

Tomatoes

1. **Lycopene is an antioxidant that was only recently discovered. Why is it important to our diet? Can the body make its own lycopene?**

Primary/Secondary-level response:

Lycopene is a carotenoid, which is fat soluble and, in the human body, carotenoids are found in fatty tissues and transported by lipoproteins. They act as dietary precursors to Vitamin A and aid the immune system. Lycopene is a strong antioxidant, which can help prevent degenerative diseases such as heart disease. The human body cannot produce lycopene so you need to obtain it from your diet (through foods you eat).

Harvard Medical School found that eating tomato products more than twice a week was associated with a 21-34% reduced risk of prostate cancer. In 1995, Harvard School of Public Health further studied these findings and found that those men who ate more than 10 servings of tomato foods per week were 45% less at risk to prostate cancer; those with only four to seven servings were 20% less at risk. Tomatoes are therefore a very important part of our diet and if tests are conclusive, then this could be a serious step towards combating other cancers.

2. **List three nutrients found in tomatoes. Name some of the health benefits of these nutrients. Describe the impact of processing, if any, on each nutrient.**

Primary/Secondary-level response:

[Answers will vary]

- Lycopene – An antioxidant that may decrease the risk of certain cancers and heart disease. When processed, tomatoes contain higher amounts of lycopene than raw tomatoes due to greater concentration.
- Vitamin A – A fat-soluble vitamin that helps support vision health, promote the growth and health of cells and tissues within the body, and may help protect against infections by keeping the skin and certain body tissues healthy. When processed, the Vitamin A content in tomatoes slightly decreases
- Vitamin C – Also known as ascorbic acid, this water-soluble vitamin helps produce collagen, keep capillary walls and blood vessels strong, help the body absorb iron

from plant food sources, help keep gums healthy, and help keep the body's immune system healthy. Processing destroys some of the vitamin C content.

- Potassium – An essential mineral that helps regulate the body's fluids and mineral balance within the body's cells, helps maintain normal blood pressure, and helps with muscle contractions. The potassium content increases when tomatoes are processed.
- Thiamin (vitamin B₁) – A water-soluble vitamin that helps produce energy from carbohydrates in cells of the body. The thiamin content of tomatoes increases slightly when processed.

3. How do botanists define fruits? Vegetables? Explain why the tomato is sometimes called a vegetable instead of a fruit.

Primary/Secondary-level response:

A fruit is the ripened (swollen) ovary of a flower. The ovary ripens when the ovules inside have been fertilized. Seeds of flowering plants are always found inside fruits.

Botanists generally do not use the word vegetable to mean a plant or even a plant part. The term "vegetable" is more of a popular term than a botanical one. Vegetables do not contain seeds and include non-productive parts of plants including roots, stalks, leaves, stems, flowers/fruit/seeds. Given the botanical definition mentioned above, tomatoes are a fruit, although they are more commonly known as a vegetable.

In 1893, the Supreme Court of the United States declared the tomato to be a vegetable, although recognizing that botanically it is a fruit. This declaration was based on the existence of an 1883 tariff that charged 10 percent on imported vegetables, including tomatoes. A frustrated tomato importer decided to challenge the tariff, arguing that tomatoes were actually a fruit and thus should be excluded from the vegetable tariff. The Supreme Court agreed that tomatoes were botanically a fruit, but argued that they were commonly grown in gardens with vegetables and treated as vegetables in markets and in the kitchen.

4. Tomatoes are eaten by people throughout the world. Identify at least five different cultures and research how tomatoes are used in their traditional meals.

- Italy – tomato sauces
- Mexico – salsa
- Britain – soups/broths
- Middle East – various cooked dishes
- Indonesia – condiment

- 5. California grows what percentage of the nation's tomatoes for processing? List five processed tomato products available in most grocery stores.**

Primary/Secondary-level response:

- California grows about 95 percent of the nation's tomatoes for processing.
- Processed tomato products include: ketchup, canned tomatoes, salsa, tomato sauce, tomato soup, and tomato paste.

- 6. Using a California map, color in the top three fresh market tomato-producing counties. In what months does peak harvesting take place in these counties?**

Primary/Secondary-level response:

- The top three tomato-producing counties are Fresno, Merced, and San Joaquin.*
- Peak harvesting takes place in the Central Valley from June through October.

*NOTE: Answers above reflect the most recent data from 2004, courtesy of the California Department of Food and Agriculture.

- 7. How are processing tomatoes harvested differently than fresh market tomatoes? Why do processing tomatoes have thicker skins?**

Primary/Secondary-level response:

- Processing tomatoes are mechanically harvested when ripe as opposed to fresh tomatoes, which are hand-harvested (generally before they are fully ripe but sometimes vine-ripened).
- The processing tomatoes have thicker skins and a firmer consistency, enabling it to be mechanically picked when ripe without damaging the fruit.

Sources:

www.californiatomatoes.org

www.cdfa.ca.gov

www.cfaitc.org/commodity/pdf/processingtomato.pdf

www.nal.usda.gov/fnic/foodcomp/search/

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