and Pasteur, 1822 to 1895, the real cause of putrefaction was determined to be living microorganisms which come in contact with the material which spoils. These men discovered heat to be the fundamental principle involved in canning. They proved that air played no definite part in putrefaction but that the presence or absence of active bacteria was the controlling factor.

#### Commercial Canning

As to the exact development in the early history of commercial canning in this country, authorities are not at all in agreement, but the year 1821 closely approximates the date of birth of the American canning industry. In that year William Underwood packed preserves and table condiments in glass in Boston, and in 1835 he packed tomatoes in glass. In 1837 Isaac Winslow began experimenting with the canning of corn in Portland, Maine; he canned it on the cob and the bulk made it unsatisfactory. 1840 marks the date of the first cannery in Baltimore; in 1860 the canning of corn, tomatoes and fruits was started in Cincinnati, Ohio. The canning industry grew by leaps and bounds. H. L. Russell, of the University of Wisconsin, was the first man in this country to apply the science of bacteriology to canning, in 1895; and in 1896 professor



S. C. Prescott, of the Massachusetts Institute of Technology, and W. L. Underwood, of Boston, began making investigations as to the bacteriological aspects of canning. The commercial art of canning until this time was a mixed lot of theory surrounded by mystery.

In these days of commercial canning, an outsider would have found it almost impossible to gain entrance to a factory since the canner himself knew so little about his own industry that it was necessary to guard his own ignorance carefully. The possibility of spoilage and resulting losses was a constant source of worry to commercial canners. The public regarded bacteria as associated with disease and canners disliked having canning connected with germs because they felt it would frighten people and they would therefore not desire to eat canned goods. Since science has brought us greater information in regard to micro-organisms, those engaged in the canning industry have been enabled to employ scientific principles and thus control practical problems involved in the preserving of food by canning.

#### Development of Equipment

Better equipment for canning was gradually developed. When corn canning was first begun, the corn was cut from the cob with a common case knife; then came the use of a curved form shaped to the ear. "Cutters" were the most numerous workmen in the factories. In 1875 machines run by hand came into use and in 1886 power machines were installed in many of the factories. Much improvement has been made on all machinery since that date. For example, today machines remove the husk from the corn, take off the silk, cut the kernels from the cob, fill the cans, seal the cans and put on the labels. Machines are operated automatically and carry the products through the different departments in a very short time.

#### Methods

In the early days of the canning industry the open-kettle method was used. Later the water-bath was used in which the highest obtainable temperature was 212 degrees Fahrenheit. It was soon realized that a higher temperature would kill more germs and insure more successful results in a shorter length of time. Common salt was added to the water bath in order to raise the boiling point. It was also found that by adding chloride of calcium to water the specific gravity of water was increased and a temperature of 240 degrees Fahrenheit was obtainable. The advantage claimed for this method was that it was fuel-saving and labor-saving. A little later the "steam-jacketed" copper kettles and the "closed-process" came into use and the water-bath was abandoned in commercial canning. Later the steam retort replaced other processing mediums. It has met with wide-spread acceptance because of the ease with which high temperatures can be reached.

In our own country as well as abroad we find that war again influenced the development of the canning industry. The advent of the Civil War with the consequent demand for packaged or preserved foods, gave impetus to the growth of the canning industry. In 1873, a new era in canning was begun with the introduction of the retort, or pressure cooker, which permitted heat-processing of foods at temperatures higher than that of boiling water. With the turn of the century came the development of automatic machinery for can manufacture, replacing the slower and costlier hand methods of manufacture. By 1914, the use of the present day "sanitary style" can had become practically universal in



commercial canning factories. From the humble beginning of Underwood, Kensett and Winslow, between 1821 and 1840, the American canning industry now includes more than 2,000 establishments in all but four states of the Union, as well as in Alaska, and the Hawaiian Islands.

#### Home Canning

So far we have considered principally the discovery of the underlying principles in canning, development of canning methods and the growth of the canning industry. There is little, if any, information available in regard to the extent of home canning, although it is certain that homemakers did can. However, with only their own initiative and experimentation as a guide, they, no doubt, had much spoilage and much of the food was not palatable. Preserving of food at home was done at first through the use of preservatives such as salt, sugar, and by drying.

It was not until 1858, that Robert Mason invented a glass jar that made home canning the easy, economical, popular activity that it is today. Mason's invention consisted of the threaded opening that makes it possible to screw a Mason cap onto a jar. The Mason patent has long since expired, and all domestic fruit jar manufacturers now make a mason jar, that is, a jar with a threaded opening on which the cap is screwed. The mason jar has been the foundation of home canning activities since its invention in 1858, and until 1902 it was the only jar that was successfully sold for domestic canning.

In 1902, Alexander H. Kerr introduced the self seal, and it is still the most successful deviation from the threaded principle. When Mason invented the threaded opening jar, it was thought that the rubber ring was the only practical means of making an air-tight gasket between the glass jar and the metal or glass cap. That idea persisted for domestic canning until Mr. Kerr perfected the self-seal in 1902. A sealing gasket is attached to the cap instead of a rubber ring between the jar and the cap. The lid was held in place by a clamp. Later Mr. Kerr combined the self-seal principle with the older accepted Mason jar. The wide mouth jar was introduced about 1915.

It was not until the advent of the World War that we find various agencies interested in homemaking putting forth a definite interest in home canning. Home economists realized that canning was an answer to a reduced food budget through the home production and conservation of food and also an answer to insuring a balanced diet throughout the year for the American family. Experimentation was begun and results were published and made available to the homemakers of the nation especially through the facilities of the Extension Service. If we stop to recall some of the first bulletins on home canning and the information presented at early canning demonstrations, we will note that the methods recommended were quite different from those presented now. In the case of corn, for instance, it was recommended that the corn be packed firmly enough to form its own juice, salt added and the product processed in the water bath. Now we know that corn should be packed very loosely, plenty of liquid added and that only pressure cooker is safe for processing the product. True, much spoilage did result in these early days of home canning, but, nevertheless, homemakers became increasingly interested in canning and realized more and more its value in reducing the food budget and in making possible a balanced diet throughout the year.



### Pressure Cookers

Homemakers have been encouraged to purchase pressure cookers since it is only in the pressure cooker that temperatures higher than boiling can be reached and in which non-acid products can be safely processed. There is no definite information on the number of homemakers who own or have access to the use of a pressure cooker, but sales records on pressure cookers indicate that the number must have made enormous growth in the past ten years.

### Recent Situation

The depression has made homemakers exceedingly conscious of the food budget and we find an ever growing interest in home canning and an eagerness for more information in regard to causes of spoilage and its prevention. Even in sections where drouth and grasshoppers have made garden conditions most discouraging, large groups of homemakers have attended canning demonstrations.

Although an intense effort has been made to give every homemaker adequate information, it is deplorable to note how little homemakers in some sections know about domestic canning and to observe some of the unsafe methods that are still in use.

The Bureau of Home Economics, State Extension Services and reliable manufacturers of canning equipment are making every effort to encourage home canning and to make it a safe, economical, and easy process. Loss through spoilage is still a factor in domestic canning and experimentation is constantly being carried on in an effort to eliminate it. Complete success is dependent upon experimentation followed by homemaker education.