

APPERTIZING

OR

The Art of Canning; Its History and Development

BY

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PREFACE

A new method for conserving foods for a long time was announced in 1810 by Monsieur Nicolas Appert, a Frenchman, who found through experiments that food substances placed in tight containers, hermetically sealed, and subjected to a due amount of heat would keep. This simple discovery was accompanied by an admonition emphasizing the use of only strictly fresh, sound materials, to observe celerity and scrupulous cleanliness in the preparation, and also to exercise the utmost care in closing the container and in the application of heat.

Though a few persons had the imagination to visualize some of the benefits which it was hoped might be realized, the full import of this discovery could not be grasped at the time. It remains for us a century and a quarter later to more nearly appraise its value in the light of the salutary effects upon health resulting through the making better and safer foods available at all times and places, in eliminating drudgery and the time consumed in food preparation in the kitchen, and by adding to the pleasures of the table. The enormous annual production of all kinds of canned foods is its own commentary upon its worth to industry. Appert's accomplishment deserves to rank among the outstanding achievements of all time and the author for what he was—"A Benefactor of Humanity."

Back of this masterpiece in food conservation were forty years of rich experience in almost every phase of food preparation and fifteen years of patient painstaking research conducted with such limited funds and equipment as to discourage an ordinary man, but so methodical and thorough was his work that he was able to give full directions for conserving most fruits, vegetables, meats, and soups. The results were based on many trials as scientific in conception and execution as if carried out in the best laboratories. He was unable to explain why his products kept other than that he believed the combination of heat and the exclusion of air averted the tendency to decomposition. Science could render him little aid since chemistry was only in its beginnings and bacteriology was unknown. It remained for Pasteur, a half century later, to supply the explanation, and after a lapse of another third of a century for Russell, Prescott and Underwood, and Macphail, independently and almost simultaneously to apply the new science to the industry.

The present canning practices are the result of evolution from the older methods gained from experience, the application of the sciences of physics, chemistry, biology, and bacteriology to the problems of food preparation and sterilization, plus engineering skill in developing systems and equipment to handle products in small or large quantities quickly, with the minimum of labor and under strictly sanitary conditions from the raw state to the finished package in the kitchen storeroom or in the warehouse.

It is the object of this work to present the more important facts in the history and development of this branch of the food conserving industry



M. APPERT

L'ART DE CONSERVER,

PENDANT PLUSIEURS ANNÉES,

TOUTES LES SUBSTANCES ANIMALES ET VÉGÉTALES;

OUVRAGE soumis au Bureau consultatif des Arts et Manufactures, revêtu de son approbation, et publié sur l'invitation de S. Exc. le Ministre de l'Intérieur.

PAR APPERT,

Propriétaire à Massy, département de Seine et Oise, ancien Confiseur et Distillateur, Élève de la bouche de la Maison ducale de Christian IV.

« J'ai pensé que votre découverte méritait
» un témoignage particulier de la bienveillance
» du Gouvernement. »

Lettre de S. Exc. le Ministre de l'Intérieur.

A PARIS,

CHEZ PATRIS ET Cie, IMPRIMEURS-LIBRAIRES, QUAI
NAPOLEON, AU COIN DE LA RUE DE LA COLOMBE, N° 4.

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1810.

THE ART  
OF  
PRESERVING

ALL KINDS OF

*Animal and Vegetable Substances*

FOR

SEVERAL YEARS.

BY M. APPERT.

APPROVED BY ORDER OF THE FRENCH MINISTER OF THE  
INTERIOR, ON THE REPORT OF THE BOARD OF  
ARTS AND MANUFACTURES.

TRANSLATED FROM THE FRENCH.

FROM THE SECOND LONDON EDITION OF 1812

NEW-YORK.

PUBLISHED BY J. LONGWORTH,

TRAPPESE GALLERY.

1812.

| Year | Cases       |             |
|------|-------------|-------------|
|      | No. 2½ Cans | No. 2½ Cans |
| 1912 | 2,478,175   | 6,330,219   |
| 1913 | 2,765,125   | 10,456,910  |
| 1914 | 4,010,235   | 14,472,077  |
| 1915 | 3,239,525   | 11,150,493  |
| 1916 | 3,239,330   | 14,975,534  |
| 1917 | 5,161,961   | 8,364,573   |
| 1918 | 4,516,053   | 13,771,952  |
| 1919 | 7,058,949   | 8,598,982   |
| 1920 | 6,753,198   | 6,450,000   |
| 1921 | 5,796,267   | 11,150,000  |
| 1922 | 9,159,509   | 8,740,451   |
| 1923 | 9,464,011   | 11,720,039  |

## X Extent of the Canning Industry

The growth of the peach canning industry is best shown by the statistics and while the figures are too large to be readily comprehended, they at least are comparative. The figures are for California only, but since the rest of the country packs only about a quarter of a million cases annually, these give a very nearly true basis for comparison.

The peach pack represents practically two-thirds of the pack of all fruits in the state and leads all others for the entire country. The volume exported is also an indication of the high regard with which it is held abroad as well as at home.

at 235° for 35 and 40 minutes respectively, and without spoilage when the cut-out weight was less than 20 ounces of solids in the No. 2½ can.

The cooking of spinach in California is regulated by the State Board of Health, and differs so radically from the foregoing that the regulation is quoted. The first regulation of 1922 is as follows: "Canned spinach shall be deemed adulterated within the meaning of the California Pure Food Act unless the same shall have been thoroughly and repeatedly washed in fresh water, blanched according to the best technical procedure, placed in retorts with an inside temperature of not less than 180° F., and sterilized at a temperature of not less than 252° F. for 50 minutes if packed in No. 2 or No. 2½ tins, or if packed in No. 10 tins it shall have been sterilized at a temperature of 252° F. for 90 minutes." This regulation was modified in 1924 as follows: "That inasmuch as the Federal Government has reduced the minimum cut-out weights on spinach to 66 ounces for No. 10s, 19 ounces for No. 2½s, and 13 ounces for No. 2s, and that inasmuch as these minimums insure more rapid heat penetration, . . .

"A No. 10 can shall receive not more than 84 ounces of blanched spinach, including weight of can, and shall be sterilized for 60 minutes at 252° F. The time (60 minutes) shall be counted after the retort has reached the temperature of 252° F. The pack should reach the retort with an initial temperature of not less than 140° to 150° F.

"A No. 2½ can shall receive not more than 24 ounces of blanched spinach, including weight of can, and be sterilized for 45 minutes at 252° F., observing the conditions mentioned for No. 10s.

"A No. 2 can shall receive not more than 17 ounces of blanched spinach, including weight of can, and be sterilized for 40 minutes at 252° F., observing the conditions mentioned for No. 10s.

"The methods of blanching and the lengths of time in the blanch will influence the cut-out weights, but a leeway to 68 ounces for No. 10s, 21 ounces for No. 2½s, and 14½ ounces for No. 2s is herewith permitted. Special care shall be exercised to avoid overfilling, and the personnel shall be instructed accordingly."

The cooking schedule at present is as follows:

| <i>Can</i>          | <i>Initial<br/>Temperature</i> | <i>Report<br/>Temperature</i> | <i>Time</i> | <i>Maximum<br/>Drained Weight<br/>(ounces)</i> |
|---------------------|--------------------------------|-------------------------------|-------------|------------------------------------------------|
| 8 oz. (Tamale)..... | 140                            | 252                           | 35          | 6.0                                            |
| 8 oz. (Buffet)..... | 140                            | 252                           | 35          | 6.25                                           |
| No. 1 .....         | 140                            | 252                           | 35          | 8.0                                            |
| No. 1 Tall .....    | 140                            | 252                           | 35          | 11.5                                           |
| No. 2 .....         | 140                            | 252                           | 45          | 14.5                                           |
| No. 2½ .....        | 140                            | 252                           | 45          | 21.0                                           |
| No. 3 .....         | 140                            | 252                           | 45          | 24.0                                           |
| No. 10 .....        | 140                            | 252                           | 50          | 70.0                                           |

These temperatures apply equally to both still and agitating.

A supplementary regulation permits cooking in the continuous agitating cooker as follows: No. 2 cans, 26 minutes; No. 2½ cans, 29 minutes; and No. 10 cans, 36 minutes at 252° F.

The present cooking schedules are a decided improvement upon those demanded in 1922. They are severe, causing some discoloration and softening of the product, as well as injury to the flavor. They were promulgated

The tomato ranks first in volume among canned fruits or vegetables, considering the regular form and various preparations. The volume of the regular pack is shown in the following table.

| <i>Year</i> | <i>Cases</i> | <i>Year</i> | <i>Cases</i> |
|-------------|--------------|-------------|--------------|
| 1891.....   | 3,322,000    | 1914.....   | 15,222,000   |
| 1892.....   | 3,223,000    | 1915.....   | 8,469,000    |
| 1893.....   | 4,300,000    | 1916.....   | 13,142,000   |
| 1894.....   | 6,456,000    | 1917.....   | 15,076,000   |
| 1895.....   | 4,034,000    | 1918.....   | 15,882,000   |
| 1896.....   | 3,383,000    | 1919.....   | 10,809,000   |
| 1897.....   | 3,964,000    | 1920.....   | 11,368,000   |
| 1898.....   | 5,652,000    | 1921.....   | 4,017,000    |
| 1899.....   | 7,154,000    | 1922.....   | 11,538,000   |
| 1900.....   | 5,495,000    | 1923.....   | 14,672,000   |
| 1901.....   | 4,268,000    | 1924.....   | 12,519,000   |
| 1902.....   | 9,282,000    | 1925.....   | 19,770,000   |
| 1903.....   | 10,157,000   | 1926.....   | 9,455,000    |
| 1904.....   | 8,516,000    | 1927.....   | 13,137,000   |
| 1905.....   | 5,576,000    | 1928.....   | 8,538,000    |
| 1906.....   | 8,361,000    | 1929.....   | 14,145,000   |
| 1907.....   | 12,918,000   | 1930.....   | 16,997,000   |
| 1908.....   | 11,497,000   | 1931.....   | 9,573,000    |
| 1909.....   | 10,984,000   | 1932.....   | 16,950,000   |
| 1910.....   | 9,235,000    | 1933.....   | 11,986,000   |
| 1911.....   | 9,749,000    | 1934.....   | 13,108,000   |
| 1912.....   | 14,022,000   | 1935.....   | 15,381,000   |
| 1913.....   | 14,206,000   |             |              |