

MINERAL CONTENT IN FRUIT JUICES

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According to Sherman in "Chemistry of Food Nutrition," mineral or inorganic elements are those elements which are found to remain either wholly or largely in the ash of food materials when the latter are burned in the air.¹

The mineral elements in the body that are of great importance are calcium, iron and phosphorus.

The general functions of the mineral elements in the body are threefold:

(1) As constituents of the bones and teeth, giving rigidity and relative permanence to the skeletal tissues, as the elements calcium and phosphorus.

(2) As essential elements of the organic compounds which are the chief solid constituents of the soft tissues (muscles, blood cells). Both iron and phosphorus may come under this function.

(2) As soluble salts (electrolytes) held in solution in the fluids of the body, giving these fluids their characteristic influence upon the elasticity and irritability of muscle and nerve, supplying the material for the acidity or alkalinity of the digestive juices and other secretions, and yet maintaining the approximate neutrality of the body's fluids as well as their osmotic pressure and solvent power.¹

Calcium constitutes a larger proportion of the body weight than does any other of the "inorganic" elements. The "ordinary mixed diet" of Americans and Europeans, at least among dwellers in cities and towns, is probably more deficient in calcium than any other chemical element.

Although the amount of iron contained in the body is small—hardly one tenth of an ounce in the entire body of a full grown person or about 0.004 per cent—its functions are of the highest importance. Iron stands in the closest possible relation to the fundamental processes of nutrition. Although iron occurs in meats (the muscle part) eggs, milk, grain products, vegetables and fruits, we will stress its presence in fruit juices.

Phosphates are utilized in maintaining the acid-base balance of the blood and in the synthesis of important cell constituents.

It has been found in the experiments of Sherman and Howley that a child needs for optimal growth and development about one and one half times as much phosphorus as is needed by a full grown man for maintenance.

In our problem, we determined by various methods, the nutritive content of fruit juices in regard to the amount of calcium, iron, and phosphorus they contained. The fruit juices tested were tomato, orange, grapefruit, and pineapple. The results have been checked with "Chemistry of Food and Nutrition" by Sherman and also data supplied by the United States Department of Agriculture, Bureau of Home Economics.

Mineral Content of Fruit Juices
(per cent)

JUICES	Ca	P	Fe
Tomato.....	0.006	0.015
Orange.....	0.029	0.016	0.00024
Grapefruit.....	0.015	0.014	0.00023
Pineapple.....	0.015	0.021	0.00025

Calcium was determined gravitometrically by the oxalate method, phosphorus, volumetrically by the molybdate method, and iron was determined colorimetrically.

Even though the percentages of iron are comparatively small, when we remember the small amount of iron in the body (tenth of an ounce) we can see that the appreciable amount of iron in juices would be a big help in supplying the iron content for the body.

Present day nutrition, it has been said, offers an extra ten years to the life of anyone who lives under its guidance.² Since the war and food rationing has begun, constant efforts have been made to maintain the proper diet containing the necessary vitamins and minerals.

Food fads and follies have been exposed. Journals have been trying to tell

the story of good nutrition from every possible point of view yet regardless of every effort that can be made, there are great numbers of Americans who still eat much more from the point of view of appetite than of foods necessary to health and growth.

To summarize briefly this report on the nutritive content of fruit juices, we conclude that both vitamin C and the minerals calcium, iron and phosphorus are present in tomato, orange, pineapple and grapefruit juices.

We know now that Vitamin C not only protects us from scurvy but has important functions also in normal nutrition and in maintenance of a high level of positive health. The minerals may also be included under the phrase—"necessary for normal nutrition."

BIBLIOGRAPHY

1. Sherman, *Chemistry of Food and Nutrition*. MacMillan Co., 1933.
 2. *Hygeia*, Feb., 1942, p. 123.
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