

## What Counts? Nutrients in Fresh and Preserved Fruits and Vegetables

A healthy diet includes a variety of fruits and vegetables. While many are consumed raw, others (such as tomatoes, snap beans, corn, peaches, nectarines and pineapple) are often consumed in a processed form (Barrett, 2007).

The Fruit & Veggies - More Matters™ campaign promotes consumption of all forms. Whether they're frozen, fresh, canned, or dried, all fruits and vegetables (including beans) count toward your daily amount (CDC):

Fruit equivalents: 1 medium piece, ½ cup cut-up raw or cooked, ¼ cup dried or ½ cup 100% fruit juice.

Vegetable equivalents: ½ cup cut-up raw or cooked; ½ cup cooked dry beans or peas, 1 cup leafy salad greens, or ½ cup 100% vegetable juice.

Nutrient dense forms are preferred. Adequate fiber and limited added sugar/caloric sweeteners, fat and sodium are specified for Fruits & Veggies – More Matters™ branding.

Fruits and vegetables are sources of many nutrients needed for good health including fiber, minerals (e.g., potassium), and vitamins (e.g., A, C, and folate). Many factors affect the nutrient content. These include cultivar, growing conditions, post-harvest handling, preservation, and home preparation.

Key nutrients in fruits and vegetables are unstable under certain conditions:

	Acid (<pH 7)	Oxygen	Light	Heat
Vitamin A	U	U	U	U
Vitamin C	S	U	U	U
Folacin	U	S	U	S
Mineral salts	S	S	S	S

S= Stable (no important destruction) U=Unstable (significant destruction)

Source: Effects of Food Processing on Nutritive Values. Food Technology, December, 1986.

Uncooked fruits and vegetables eaten soon after harvest have the highest nutrient content. Raw is not necessarily the most nutritious, however. Nutrients decline post-harvest. There will also be nutrient loss during food preparation and preservation. Preserving quickly helps to retain nutrients.

Nutrient loss occurs during all types of preservation. Blanching vegetables (to destroy enzymes) before freezing and drying reduces the amount of heat-sensitive and water soluble vitamins to some degree. The heat of canning leads to nutrient loss.

There could be some nutrient loss if canned and dried food is stored at high temperatures. Temperature fluctuation during frozen storage causes nutrient loss.

The most important consideration is nutrient content at time of consumption. Heating frozen vegetables before eating will reduce heat-sensitive nutrients. Water soluble nutrients are lost if syrup or brine in canned fruits and vegetables is discarded.

Vitamin losses during preparation and preservation can range from 0 to 100% depending on the vitamin and the conditions. Vitamin C is the most likely to be lost. Research is needed to make side-by-side comparisons of nutrient losses from fresh, frozen, canned, and dried forms of the same fruit or vegetable.

To maximize nutrient retention, handle fresh and preserved fruits and vegetables carefully:

Raw: Refrigerate, if required, and use soon.  
Buy local to prevent nutrient loss during shipping.  
Cook raw vegetables in a small amount of water.

Canned: Store in a cool, dark place.  
Use the brine/syrup in canned produce.

Frozen: Use freezer packaging and minimize frozen storage time.  
Prevent fluctuations in home freezers (such as “frost-free” freezers).

Dried: Store in a cool, dark place.

References:

Barrett, Diane. Maximizing the Nutritional Value of Fruits and Vegetables. Food Technology, April, 2007.  
<http://members.ift.org/IFT/Pubs/FoodTechnology/Archives/>

CDC. How many fruits and vegetables do you need?

USDA, MyPyramid. 2005.

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**The Food Stamp Program can help you buy nutritious foods. Call Oregon SafeNet at 1-800- 723-3638 or (503) 988-5858 in the Portland metro area.** This material was partially funded by USDA's Food Stamp program. In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, religion, sex, sexual orientation, national origin, age, marital status, disability, or disabled veteran or Vietnam-era veteran status. Oregon State University Extension Service is an Equal Opportunity Employer

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