



Food Guide

Is Local Produce More Nutritious?

This is one of the most frequently asked questions about eating produce that is grown and processed locally. While it would be nice to be able to claim nutritional superiority of locally produced foods, the answer is not that simple. The nutritional value of fruits and vegetables is influenced by climate and environmental factors (such as light, temperature, rainfall, season, location, altitude, and soil fertility); crop maturity; varieties; and agricultural, handling, transportation, storage, and distribution practices.

Quality of Fruits and Vegetables

Fruits and vegetables that are allowed to reach their peak ripeness are likely to have the best quality. "Quality" of fresh produce is an elusive concept but can be described by four basic characteristics: color or eye appeal; taste and smell; texture or feel; and nutrient content. The first three characteristics can be evaluated by human senses and have the greatest chance of being at their peak if the product is allowed to ripen fully, is handled carefully after harvest, and reaches the consumer in the shortest possible time. In addition, fruits and vegetables that are frozen or canned when they have achieved their peak quality will likely result in the highest-quality processed products. This situation is most probable when produce is consumed or processed near the place it is grown. Because we are likely to consume greater numbers of fresh fruits and vegetables when they are of the highest quality, locally produced foods stand to improve the nutritional quality of total dietary intake regardless of differences in

nutrient content of a particular fruit or vegetable.

However, local fruits and vegetables that are normally highly nutritious and flavorful can be of poor quality and suffer significant nutrient loss if handled poorly after being harvested. To prevent this from happening, remove field heat shortly after harvest, hold at proper temperature and moisture levels, and protect from direct sunlight when selling at local markets. To retain maximum nutritional value, produce should be frozen or canned within 24 hours of harvest.

Sun and Vitamin C

There is evidence that certain foods offer superior nutritional benefits at peak ripeness. The conversion of simple sugars in tomatoes, for example, to ascorbic acid (and the eventual accumulation of vitamin C) is influenced by the amount of light, temperature, and carbon dioxide the plant receives. Studies have demonstrated a reduction of sugars (necessary for vitamin C content) in tomatoes when they are shaded during growth. There seems to be an inverse relationship between temperature and this necessary accumulation of carbohydrate. Low temperature and high light intensity favor the accumulation of carbohydrates in vegetables, whereas high temperature and low light intensity decrease the carbohydrate content.¹ This would suggest that allowing vegetables to obtain maximum sun exposure to achieve ripeness will maximize vitamin C content.

While this is indeed true, the "more sun, more vitamin C" argument holds

up only for fruits (including tomatoes and some melons) that are routinely harvested before ripe and continue to ripen after harvest. Tomatoes are important examples because they alone make up nearly a quarter of total vegetable consumption among U.S. consumers.² Most fresh produce can be harvested only when it reaches peak ripeness and would therefore ordinarily receive maximum "sunning."

It is important not to exaggerate the claim that local produce is picked when ripe. With the exception of tomatoes, bananas, pears, and some other fruits, all produce must be picked when ripe. You can't pick a green bean, pea, apple, eggplant, head of broccoli, or bunch of greens earlier or later—you must pick it when it's ready and then make sure you have a system in place to keep it in excellent condition until it is eaten. Given the current infrastructure of our global food system, the major growers and distributors shipping around the country and the world have the resources (and subsidies) to keep produce cool, whereas many small, local growers may not have adequate coolers. So, be careful not to overemphasize the "vine ripened" argument, recognizing that the proportion of foods that can be picked when immature is actually small.

Variety in the Diet

Eating a varied diet has been the foundation of nutrition advice since the dietary guidelines were first developed in the late 1970s. In the Healthy Eating Index, the USDA Center for Nutrition Policy and Promotion reports that less than one-third of Americans achieve the recommended amount of variety

in their diets. According to USDA Agriculture Research Service (ARS) Continuing Survey of Food Intake by Individuals (CSFII) U.S. Food Consumption Data, only about 10 different vegetables—potatoes, tomatoes, head lettuce, onions, carrots, sweet corn, snap beans, broccoli, cucumber, and peas—account for nearly 85 percent of total vegetable intake among Americans. The percentages are similar for fruits—oranges (and orange juice), apples (including juice and applesauce), bananas, grapes, watermelon, grapefruit, cantaloupe, cranberries, and grapes account for nearly 70 percent of total fruit intake. Not only is it striking that so few different fruits and vegetables make up such a large proportion of total intake, but for any given vegetable the diversity in plant varieties is limited. This results in a narrow genetic diversity in our consumption of fruits and vegetables and hence less diversity in our agriculture systems. Narrowing diversity in our plant and animal production systems increases vulnerability to pests and diseases.³

Many fruit and vegetable varieties have been developed for characteristics that are useful for today's globalized food system. For example, tomatoes that have delayed ripening can be harvested mechanically while still green, transported long distances, and withstand the pressures of storage and transportation. In more localized food systems, where fruits and vegetables will be marketed and eaten near the farms that produce them, farmers are likely to choose varieties based on what would work best in local soils and in local climates and the diverse preferences of the market. Farmers may also want to increase diver-

sity in the farming system to enhance stability and resilience against potential pests and diseases to which a system with limited genetic diversity would be more vulnerable.

So, if I can't say for certain that local foods are always more nutritious, what can I say?

Plenty! Eating locally grown and processed (value-added) foods is one tangible step people can take to strengthen local community-based food systems. Community food systems promote more food-related enterprises in proximity to food production, marketing, and consumption. Such systems enhance agricultural diversity, strengthen local economies (including farm-based businesses), protect farmland, and increase the viability of farming as a livelihood. Local food systems mean less long-distance shipment of the produce we enjoy, which means decreased use of nonrenewable fossil fuels for food distribution, lower emission of resulting pollutants, and less wear on transcontinental highways.

Finally, when farmers have strong markets they are more likely to continue farming. By eating locally, developing relationships with farmers, and encouraging them through purchases to grow a wide variety of different fruits and vegetables, consumers help assure a more "nutritious" food system that produces a wide variety of crops for local markets.

¹E. Karms and R. S. Harris. 1988. *Nutritional Evaluation of Food Processing*, 3rd ed. New York: Van Nostrand Reinhold.

²USDA-ARS. 1998. *The 1994–96 Continuing Survey of Food Intakes by Individuals (CSFII), What We Eat in America*. Beltsville, Md.: Beltsville Human Nutrition Research Center, Food Surveys Research Group.

³H. Norberg-Hodge. 2002. "Global Monoculture. The Worldwide Destruction of Diversity." In *Fatal Harvest—The Tragedy of Industrial Agriculture*. Sausalito, Calif.: Foundation for Deep Ecology.



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