CHAPTER XIII
VEGETABLES AND FRUITS

I. Vegetables and fruits represent a different and happier phase of the food situation than that of most of the staples. They represent a great potential reserve of foods for home consumption. Not only does their presence in the diet add to health, but it releases other foods for shipment abroad.

II. Composition and value in the diet.

Vegetables and fruits are similar in many respects.

A. Water.

Most vegetables and fruits are very high in water, many of the "watery" ones like cabbage, celery, spinach, and berries contain from 90% to 95%. Potatoes, sweet potatoes, corn, peas, beans, and also bananas and grapes, have much less water.

B. Proteins.

1. The protein is very low in most vegetables and fruits. Potatoes have only about 2% in the edible portion, and most others have even less.

2. It is much higher in the legumes—beans, peas, lentils, and peanuts. Lima beans and green peas, for example, even when fresh, have 7% protein, and when dry, from 18%...
II. Composition and value in the diet (continued).

to 25%. Thus baked beans, bean loaf, and similar dishes are meat substitutes, though they cannot be depended on too largely. Beans and peas are valuable and important meat substitutes if used in a diet containing some animal protein. (See chapter V.)
a. The varieties of beans and peas are numerous. Use the newer varieties as well as the ordinary white navy bean.
b. In response to a patriotic appeal, the 1917 bean crop was approximately 50% larger than normal. Nearly all of this increase was in colored beans, principally Colorado and New Mexico pintos and California pinks. They are much like the white bean in taste, composition, and in the method of cooking.
c. Soy beans, which have been much discussed lately, are high in protein (38%) and in fat (15%) — higher than other beans, but they are somewhat difficult to cook without a pressure cooker, unless made into meal.
d. The Army and Navy are using vast quantities of legumes and have contracted for practically the entire white bean crop.
e. The Food Administration purchased last year's entire crop of pinto beans, in order to distribute them to different markets, to keep the price stable, and to encourage the farmer to continue production next year.

C. Carbohydrate.

This is fairly high in some cases, notably in potatoes, which contain from 18% to 20% starch. Sweet potatoes have even more starch and sugar. Bananas have 22%, mostly sugar when ripe and starch when green. It is instruc-
II. Composition and value in the diet (continued).

tive to group the vegetables and fruits, as the diabetic patient must, into groups containing 5%, 10%, and 15% carbohydrate. Note that the leaf vegetables are all in the lower groups.

D. Fuel value.

The fuel value depends chiefly upon the amount of starch and sugar present. For leaf vegetables it is very slight. For some others, especially potatoes, sweet potatoes, bananas, and other sweet fruits, it is an important part of the fuel of the diet.

E. Crude fiber.

Fruits and vegetables contain a relatively high percentage of indigestible fiber. This fiber with other substances present tends to prevent constipation.

F. Ash constituents.

1. Vegetables and fruits are one of the richest sources of the necessary ash constituents of the diet. This is one of the most important points to emphasize in teaching the value of these foods. They are especially important as sources of iron and next in importance to milk as sources of calcium.

2. The ash content is higher in leafy vegetables like spinach, cabbage, and Brussels sprouts than in seeds. In dried leaves there is from three to six times as much ash as in seeds.

3. A large quantity of the ash may be lost if the vegetable is cooked in a large amount of
II. Composition and value in the diet (continued).

water and the water thrown out—with spinach as much as 50% of the iron may be lost. The figures used below assume that the vegetable is cooked without additional water or that the water is used.

G. Iron.

1. Need for iron. (See Sherman, *Chemistry of Food and Nutrition*, chap. II.)

a. It is one of the necessary constituents of the hemoglobin of the red corpuscles of the blood and of all other active cells.

b. Very little iron is stored in the body, so the supply must be kept up by getting iron from food. When there is little in the diet there may be a lack of hemoglobin and anæmia may result.

c. The quantity needed daily is probably about 15 milligrams. It is desirable for women and children to have as much as men in spite of their lower calorie requirement.

2. The iron content of some diets.

a. Approximate estimates of 150 American dietaries give 14 to 20 milligrams per man per day for the majority. "The typical American dietary does not contain any such surplus of iron as would justify the practice of leaving the supply of this element entirely to chance."

b. Of the 92 dietaries recently studied by Sherman and Gillett for the New York
II. Composition and value in the diet (continued).

Association for Improving the Condition of the Poor, a disturbingly large number, 33, showed less than 15 milligrams of iron.

c. Computations of the iron in the diet of a number of young women students has shown quantities very near the border-line.

3. Foods supplying iron.

a. Egg yolk, meat, whole cereals, and many vegetables are high in iron. Even the vegetables and fruits that are low in iron are often eaten in such large quantities that they furnish a good supply.

b. The compounds of iron in meat are probably not used as advantageously as those in eggs, milk, and vegetables.

c. Milk and some fruits and vegetables, and especially the cereal products made chiefly from the endosperm like white flour and polished rice, are low in iron. Fats and sugar contain no iron.

d. It is suggested that the class make a display of portions of food each containing, say, 2 milligrams of iron, so that 7 1/2 of the portions will contain enough for a day. Some portions containing 2 milligrams of iron:

- 200 grams of white flour, enough for 3/4 pound of bread.
- 40 grams of Graham flour, equivalent to 2 medium slices of bread.
II. Composition and value in the diet (continued).

22 grams of egg yolk, from 1 1/2 to 2 eggs.

50 grams, almost 2 ounces, of lean meat.

56 grams, 2 ounces of raw spinach, about 1/3 of a cup of cooked spinach.

A little over 1/3 pound of string beans, about 1 1/4 cups.

A third of a pound, one good-sized Irish potato.

Almost a pound of sweet potatoes.

2 1/4 pounds of oranges, 4 large ones.

810 grams of milk, almost a quart.

e. Note from these portions and others like them that the 15 milligrams is easily obtained if eggs, whole cereals, spinach, and many other vegetables are eaten, but that the iron may easily fall below on a diet consisting largely of white bread, sugar, fat, and certain fruits. A child eating large quantities of candy and white bread will not get enough iron or other mineral constituents.

f. A diet containing a large amount of vegetables, whole wheat bread, and the cheaper sorts of fruits, with milk but without meat, was tried in an experimental study in New York and resulted in a gain of 30% in the iron of the diet while the protein, fuel value, and cost remained practically the same as in the ordinary mixed diet.¹

¹ Sherman, H. C. Chemistry of Food and Nutrition, p. 308. Macmillan, 1918.
II. Composition and value in the diet (continued).

H. The basic residue.

The ash left when foods burn in the body is either basic or acid in character. It is probably desirable to have the residue from the whole diet basic. Meats and cereals give an acid residue, vegetables and fruits a basic residue. Therefore, the eating of vegetables with meat is a wise habit. Eating bread or rice with meat does not serve the same purpose.

I. Vegetables as a source of vitamins.

1. Water-soluble B is fairly widely distributed in most of them.

2. Fat-soluble A is not so widely distributed.
   a. The leafy vegetables contain it. Their value is in part due to its presence.
   b. Most seeds have very little of it. It is present in the germ of the seed, but is practically absent from the endosperm. Hence beans and peas need to be supplemented by leafy vegetables or milk.
   c. Tubers and roots are more like seeds in this respect than like the leaf vegetables.

J. Summary of the value of vegetables and fruits in the diet.

1. They give a pleasant and varied flavor and texture.
2. They supply the much-needed ash constituents, especially the leafy vegetables.
3. They supply vitamines, the leafy vegetables
II. Composition and value in the diet (continued).

especially supplying the less widely distributed fat-soluble A.

4. Some give considerable fuel, and legumes considerable protein, thus serving in part as substitutes for both wheat and meat.

5. They give a desirable bulk to the diet.

6. The leafy vegetables (with milk) should be looked upon as protective foods which can correct the deficiencies found in most of the other foodstuff. This “protective” character of milk and the leafy vegetables “should form the main thesis of the teacher of nutrition and dietetics.”

III. Use of vegetables and fruits instead of the staples needed abroad.

A. To save wheat: The potato drive to use the surplus of the huge 1917 crop has fixed in every one’s mind the interchangeableness of these two foods. One medium-sized potato supplies the same number of calories as a large slice of bread and contains more mineral salts than white bread. Sweet potatoes are equally good instead of wheat.

B. To save meat: Use legumes. Use all the vegetables as “meat extenders” in stews like the French “pot au feu” and in meat pies.

C. To save sugar: Use fruit, fresh and dried; dates, figs, raisins, and prunes are among the sweetest.

III. Use of vegetables and fruits (continued).

D. To save fat: Use jam. It has high fuel value and is a "spreading material" like butter. It is part of the ration of British soldiers.

IV. Do we eat enough vegetables?

A. Workers among the very poor of our cities almost always have to urge a greater use of vegetables.

1. The New York Association for Improving the Condition of the Poor recommends: "Spend not more for meat and eggs together than for vegetables and fruits."

2. In the Boston study the expenditures for meat, fish, and eggs taken together, was generally at least twice as much as for fruit, fresh vegetables, and potatoes.

3. In a negro community in New York City that has the highest infant mortality rate of any community in the city, the diet of 75 mothers was observed in the fall of 1916 and winter of 1917. They ate vegetables on the average only twice a week and fruit about the same number of times.¹

B. Many young people "do not like vegetables" and must deliberately cultivate a taste for them.

C. Many adults could improve the flavor and nutritive efficiency of their diet by increasing the vegetable content, and at the same time substitute these perishables for a large proportion of the wheat and meat.

V. Increasing the production of vegetables.

A. The 1917 war gardens.

1. The response of both professional and amateur gardeners last spring and summer to the imperious need for increasing the food supply was one of the country's significant contributions to the war.

2. A few examples of the response to the appeal in 1917. These are merely illustrative of what occurred throughout the country:

a. The school gardens. They are of particular value, not only because of the food grown, but because of the valuable lessons taught.

(i) The Food Production Committee of New Hampshire found that high schools of that State produced $36,610 worth of vegetables. The grade schools maintained 17,000 gardens, the value of their output not being recorded.

(ii) A systematic survey of Indiana discovered 500,000 gardens maintained by children or young people throughout the State.

b. City efforts.

(i) A permanent committee on home gardening was maintained in Los Angeles; 8,000 acres were put into war gardens in and about the city.

(ii) New York maintained a Food Committee and utilized at least 12,000 city lots in war gardens.

(iii) Interesting community experiments were tried at Denver and Cleveland. In Cleveland, the Mayor's Advisory War Committee advertised for lots and gardeners. They set an official planting day for the entire city. Financial aid was given to gardeners in need of seed and tools, and a soil and production expert and a corps of assistants were maintained by the city to super-

V. Increasing the production of vegetables (continued).

intend and correlate all efforts. It is estimated that $300,000 worth of vegetables were grown.

(4) One interesting garden was made under great difficulties by the employees of a copper mine in Arizona. They were from many countries and few spoke English. The region was arid and five artesian wells had to be drilled to supply the water for irrigation. Double crops were obtained and the food that could not be used at once was dried or canned.

(5) About 3,000,000 gardens were planted aside from the increased acreage planted by farmers. Vegetables estimated to be worth $350,000,000 were raised. The value of the produce of home, school, and children’s gardens alone was estimated at $100,000,000.

B. The increasing need for gardens.

1. The food situation abroad grows worse as the war progresses, so the burden on us becomes heavier. More and more the railroads must be kept free to rush coal, munitions, and all the supplies of war from one part of the country to another. Local food supplies relieve transportation difficulties. Make your neighborhood self-supporting. The war garden offers an opportunity for service within the reach of every one with a plot of ground and the willingness to work.

2. Intelligent care is of great importance.

a. Seeds and fertilizer are scarce; therefore plant only as much as can be properly cared for and choose the vegetables which can best be raised in your region. Get expert advice.
V. Increasing the production of vegetables (continued).


c. Consider the value of a community garden for your neighborhood rather than a series of private gardens or as a supplement to them. Experience has shown that labor-saving implements and better tools can usually be bought by the larger organization and expert superintendence employed to greater advantage.

C. The war gardens in the United States are not the only ones. The American Army Garden Service is planning truck gardens in France to supply our troops with fresh vegetables in the summer. Great Britain has ordered all her unused lands to be placed under cultivation. The Woman's Auxiliary Army Corps of England is planting similar gardens back of the lines to supply the English troops. At one of the great munitions factories in England employing thousands of people, a hundred acres of the surrounding waste land are intensively cultivated, so that the employees are entirely self-supporting as regards vegetables. In 1917 the French army fed many of their men from similar gardens.

D. War work of women on farms.

1. Continental Europe. Women have always worked in the fields and of course have been doing so in increasing numbers since the war.

2. England. About a quarter of a million women from every profession and class are doing all kinds of farm work. They met with opposition from the farmers for the first two years of the war, but they have dispelled prejudice by their good work and by the fact that the male labor simply could not be secured. In many cases the women are given a short preliminary training. The
V. Increasing the production of vegetables (continued).

movement is under the direction of the Board of Agriculture.

3. Canada. Both British Columbia and Ontario successfully organized groups of women for farm work last summer. The care of the girls was undertaken by the Y.W.C.A.

4. United States.

a. The movement was started in 1917 by Vassar College students who for two months successfully did all kinds of work on the college farms. Nine units were organized by the Mayor's Committee of Women on National Defense, New York City. Eight units worked in fruit-growing districts. The Mt. Kisco unit was the largest, consisting of 73 women, most of whom were college girls, though various trades and professions were represented.

b. In 1918, the Woman's Land Army of America carried on a vigorous campaign to enlist women in farm work and to overcome the prejudices of farmers against employing them. For information write to their headquarters at 32 Fifth Avenue, New York City.

VI. Preservation of vegetables and fruits.

A. Kinds of spoilage.

1. The less important kind is a mere deterioration of flavor after picking. This is brought about by normal processes in the plant. The change goes on more slowly if the food is kept cold, and is checked if the food is cooked. Therefore products canned as soon as possible after picking give the best-flavored product.

2. The more important decomposition is caused by micro-organisms, bacteria, yeasts, and
VI. Preservation of vegetables and fruits (continued). Molds. These come from the soil, fertilizers, dust, the hands of workers, etc. Their character may depend upon many variable factors such as rainfall, temperature, geographical distribution, the kind of vegetable, and the length of time and method of keeping after picking. The question is more complicated than is often realized.

B. Methods of preventing spoilage by destroying the micro-organisms or preventing their activity.

1. Refrigeration.

2. Removal of water. A certain amount of water is necessary for the growth of bacteria. Therefore, dehydration is a satisfactory method of preventing spoilage. (See section E, p. 215.)

3. Adding substances in which micro-organisms cannot grow.

a. Salting.

This method is applied to meats and some vegetables, especially string and wax beans, spinach, greens, and corn.

(i) Dry pack.

(a) With only a small amount of salt, 2% to 3% of the weight of the vegetable. This allows a certain degree of fermentation to occur. The best known product of this method is sauerkraut.

(b) With enough salt (25% of the weight of the vegetables) to prevent fermentation or growth of yeasts and molds. Dandelions, beet tops, spinach, cabbage, string beans, peas, and especially corn, are satisfactorily
VI. Preservation of vegetables and fruits (continued).

preserved by this method. All except corn are salted without cooking. Salted corn may be cooked on the cob to set the milk, then cut and packed with one-fourth of its weight of fine salt.

(2) Wet pack.

It is sometimes found more satisfactory to use a 10 % salt solution, about 6 tablespoons of salt to 1 quart of water, for salting some vegetables, especially cucumbers.

(3) These methods require little time, small expense for fuel and containers, and the products are easy to store. But there is a change in flavor and a loss of nutrients in the brine.

b. Pickling. Vinegar, salt, and spices are the preserving materials. The method is applied chiefly to cucumbers, onions, greens, and tomatoes.

c. The addition of “preserving powders” or chemical preservatives. While some of the substances are probably harmless, others are not, and their use should not be considered in the home.

d. “Preserving” and making jelly and jam. The preservative is the strong sugar solution.

e. Canning. This involves destruction of microorganisms by heat “processing” and their subsequent exclusion.

C. Commercial canning.

1. Importance.

a. “Canning, more than any other invention since the introduction of steam has made possible the building up of towns and communities beyond the bounds of varied production.”

b. A century or two ago men on whalers after a voyage of a year or two often came home with scurvy. Nansen and his men drifted in the Arctic ice for

VI. Preservation of vegetables and fruits (continued).

years and remained in good health because of their supply of canned vegetables, fruits, and meats.

c. This comparatively cheap, convenient method of preservation removes any limitations of time or distance upon the consumption of fruits and vegetables in an attractive form. It affords a market for a large crop of such a perishable article as peaches and offers a convenient form to transport large quantities of such fruits as Hawaiian pineapples.

d. Especially important now because of the value of canned vegetables and fruits in feeding the Army and Navy. They give variety to the meals and keep the men in good health. Their use prevents scurvy on board ships and in the Army when fresh vegetables cannot be obtained.

(1) The Army and Navy commandeered about 25% of the canned beans, 12% of the corn, and 18% of the tomatoes of the 1917 pack. Large amounts will be needed this year also.

(2) To supply our troops in France next winter, the Government has entered into an agreement with the French Government by which our armies are to be supplied with vegetables and fruits canned in France. The shipping space thus saved will be considerable.

e. A large amount of our products were also exported in 1917 to the Allied Governments.

2. Extent of the industry.

a. The United States is the largest producer and consumer of canned goods in the world, and the value of the output is increasing. In 1914 the value of the canned vegetables and fruits was $117,000,000. The value of the vegetables was almost four times that of the fruit. The pack of vegetables had increased 84% in value, and of fruit, 112% over 1904. The quantity packed had almost doubled. The 1917 fruit pack, with the exception of apples and berries, showed an increase.
VI. Preservation of vegetables and fruits (continued).

b. The most important fruits packed are peaches, pineapples, and cherries, in the order named. Of the vegetables, tomatoes come first, corn second, and peas and beans third. The industry is widely distributed.

c. California produced 64.2% of the total value of the fruit canned in the United States.


a. Grading is done at each step in order to insure uniform, standard products.

b. Preparation of the material for sterilization.

Much of the work is done by machinery. Most of the vegetables and some of the fruits are “blanched”; that is, kept in boiling water from 1 to 15 minutes to soften and also to remove the objectionable gummy substance from the surface of some vegetables. The cans are filled with vegetables by machinery, or, with the higher grade of fruits, by hand to prevent crushing, and the brine or sirup is added. The cans are “exhausted”; i.e., some of the air is removed. They are then sealed and sterilized or “processed.”

c. Processing.

Two factors are involved in processing. The temperature must be high enough to destroy all the micro-organisms, but it must not be too prolonged or too high, or the taste and appearance of the product will be injured. Fruits do not need a temperature above the boiling point and they are generally sterilized in water baths. Vegetables need a higher temperature and the cans are usually heated in steam under pressure in autoclaves.

D. Home canning. (For definite directions see the Laboratory Manual, section VII.)

1. All who can get fresh vegetables should can or otherwise preserve enough to supply the
VI. Preservation of vegetables and fruits (continued). The needs of their families during the winter in order to make their family and community self-supporting as far as possible and thus decrease the demand on transportation and supplies; to preserve the excess products of the growing season for future use; to add variety to the winter diet and furnish a liberal supply of mineral-containing food.

2. It is of doubtful policy, unless a market is secured beforehand, to can large quantities for sale.

3. Community canning is likely to be superior in results to canning in private kitchens. (See chapter XV.)

4. There are a number of different methods, the relative values of which have been debated at considerable length, so that students may be familiar with all of them.

a. Open kettle. The old-fashioned method still used somewhat for many fruits and for acid vegetables.

b. One-period processing in the jar, usually at the temperature of boiling water. It is commonly known as the cold-pack method, though the term might be equally well applied to method c.

c. Intermittent processing in the jar. A longer method, but preferred by many people for such vegetables as beans, peas, and corn.
VI. Preservation of vegetables and fruits (continued).

d. Processing at higher temperature by use of the pressure cooker.

5. A few important points in regard to processing:

a. Most bacteria, yeasts, and molds are easily destroyed by heating to 100° C. or even to a considerably lower degree. There is a variation in resistance among different kinds of bacteria and even among different strains of the same kind.

b. Some kinds of bacteria produce spores which are resistant to heat unless the heating is long continued or higher than 100° C. Otherwise the spores may develop into active bacteria after the food is cool. Spores of some species of bacteria have been known to resist boiling for five hours. In order to destroy spores, heating on a second or third day is often resorted to — intermittent heating.

c. Destruction of bacteria is made easier by the presence of acid, salt, and sugar. For this reason canning fruits and vegetables like tomatoes and rhubarb is easier than canning the non-acid ones.

d. The vegetables with comparatively small surfaces exposed to bacterial contamination, like beets, seem to be easier to can than those with more surface, like asparagus. Removal of the skin before canning also seems to help.
VI. Preservation of vegetables and fruits (*continued*).

e. The way the food is packed in the jar makes a great difference in the length of time required for processing.

(1) Heat penetrates only slowly into a mass of vegetables or fruit. This is one of the most important points to understand for successful canning. There may be entire failure to get the interior of a jar hot enough to destroy the bacteria present.

(2) Heat penetration is quicker when there is free circulation of liquid than when the food is very closely packed. The commercial canner often agitates his cans during processing to bring about this circulation.

(3) In some experiments of Bitting’s in a pressure cooker it took an hour for the center of the can of dry, tightly packed corn to reach the temperature of the outside water bath. A can of peas with the large amount of water usually packed with peas was heated in 6 or 7 minutes.

(4) Pumpkin and squash, with their pasty, semi-solid consistency, also require a long time for heat to penetrate, and heavy tomato pulp takes longer than tomatoes surrounded by liquid.

(5) Air is also a very poor conductor of heat. Therefore care must be taken to
VI. Preservation of vegetables and fruits (continued).

have the cans filled to the top with liquid.

(6) For successful canning, therefore, pack the jars full, but have plenty of liquid, or else continue their processing longer.

f. For proper penetration of the heat to the contents of a jar, the water in which the jar is placed should come almost to the top of the jar and the water bath should be tightly closed.

g. Quick cooling following the processing is desirable.

6. Changes brought about in canned food when processing is insufficient.

This subject is not completely understood. If sterilization is not completed and the conditions are favorable for spoilage, the canned goods will not keep. Substances with disagreeable flavors and gaseous products may be formed or acids without gas (flat sour). In rare cases, poisonous products may be formed.

E. Drying.

This is probably the oldest method of preservation. It was extensively used in the farm home before transportation facilities made the shipments of fresh fruits and vegetables easy.

1. Two methods are employed:—

a. Outdoor drying, which is used so extensively in California.
VI. Preservation of vegetables and fruits (continued).

b. Dehydrating vegetables and fruits by artificial heat both commercially and in the home.

2. Advantages.

a. Keeping qualities. The dehydrated vegetables and fruits if stored in suitable containers seem to keep indefinitely. Some vegetables dehydrated for use in the Boer War were not all used; at the beginning of the present war the barrels were opened and the vegetables were found to be in excellent condition and were used by the English Army in 1914.

b. Transportation. The saving in freight charges, cars, and shipping is obvious when it is remembered that fresh vegetables and fruit often contain over 90% water and, when dried, only from 8% to 10%. This fact is of the greatest importance now.

c. Containers. If the products are not to be exported, metal or glass containers are not necessary. Pasteboard boxes, stout paper bags, or paraffin paper cartons can be used. It is only necessary to keep out dust and insects.

d. Economy. A great possibility for national saving, making use of the vegetables that might otherwise spoil on the farm and in the market.

e. Cost of dried fruits to the individual. The actual cost of a pound can of vegetables
VI. Preservation of vegetables and fruits (continued).

or fruits may be less than the cost of a pound of dried fruit; but when the amount of water in the can and in the fruit or vegetable is considered, the dried product is much cheaper, though more labor is required to prepare it for the table. A 100-calorie portion of dried split peas costs on an average about 1 cent and of canned peas, a little over 5 cents. The cost of a 100-calorie portion of evaporate peaches is 1 1/3 cents and of canned peaches 6 1/4 cents.¹

F. Commercial dehydration.

1. Commercial dehydration received its impetus from an endeavor to supply vegetables to men who were cut off from fresh supplies. The Hudson Bay Company bought dried vegetables for the use of its men in the long winter trapping season. Later, vegetables were dried for the New England fishing fleets, and in Oregon some were dried for the Alaska miners. Vegetables were also dried for the men in the Spanish War. The early products in many cases were not very good—they did not “come back” properly in water.

2. Present situation in the United States.

a. The process has been brought into prominence by the war. The need for utilizing every ounce of food, the shortage of tin containers, transportation difficulties, and the sugar shortage combined to bring this method of preservation to the front.

b. Investigations have been conducted by private concerns, universities, and the Bureau of Chemistry of the United States Department of Agriculture, and excellent methods have been worked out, by which distinctive flavor and texture are retained. These methods are now being used by a few concerns.

¹ These prices are averages given in the American Food Journal, February, 1918.
VI. Preservation of vegetables and fruits (*continued*).

Others put out an inferior article. There is need for standardization.

c. The Government has placed orders for several thousand tons of dehydrated potatoes for the use of the Army and will probably use other dried products also, as they can be obtained.

3. In the approved method, vegetables such as potatoes and carrots, and fruits such as apples, are pared and sliced. They are then blanched in steam and dried in a current of air at a temperature between 110° and 140° F. Tomatoes are dried and ground and used in hotels for soups, sauces, etc. A combination of certain dried vegetables is known as "soup mixture." Even corn on the cob can be dried if the pith is removed.

4. The value of the product depends on the care with which the above processes are carried out. The vegetable or fruit must be dry enough to arrest the growth of molds and bacteria, but not too dry or dried too rapidly, so that the cellular structure is broken down. The water content should be from 8% to 10%.

5. The process is used to a much greater extent abroad than in the United States.

a. It is widely used in Germany. Before the war there were about 500 commercial plants, and in 1917 there were over 2000; 37,000,000 hundred-weight of potatoes alone were dried in 1916.

b. Canada has sent abroad within the past three years over 50,000,000 pounds of dehydrated vegetables, about two-thirds of which was the vegetable soup mixture, and one-third dried sliced potatoes. When reconstituted this would make about 400,000,000 pounds of vegetables.

G. Home drying.

1. The process has been in use for generations on farms. The methods were crude and some of the products were probably much inferior to those dried by the best modern methods.
VI. Preservation of vegetables and fruits (continued).

2. Within the past year it has been reintroduced as a home industry. Excellent results can be obtained, but care and skill are necessary. Too little drying or too much results in the product’s molding or not “going back” properly when soaked.

H. Community drying plants.

A more efficient and convenient outfit can be bought if a number of people combine and the cost of using it will be nominal. The drying must be accompanied by instruction on the necessity of long soaking of the product before cooking.

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