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Vegetables and Pulses Outlook: Special Article

Dietary Assessment of U.S. Vegetable and Dry Pulse Crops Sector--Updated[1]

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Approved by the World Agricultural Outlook Board.

The United States is among the world's top five producers of vegetables (FAOSTAT, 2015). The vegetable and pulse sector (excluding melons), encompassing a wide array of crops and products and hundreds of independent markets within the food marketing system, accounted for $17.3 billion in 2010-14 in terms of value of production and about 6.4 million acres harvested in terms of land use. When compared with food grains, the value of this sector exceeded the combined value of rice, rye, and wheat (about $16.7 billion) despite vegetables and pulses being harvested on about a tenth of the combined harvested area of these food commodities in the United States. But beyond its monetary value and importance to the farm economy, the benefits from increasing consumption of vegetables and pulses could improve the quality of U.S. consumer diets while stimulating production for the industry.

Increasing the average U.S. consumer's intake of vegetables and pulses has been a mainstay of the *Dietary Guidelines for Americans*, which is published jointly by the U.S. Department of Agriculture and the U.S. Department of Health and Human Services. Since 1980, the guidelines have provided dietary recommendations based on the most current scientific evidence for Americans over 2 years old. The core dietary messages have remained consistent, even as subsequent editions change slightly to reflect the latest scientific and medical information on nutrition and health. The 2015-2020 *Dietary Guidelines* stress the importance of increasing the amount of vegetables, fruit, whole grains, low-fat dairy, and seafood in order to close nutrient gaps and move toward healthier eating patterns. U.S. consumers, on average, for various reasons, have not met the recommended amount for vegetables (Stewart et al., 2016; Buzby et al., 2014).

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Trends in Per-Capita Use

The volume of vegetables and dry pulses in the U.S. food supply declined 8 percent, from an average of 420 pounds per person in 2000-04 to 387 pounds per person in 2010-14. The per-capita use data (also called disappearance or availability) is based on the measurement of commodity supplies moving through production and trade channels for domestic use. The data does not directly measure what individuals eat, but rather serves as an indicator of consumption trends over time.

Many factors influence what people eat, including changes in food prices and income levels; availability of food through domestic production and trade; tastes and preferences; product convenience; exposure to new cuisines; and evolving dietary guidelines. Much of the decline in per-capita vegetable and pulse use during the 2000-04 to 2010-14 period has been driven by declining use of potatoes, followed by head lettuce, sweet corn, and carrots, among others. Per-capita use of potatoes during this period decreased 17 percent from 136.2 to 112.8 pounds, even though domestic production has been on the rise. A number of factors likely contributed to the decline in potato use; for instance, the growth in demand of export markets. Potato exports rose from just under 10 percent of production in 2000-04 to an average of 15 percent in 2010-14. Per-capita use of head lettuce declined during this period from 22.5 pounds per person to the 15.2 pounds as consumers switched to dark-green and leafy products like romaine and leaf lettuce, collard greens, kale, and mustard greens.

Table 1— Per-capita use and consumption of vegetables and dry pulses, 2000-04 and 2010-14

Item	Per-capita use[1]		Change, 2000-04 to 2010-14	2010-14 Loss-adjusted food availability[2]
	2000-04	2010-14		
	Pounds, fresh-weight equivalent		*Percent*	*Cups/day*
Commerical vegetables by market category:				
Fresh market	200.2	186.9	-7	0.8
Processing market	219.3	200.6	-9	0.8
Canning	100.7	93.7	-7	0.2
Freezing	78.7	68.9	-12	0.2
Others (dehydrated and chips)	32.9	30.8	-6	0.2
Dry pulses (i.e. legumes)	7.1	7.2	2	0.2
Vegetables by *Guidelines'* subgroups[3]:				
Dark-green vegetables[4]	22.7	25.3	12	0.2
Escarole, romaine, and leaf lettuces	10.1	11.8	17	0.1
Broccoli	7.8	8.8	13	0.0
Red and orange vegetables[4]	109.4	109.6	0	0.2
Tomatoes	88.6	87.9	-1	0.2
Carrots	12.2	10.1	-17	0.0
Starchy vegetables[4]	166.4	138.7	-17	0.6
Potatoes	136.2	112.8	-17	0.6
Sweet corn	26.6	23.1	-13	0.0
Other vegetables[4]	114.0	106.6	-7	0.5
Onions	21.0	20.3	-4	0.1
Head lettuce	22.5	15.2	-32	0.1
Dry pulses (i.e. legumes)	7.1	7.2	2	0.2
Total vegetables and pulses	419.6	387.4	-8	1.7

[1]Aggregate data, unadjusted for cooking losses, plate waste, and other losses. [2]Adjusted for cooking losses, plate waste, and other losses. According to the 2015-2020 *Dietary Guidelines* , 1 cup of raw or cooked vegetables; 1 cup vegetable juice; 2 cups of leafy salad greens; or 1/2 cup dried vegetables can be considered 1 cup from the vegetable group. [3]Includes fresh and processed vegetables. [4]Includes food item(s) not shown separately.

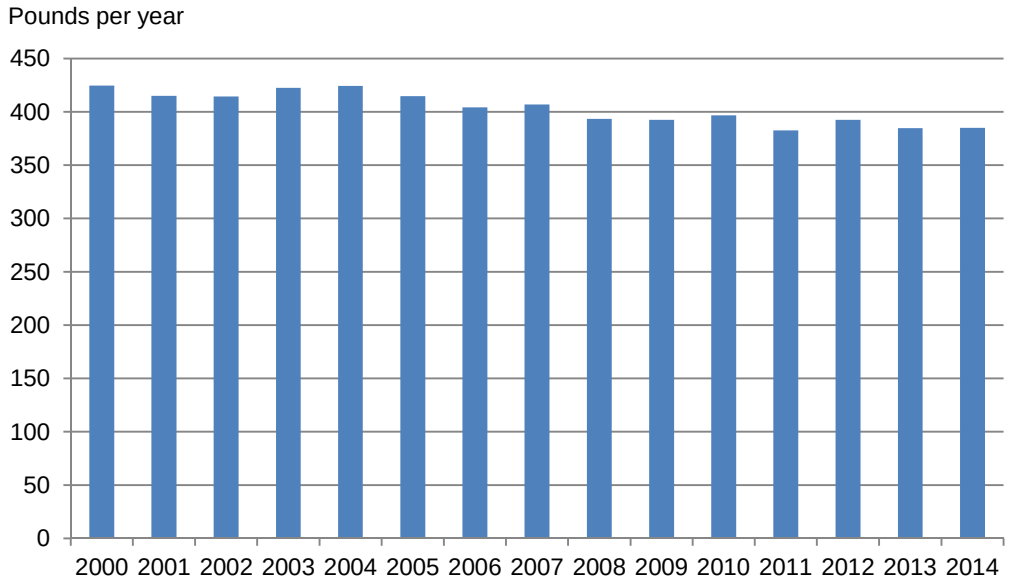
Source: USDA, Economic Research Service.

In terms of share, the majority of per-capita vegetable availability in 2010-14 came from potatoes, tomatoes, sweet corn, onions, and head lettuce (29, 23, 6, 5, and 4 percent, respectively). Within this market segment, the bulk of frozen vegetables came from frozen potatoes. For example, the frozen potato share was 70 percent in 2010-14, down from 73 percent in 2000-04.

Other notable trends include the following:

- Between 2000-04 and 2010-14, fresh-market vegetables in the U.S. food supply declined 7 percent, though not all items within this market segment declined.
- Sweet potatoes, bell peppers, romaine and leaf lettuce, and tomatoes all contributed to the growth in availability of fresh vegetables from 2000-04 to 2010-2014.
- Dark-green and leafy products such as collard greens, kale, mustard greens, and romaine lettuce trended upward (12 percent). Meanwhile, the availability of potatoes, head lettuce, cabbage, and carrots, among others, dropped between 2000-04 and 2010-14.
- Within the processing market, frozen vegetable availability decreased 12 percent, from 78.7 pounds per person in 2000-04 to 68.9 pounds per person in 2010-14. Potatoes were the primary driver behind this decline in vegetables for freezing, followed by carrots and sweet corn. In contrast, the availability of frozen broccoli and miscellaneous vegetables (collards, kale, mustard greens, okra, blackeye peas, pumpkin, etc.) grew 0.2 and 0.9 pounds per person, respectively, during this period.
- Availability of potatoes for chips rose 5 percent, from 16.6 pounds per person in 2000-04 to 17.4 pounds per person in 2010-14.
- Dry pulses (i.e., legumes) increased 2 percent, from 7.1 pounds per person in 2000-04 to 7.2 pounds per person in 2010-14. Pinto beans' share of legumes accounted in 2010-14 for one-third, followed by black beans. Per-capita use of chickpeas (garbanzo) more than doubled during this period, driven primarily by growing demand for hummus.

Figure 1
Per capita availability of vegetables and pulses flat since mid-2000s



Includes potatoes, sweet potatoes, and mushrooms.
Source: USDA, Economic Research Service, 2016 *Vegetables and Pulses Yearbook*.

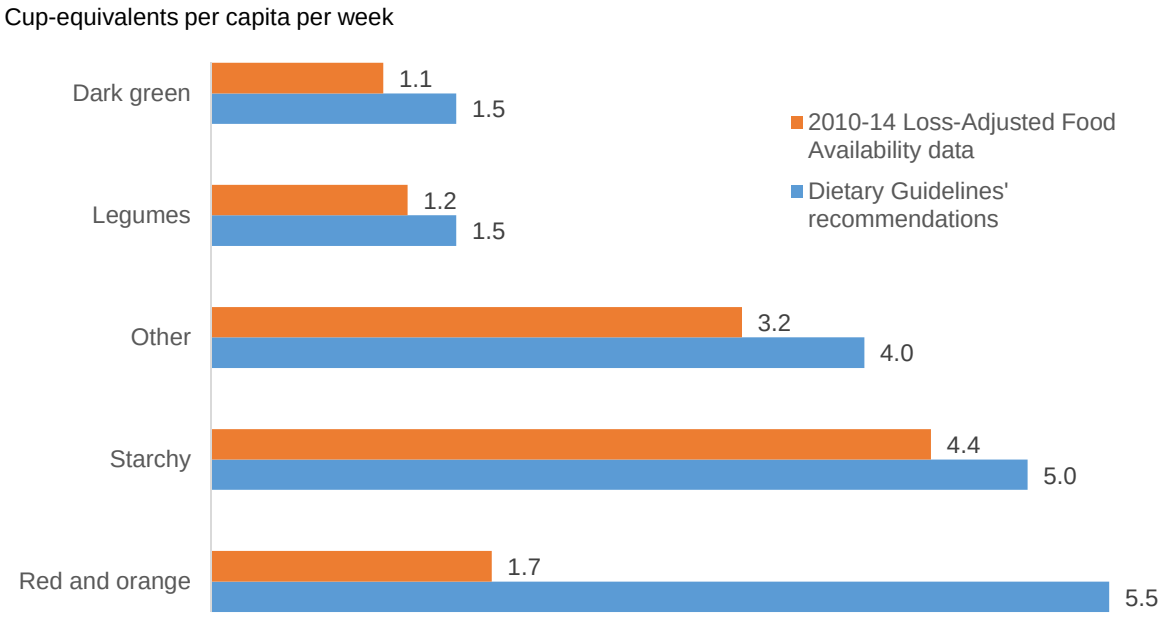
Dietary Assessment of Vegetables and Dry Pulses

Despite public campaigns and increased public awareness of the importance of increasing vegetable intake, Americans have not fully adopted the Federal *dietary guidelines* recommendations. According to the ERS Loss-Adjusted Food Availability data, the average American consumed about 1.7 cups per day in 2010-14—unchanged since 2005 and well below the 2015-2020 *Dietary Guidelines for Americans* daily recommendations of 2.5 cups (based on the 2,000-calorie-per-day reference level). The Loss-Adjusted Food Availability data adjusts the per-capita use data for losses from farm-to-fork and then converts volume in pounds-per-year to cup-equivalents per day.[2] The data does not measure food intake but rather serves a closer approximation of what people consume.

In addition to the overall recommendations for vegetables, the *Guidelines* also encourage choosing a variety of vegetables, since some are higher in certain vitamins and minerals than others. As such, current recommendations are that consumers select from five vegetable subgroups several times per week in order to optimize nutrient intake. On a weekly basis, the *Guidelines* recommend a diet consisting of dark-green (1.5 cups), red and orange vegetables (5.5 cups), legumes (1.5 cups), starchy vegetables (5 cups), and other vegetables (4 cups). Americans, on average, have not met the recommended amount for any for the five subgroups. For other and starchy vegetables, 3.2 cups and 4.4 cups were consumed per week respectively. Consumption of red and orange vegetables (2.1 cups), dark-green vegetables (1.1), and legumes (1.2) were furthest from the recommended guideline levels.

For Americans to meet the *Guidelines'* recommendations, their intake for overall vegetable (including legumes) would need to increase by 50 percent (0.84 cup per person per day). In terms of variety, Americans would need to substantially increase their consumption of red and orange vegetables by 220 percent, followed by dark greens by 43 percent, legumes by 25 percent, starchy vegetables by 13 percent, and other vegetables by 23 percent.

Figure 2
2010-14 Loss-Adjusted Food Availability data compared with 2015-2020 *Dietary Guidelines* recommendations for a 2,000-calorie diet



Note: Other vegetables for example include artichokes, asparagus, snap beans, etc. The dietary recommendations is based on based on the 2,000-calorie-per-day reference level.

[2] The Loss-Adjusted Food Availability data series, as noted on ERS website, is considered preliminary data.

This special article is drawn from...

U.S. Department of Agriculture, Economic Research Service. *Vegetable and Pulses Yearbook*, March 2016.

U.S. Department of Agriculture, Economic Research Service. Loss-Adjusted Food Availability Data.

U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans*, 2015-2020, eighth edition.

Citations

Buzby, J.C., H.F. Wells, and J. Hyman. 2014. The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States, EIB-121, Economic Research Service, U.S. Department of Agriculture, February 2014.

Stewart, H., J. Hyman, A. Carlson, and E. Frazão. 2016. The Cost of Satisfying Fruit and Vegetable Recommendations in the Dietary Guidelines, EB-27, Economic Research Service, U.S. Department of Agriculture, February 2016.

Food and Agriculture Organization of the United Nations. FAOSTAT Statistics Database.