Commodity Fact Sheet

Spinach

Information compiled by Fresh Express

How Produced – Before the grower plants, the farmer will till and prepare the 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. Almost 50 percent of spinach produced in California is grown in the Salinas Valley in Monterey County, where spinach is produced from February through November. Spinach is a quick-growing, cool-season vegetable that grows best at temperatures from 45 ºF to 75 ºF. The foggy and cool summers of the California central coast and the clear and cool winters of the Arizona desert provide ideal growing conditions for spinach.

Spinach is planted relatively shallow at about ½ to ¾ inch depth and at high seed densities of 21 to 48 seed lines per 80-inch beds. These high seed densities result in about 3.5 million plants per acre. Spinach can be harvested in the Salinas Valley 21 to 50 days after planting. Spinach is grown for fresh market (bunched or packaged) and for the processing (frozen) industry. Most of the spinach is mechanically harvested using a machine with a front cutter bar. After harvesting, spinach is typically cooled to 34 ºF at centralized cooling facilities before being transported to the processing plant. Spinach has a very high respiration rate and is therefore quite perishable. If kept at low temperatures, spinach can be stored for 14 to 18 days.

History – Spinach has been consumed for thousands of years. It is believed that spinach made its way into Indian and Asian cooking through Arab traders who carried it to Asia from the Middle East. In the 11th and 12th centuries, spinach became a popular vegetable in Spain, and from there it diffused to Germany, Italy, England, and France. It has been used in salads, soups, in baked dishes with cheese, yogurt, and in tortellini. In the early 19th century, American colonists introduced spinach to North America. At least three varieties were grown by 1806. With the development of canning and freezing, the popularity of spinach increased world-wide. The increase in spinach consumption in the U.S. has been due to the sale of freshly packaged teen and baby spinach.

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. Popular varieties in California include Avenger, Bolero, Bossanova, Dolphin, Emilia, Falcon, Lazio, Palco, Unipak, and Whale. Varieties are constantly being developed and may replace these currently popular ones.

Commodity Value – The acreage of fresh market spinach in California has continuously increased by 30% over the last decade from 15,000 acres in 2001 to 19,600 acres in 2011, while the acreage of processing spinach remained constant at 7,300 acres. In 2011, the total crop volume for spinach (fresh market and processed) was 606 million pounds, showing an increase of 59% from 2001. California accounts for 58% of the nation's total spinach production. Spinach ranks number 41 among all commodities grown in California.

Top Producing Counties – The top counties for spinach production in California are Monterey (66%), San Benito (9%), Imperial (8%), Ventura (6%), and Santa Barbara (4%).

Nutritional Value – Fresh spinach is a good source of antioxidant vitamins like A and C and phenolic antioxidants like lutein, zeaxanthin, and beta-carotene. These compounds are scavengers against free radicals and play a healing role in aging and different diseases, including cancer, and promote normal eye-sight. Spinach is an excellent source of vitamin K, which is important for strengthening the bone mass. It also contains vitamin B6 and folates.

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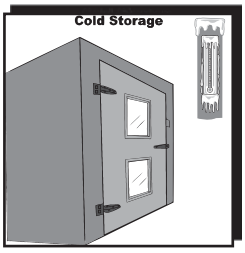
Spinach Activity Sheet

#1

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



#2

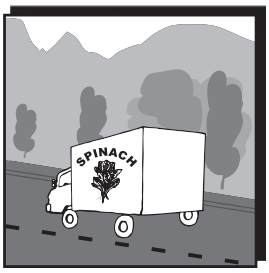
Cold temperatures are critical to freshness. Growers cool down spinach within hours of harvesting and keep it chilled from the field to the store.

#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* 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?
- Based on the total pounds of spinach produced in California in 2011, how many pounds would have been grown in Monterey County? How many tons is this?
- 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. After harvest, spinach is typically cooled to what temperate?
4. Spinach is a significant source of which nutrients?
5. The best spinach crops come from which type of soil? Why?
6. Which valley in California produces the most spinach?
7. What percent of the nation's total spinach 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) 21-50 days 3) 34 ºF 4) Vitamin A, vitamin C, vitamin B6, vitamin K, folate, beta-caroten, lutein, and zeaxanthin 5) Sandy loam, good drainage and easy harvesting 6) Salinas Valley 7) 58% 8) The Middle East

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.

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