



The DIRT Society

Nutrient Loss in Food Processing

It may come as no surprise that produce becomes less nutritious with almost every step of processing. When a fruit or vegetable is harvested ripe, it contains a certain quantity of nutrients.

If it is peeled, cored, roasted, dehydrated, broiled, boiled, canned, refrigerated or frozen, the original raw material suffers a reduction in vitamins and minerals. The more processing it undergoes, the greater the quantity of nutrients lost.

What does that mean to a consumer? First of all, it should illustrate the differences between packaged and fresh produce. Once peas have been shelled, freeze-dried, stuffed into modified atmosphere packaging, shipped, shelved, bought, stored, thawed, fried, refrigerated as leftovers, reheated and eaten, they are no longer comparable in quality or content to a freshly harvested peapod.



If you want to eat nutritious vegetables, you need to eat them while they are the closest they can possibly be to still living.

There are other things you might consider when purchasing or processing produce. For example, a handpicked lettuce grown close to home requires very little transportation and, likely, no packaging of any kind. That means that buying fresh fruits and vegetables has a smaller detrimental impact on the environment.

Furthermore, with every step of processing prior to purchase, someone must be paid for their contribution. When you buy a bag of frozen peas, you are paying very little to a farmer. More of your money will be divided among shippers, processing plants, distributors, advertisers, and the store from which you buy the product. So you're paying **more** for **less** of the desired nutrients.

This isn't to say that cooking and preservation are completely undesirable. Proper food processing can save money and reduce waste by allowing consumers to store fruits and vegetables before they spoil. Some methods, however, are more efficient than others.

Below are some of the most common methods of processing produce. These are arranged in the order of increasing nutrient loss. This list is a generalization, as different nutrients are lost in different ways.

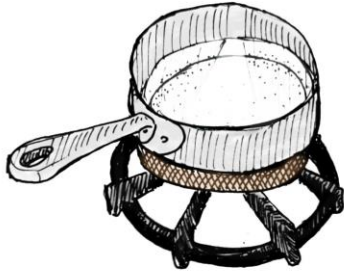
Sprouting adds nutrients in some cases, though it may negatively affect flavor or texture. This process revives a harvested crop and encourages it to grow once more; thus providing very fresh and nutrient-rich food.

Freezing will preserve nutrients and halt the growth of bacteria. However, preparation prior to freezing can remove a great deal of the original vitamins and minerals, and a notable loss of flavor and texture will result once the food has been thawed.

Cutting, whether it is slicing, coring, peeling, etc., will physically remove nutrients. Either they are intentionally discarded (as in removing stems, spots, or seeds) or unintentionally lost during the removal process (as in juices).

Blanching is an effective way to halt the enzymatic breakdown of raw foods. Some nutrient loss is normal, as many vitamins are water-soluble and will be lost in boiling.

Dehydrating fruits and vegetables will result in the concentration of some nutrients and the loss of others. While overall calories by weight will increase, some loss occurs due to hot air and pretreatments.



Boiling vegetables will cause nutrients to leach into the water bath and degrade due to heat exposure. In some cases, such as with soups, the broth and vegetables are both consumed and fewer nutrients are discarded.

Cooking produce could mean frying, grilling, broiling, or any number of heat treatments. In general, each of these will break down the structure of fruits and vegetables. This is intentionally done, as the breakdown results in desirable flavors or textures. However, nutrient loss is high. More vitamins and minerals are available if the finished product has not been drained or strained.

Refrigeration is an excellent method by which food can be kept palatable. If you are trying to preserve nutrients, however, storage in a refrigerator is a poor option. Exposure to mild temperatures and circulating air will result in an enormous loss of vitamins and minerals over time. It is best to consume fresh vegetables as quickly as possible, without using refrigeration as a long-term storage solution.

Canning will allow you to preserve your produce for a considerable amount of time, and can develop flavor in interesting and desirable ways. However, it could mean sacrificing a good deal of nutrients. To can produce, the food must be scrupulously cleaned and prepared, treated with heat and additives, and aged. Each step removes nutrients from the raw whole, meaning that the resulting canned produce not only tastes different; it is structurally different as well.

An exception to the rule: Rinsing and peeling vegetables is an easy way to prevent the absorption of minerals like lead, which may be found in the soil, or unwanted microorganisms on the food's surface. Produce should always be cleaned prior to processing or eating, though how intensely will depend on various factors such as source, storage, and the consumer.

In general, nutrient loss will begin once a fruit or vegetable has been harvested. The loss is natural, continuing over time, but can be hastened by processing. The best possible nutrient profile that fruits and vegetables can achieve is that which they have while fresh.

