THE ASCORBIC ACID CONTENT OF OKLAHOMA HOME CANNED PEACHES

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Ascorbic acid, more familiarly known as vitamin C, is of considerable interest both because of its value to the body and because of its sensitiveness to heat and oxidation. It is best known for its prevention of scurvy. While it is true that we do not have many cases of this disease in this country, for our diets are not completely lacking in vitamin C, still we do have conditions due to insufficient amounts of this vitamin. Some authorities feel that fleeting pains in the joints and limbs, often called rheumatism, pyorrhea, muddy complexion, loss of energy, goiter, gastric and duodenal ulcer, anemia, capillary fragility, etc. are caused by too little of this vitamin.

Because vitamin C is soluble in water and is sensitive to heat and oxidation, considerable of it may be lost or destroyed in cooking. Whether much of it is retained in canning is an important matter, for many families use considerable canned goods, especially home canned foods. As canned peaches are popular in our State, their vitamin C value is of significance.

The home canned peaches used in this study were grown and canned in northeastern Oklahoma. Early Hale and Elberta peaches, popular varieties in this State, were canned, chiefly by the open kettle method, the one most used in Oklahoma. A few jars were preserved by the water bath method and a few in the oven. Five different brands of commercially canned Elberta peaches were also tested.

For determining the ascorbic acid content, extracts from each jar were tested by means of the chemical titration method.[1] Weighed samples of peaches and juice from each jar were macerated, mixed with hot 8 per cent acetic acid and centrifuged. The supernatant liquid was decanted, more hot acetic acid added and the mixture centrifuged. This process was repeated a second time and to the combined extracts 2 per cent metaphosphoric acid was added to stabilize the solution. Immediately after making this mixture up to volume, 5 cc. portions were titrated against a solution of definite strength of the dye 2, 6-dichlorophenol indophenol, until a faint pink color which remained at least one minute was obtained. At least three tests were made on each sample and two samples were taken from each jar. Tests were made as soon as the jars were opened and after the fruit had stood in covered glass jars twenty-four hours. Eleven jars of home canned fruits and five cans of commercially canned peaches were tested.

For the daily standardization, freshly expressed lemon juice plus one cubic centimeter of one per cent starch paste was titrated with 0.01 N iodine solution until a permanent blue color was obtained. Similar samples of the lemon juice were immediately titrated with the dye. As each cubic centimeter of the iodine solution is equivalent to 0.88 milligram of ascorbic acid, the amounts in the various samples of the peaches can be calculated. Since ascorbic acid is easily oxidized and is affected by certain metals, precautions were taken to avoid any losses. Water distilled in glass and then boiled in glass just before using to drive off any CO_2 present was used, no metal touched the fruit except the knife used in cutting the lemon, and both acetic and metaphosphoric acids were used. All food samples and reagents were weighed on analytical balances. As

the aqueous solution of the dye is unstable, no solution more than three days old was used. The solution had phosphate buffer solution added and was kept in a dark bottle until used.

In general the Elberta peaches were slightly higher in ascorbic acid than the Early Hale variety and the commercially canned ones were higher than the home canned peaches. These fruits were also compared with fresh Elbertas and white clings previously tested. The fresh Elbertas were five times as rich in ascorbic acid as the white variety or the commercially canned peaches, about ten times as rich as the home canned Elbertas and approximately twenty times as rich as the home canned Early Hale peaches. (Table 1)

TABLE 1

The ascorbic acid content of some fruits.

Fruit	Mg. Per Gram	
	Fresh Fruit	Canned Fruit
Elberta Peaches	0.0312 (1)	0.0023 (2)
White Cling Peaches	0.0060 (1)	
Early Hale Peaches		0.0016 (2)
Elberta Peaches (Commercially Canned)		0.0062 (2)
Lemons	0.4550 (1)	
Oranges	0.5000 (1)	0.2940 (1)
Pineapple	0.3100 (1)	0.0070 (1)
Tomatoes	0.1570 (1)	0.2420 (1)

(1) Earlier study.
(2) Present study.

Of the home canned peaches, those heated in the water-bath had the highest ascorbic acid value and those canned by the open kettle method the least. This is logical for in the open kettle method there is more chance for oxidation to take place. It was also noticed that peaches that were improperly canned and thus had not kept so well and those that were somewhat green and had to be cooked longer before canning had less vitamin C than the other cans. However, as the number of jars of these particular types was very small, one really cannot draw conclusions.

The effects of standing twenty-four hours were variable as part of the fruits seemed to gain while the rest lost some of the vitamin. Averaging the results, the Elbertas and the commercially canned peaches lost a slight amount of ascorbic acid while the Early Hales apparently gained a very little.

Canned peaches, whether home or commercially prepared, are less satisfactory sources of vitamin C than other fruits (Table 1). A serving of Early Hale peaches, 213 grams, contains 0.341 milligram or about seven units of ascorbic acid, Elbertas, 0.49 milligram or ten units and the commercially canned 1.32 milligrams or twenty-six units. While these values are considerably less than those for fresh oranges or lemons, still since canned peaches are often a staple article in the diet of some families they do furnish at least some vitamin C. Probably families should try to can the Elbertas rather than the Early Hales, for in that way more of this important vitamin can be added to the diet.

REFERENCE

1 Bessey, Otto A., and King, C. G. The distribution of vitamin C in plant and animal tissue, and its determination. J. Biol. Chem. 103, 687-98 (1933).