



# RESEARCH SUMMARY: FROZEN VEGETABLES ARE AS NUTRITIOUS AS FRESH



## Feel good about frozen

Most Americans would need to triple their daily vegetable servings to meet federal recommendations, so offering them ideas on consuming more vegetables in any form may be helpful. Extensive research comparing nutritional value of fresh and frozen vegetables shows that exclusively focusing on fresh vegetables may exclude the nutritional benefit of frozen vegetables, as well as overlook the potential nutrient losses of stored fresh vegetables. You can feel good about recommending frozen vegetables when offering tips to increase vegetable consumption overall. Key findings include:

- Frozen vegetables, such as green beans, sweet corn and peas, contain similar levels of vitamin C, fiber, magnesium, and potassium as fresh vegetables.<sup>1</sup>
- Freshly picked vegetables remain the nutrient leaders, however with prolonged storage, substantial nutrient degradation occurs in fresh vegetables, even with refrigeration. For example, vitamin C losses for some fresh vegetables when stored in the refrigerator for several days were greater than that of vegetables stored in the freezer.<sup>2</sup>

## “Frozen as nutritious as fresh”

Freezing vegetables “locks in” important vitamins and stops the nutrient loss that can occur in fresh vegetables over time.

## Additional study findings:

- A three-year study on beans, sweet corn, and peas confirmed that frozen vegetables offer similar amounts of key nutrients as fresh vegetables.<sup>1</sup>
- Frozen green beans, carrots, and spinach, maintained their nutritional quality after freezing. For all vegetables studied, the vitamin C level in quick-frozen vegetables was found to be comparable to fresh vegetables.<sup>2</sup>
- Researchers at the University of Illinois, Champaign- Urbana compared the nutrients in fresh, frozen, and canned vegetables over two consecutive crop years. Results showed that the freezing process locks in nutrients throughout frozen storage.<sup>3</sup>
- Concentrations of total carotenoids, including  $\beta$ -carotene, lutein and zeaxanthin, were the same in fresh and frozen golden whole kernel corn.<sup>4</sup>

1 Makhlof J et al. Some nutritional characteristics of beans, sweet corn, and peas (raw, canned, and frozen) produced in the province of Quebec. *Food Research International*, 1995; 28:253-259.

2 Favell DJ. A comparison of the vitamin C content of fresh and frozen vegetables. *Food Chemistry*, 1998; 62:59-64.

3 Howard L et al.  $\beta$ -Carotene and ascorbic acid retention in fresh and processed vegetables. *Journal of Food Science*, 1999; 64(5):929-936.

4 Scott C.E., Eldridge A.L. Comparison of carotenoid content in fresh, frozen and canned corn. *Journal of Food Composition and Analysis*. 2005;18, 551-559.

