

## Commodity Fact Sheet

# Spinach

Information compiled by Fresh Express

**How Produced** – Before the grower plants, he will till and prepare his soil. Spinach can be grown on a variety of soil types but the best crops come from sandy loam soil, which is usually found along rivers. The sandy ground makes harvesting easier after rainfall because of good drainage. Drainage quality also affects the irrigation cycle. Since spinach is not a deep-rooted crop, it relies on frequent irrigations to maintain the proper soil moisture levels for ideal growth.

Approximately 90 percent of U.S. spinach is grown in California and Arizona. Spinach grows best during cool periods of the year. In the Salinas Valley, plantings begin in mid-February, depending on weather, and continue until mid-October. Imperial Valley and Yuma Valley plantings take place during late fall and winter. The California crop is grown principally in the cool coastal valleys while the Arizona crop is produced during the cool winter season. The coastal valleys provide foggy mornings and evenings—ideal growing weather for spinach.

Growers generally plant 32 rows of seed on an 80-inch bed which will produce more than 3 million individual plants per acre. In Salinas, it takes anywhere from 21 to 47 days for the spinach to mature once it is planted. In the Imperial and Yuma Valleys, it takes 21 to 55 days. Harvest usually begins around 11 p.m. Harvesting in the cool of the evening helps maintain produce freshness. Nearly all spinach is harvested mechanically.

**History** – Spinach has been grown and consumed for thousands of years. The earliest known origins as a food crop are from southwest Asia. The cool breezes coming from the sea undoubtedly kept the temperatures from climbing to levels harmful to spinach. The Egyptians later discovered ways of keeping the crop cool using irrigation; otherwise, the hot Egyptian climate would not allow it to mature before going to seed.

By the 13<sup>th</sup> century, spinach was popular in Spain and ranked highly as a desirable leafy green for good health. Traders carried spinach seed across Europe. Frequently used as an ingredient in soup, spinach soon made its way onto many tables because it grows easily and quickly, making it a prized choice for many home gardeners. With the advent of canning and freezing, spinach became much more popular throughout the world and is now available in many countries that did

not have a suitable climate to produce it. As people learned of its many nutritional advantages, spinach increased in popularity worldwide.



**Varieties** – Types of spinach are classified as smooth leaf, savoy and red veined. California grows all three. Smooth leaf varieties have a mature leaf length of about six inches. Savoy spinach is very crinkly and has the same sized leaf as the smooth leaf variety. Red veined spinach has a smaller leaf, similar to the all-green baby leaf types, but adding attractive color and nutrients associated with the red color in the leaf veins. There are many varieties in each type of spinach. Varieties widely used are Avenger, Lazio, Emilia and Marabu.

**Commodity Value** – Both raw and processed spinach were among the California crops showing increased values of production in 2007—more than 170 farms produced 647 million pounds of spinach. As the top spinach producing state, California accounts for 83 percent of the nation's total fresh market production. Spinach ranks 31<sup>st</sup> among all California commodities.

**Top Producing Counties** – In the U.S., spinach is mostly grown in three geographical areas: Salinas Valley and Imperial Valley in California, and Yuma Valley in Arizona. In 2007, California's Monterey County produced nearly 63 percent of the state's total production. Other top producing California counties include Imperial, San Benito, Ventura and Riverside.

**Nutritional Value** – Spinach is a good source of vitamin C and is high in vitamin A—antioxidants that help fight free radicals. Spinach is also a good source of potassium and vitamin K, and an excellent source of folate. In addition to containing these vitamins and minerals, spinach is a source of lutein and zeaxanthin—phytonutrients that have associated with eye health.

### For additional information:

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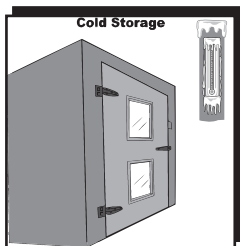


# Spinach Activity Sheet



#1

Food safety specialists carefully examine field conditions, monitoring crop quality and food safety compliance prior to planting, and during production and harvest.



#2

Cold temperatures are critical to freshness. Growers cool down spinach within hours of harvesting and keep it chilled from the field to the store.

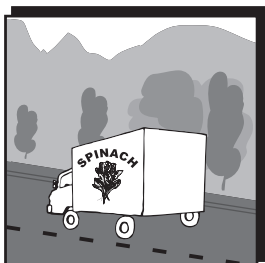


#3

From the field, spinach is transported to packaging facilities where it is thoroughly washed, rinsed and gently dried. Often spinach is packaged in a breathable bag for long-lasting freshness.

#4

After packaging, spinach is transported swiftly and safely to retail locations across the country. Maintaining consistent cold temperatures is important so every refrigerated truck is monitored throughout its journey to ensure spinach stays cool, fresh and delicious.



#5

Consumers enjoy eating spinach. Everyone knows that fresh spinach makes a delicious side dish, but it also makes a nutritious meal on its own.



## Lesson Ideas

- Traceability systems inform consumers about where their food comes from and plays a significant role in minimizing food safety risks. Visit [www.freshexpress.com/yoursaladstory](http://www.freshexpress.com/yoursaladstory) to track the origins of fresh, packaged spinach.
- Locate on a Western U.S. map where spinach is predominantly grown. What are the climatic differences or similarities?
- Use the section "Commodity Value" to calculate the amount of spinach grown (in pounds) by each California farm.
- Illustrate the process of photosynthesis and explain the role chlorophyll plays in spinach growth.
- Compare and contrast the nutritional value of spinach to other leafy greens such as mizuna, iceberg lettuce and arugula.
- Create a delicious recipe using spinach and provide a cooking demonstration for the class. Explain safe food preparation and give everyone in the audience a sample.
- Use age, gender, and activity level to determine how many fruits and vegetables you should consume daily. Design a week-long menu plan which includes eating spinach at least once a day.

## Fantastic Facts

1. Name the types of spinach varieties and describe their physical attributes.
2. How long does it take for a spinach plant to mature?
3. What time of the day is best for harvesting?
4. Spinach is a significant source of which nutrients?
5. The best spinach crops come from which type of soil? Why?
6. Which valleys in California and Arizona produce the most spinach?
7. What percent of the nation's total fresh spinach market production is grown in California?
8. Where are the earliest origins of spinach as a food crop?

1) Smooth Leaf (smooth, six inches in length), Savoy (crinkly leaves) and Red Veined (small leaves with red color) 2) 21-55 days 3) Late evening, such as 11:00 p.m. to maintain freshness 4) Vitamin A, vitamin C, potassium, folate, vitamin K, leutin and zeaxanthin 5) Sandy loam, good drainage and easy harvesting 6) Salinas Valley, Imperial Valley and Yuma Valley 7) 83% 8) Southwest Asia

## Lesson Plan: Steamed or Raw?

**Introduction:** Spinach is packed with nutrients, easy to prepare and tasty too! In fact, spinach can be prepared many different ways. In this activity, students will examine the visual appearance, taste, texture and smell of spinach prepared two different ways—steamed and fresh. This activity will encourage students to add spinach to their diets.

**Materials:** Raw and steamed spinach (prepared before or during class), paper plates, forks, napkins, observation journals, pencils.

### Procedures:

1. After students wash their hands, instruct them to use all their senses to observe the raw spinach. Keep in mind color, texture, smell, sound and taste. Students may record observations in their journals.
2. Repeat the observation activity above with steamed spinach.

3. Research and compare the nutritional value of raw and steamed spinach. Discuss why the nutritional values differ and investigate the chemical processes involved in cooking spinach.
4. Determine the differences in serving size for raw and steamed spinach.  
one cup raw = \_\_\_ cup steamed
5. Ask students to explain which type of spinach they liked best and why. Discuss the balance between choosing the most nutritious product and personal taste preference.
6. Optional: Give students the opportunity to compare the qualities and nutritional value of canned and frozen spinach too.

