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Vegetables and Pulses Outlook

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Increased per capita availability driven by growing vegetable imports and record domestic pulse production

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Approved by the World Agricultural Outlook Board.

U.S. production of commercial vegetables and dry pulses (including mushrooms, potatoes, and sweet potatoes) totaled 129 billion pounds in 2016, down less than 1 percent from the previous year. During the same period, imports increased 10 percent and exports increased 5 percent, while stocks carried over from the previous crop remained steady.

The gains from imports translated to only modestly higher domestic availability in 2016. On a per capita basis, the total volume of vegetables and pulses averaged 383 pounds in 2016—up 2 percent from last year. Canning vegetables, particularly tomato products, accounted for a majority of the increase in domestic vegetable availability in 2016. Although total availability is up from the previous year, levels are down 10 percent from a peak in 2000, a decline that has been driven mainly driven by potatoes, followed by tomatoes and head lettuce.

The U.S. vegetable trade deficit widened in 2016 as a strong dollar and weak global demand continued to stagnate U.S. exports. In 2016, about 23 percent of all domestic vegetable and pulse availability was imported, while 18 percent was exported to foreign destinations. Import share of domestic use of vegetables has nearly tripled in the last two decades, from 9 percent in 1996 to 23 percent in 2016.

Lentil and chickpea planted area in 2017 is expected to continue an expansion trend, with NASS reporting record-high projections of 1.055 million and 498,000 acres, respectively. As forecast, these gains combine with a projected 2 percent expansion in dry bean area less garbanzo seedings, to help pulse crop plantings reach a new record-high of 4.06 million acres. In 2017, only dry pea planted area is expected to contract, down 17 percent, largely on declines in Montana and North Dakota.

Industry Overview

Table 1—U.S. Vegetable and Pulse Industry at a Glance, 2014-2016[1]

Item	Unit	2014	2015	2016p	Percent Change 2015-2016
Area harvested					
Vegetables Fresh	1,000 acres	1,402	1,393	1,392	-0.1
Vegetables Processing	1,000 acres	1,098	1,076	1,007	-6.4
Potatoes	1,000 acres	1,051	1,054	1,008	-4.4
Dry beans, peas and lentils	1,000 acres	2,824	3,291	3,833	16.5
Other[2]	1,000 acres	138	156	167	6.5
Total	**1,000 acres**	**6,513**	**6,970**	**7,406**	**6.3**
Production					
Vegetables Fresh	Million cwt	369	358	365	2.0
Vegetables Processing	Million cwt	400	402	374	-7.2
Potatoes	Million cwt	442	440	440	0.0
Dry beans, peas and lentils	Million cwt	50	54	69	29.0
Other[2]	Million cwt	39	40	41	1.5
Total	**Million cwt**	**1,300**	**1,295**	**1,289**	**-0.4**
Crop value					
Vegetables Fresh	$ millions	9,978	11,699	10,247	-12.4
Vegetables Processing	$ millions	2,357	2,234	1,852	-17.1
Potatoes	$ millions	3,926	3,859	3,919	1.6
Dry beans, peas and lentils	$ millions	1,224	1,218	1,520	24.8
Other[2]	$ millions	1,761	1,813	1,842	1.6
Total	**$ millions**	**19,247**	**20,823**	**19,381**	**-6.9**
Unit value[3]					
Vegetables Fresh	$/cwt	27.04	32.70	28.07	-14.2
Vegetables Processing	$/cwt	5.89	5.55	4.96	-10.7
Potatoes	$/cwt	8.88	8.76	8.90	1.6
Dry beans, peas and lentils	$/cwt	24.60	22.72	21.99	-3.2
Other[2]	$/cwt	45.65	44.94	44.95	0.0
Total	**$/cwt**	**14.81**	**16.08**	**15.03**	**-6.5**
Imports					
Vegetables Fresh	$ millions	6,377	6,618	7,461	12.7
Vegetables Processing	$ millions	2,845	3,067	3,244	5.8
Potatoes	$ millions	1,176	1,150	1,243	8.0
Dry beans, peas and lentils	$ millions	233	225	215	-4.3
Other[2]	$ millions	819	746	858	15.0
Total	**$ millions**	**11,449**	**11,805**	**13,020**	**10.3**
Exports					
Vegetables Fresh	$ millions	2,183	2,087	2,107	1.0
Vegetables Processing	$ millions	1,807	1,811	1,794	-0.9
Potatoes	$ millions	1,701	1,672	1,737	3.9
Dry beans, peas and lentils	$ millions	786	700	845	20.7
Other[2]	$ millions	522	529	631	19.1
Total	**$ millions**	**6,998**	**6,800**	**7,114**	**4.6**
Per-capita availability					
Vegetables Fresh	Pounds	141.5	141.2	144.5	2.4
Vegetables Processing	Pounds	111.8	101.2	106.5	5.2
Potatoes	Pounds	112.8	115.4	111.2	-3.6
Dry beans, peas and lentils	Pounds	6.4	7.7	9.7	25.8
Other[2]	Pounds	11.3	11.5	11.3	-2.3
Total	**Pounds**	**383.8**	**377.0**	**383.2**	**1.6**

p = preliminary. [1]Total rounded. [2]Includes sweet potatoes and mushrooms. [3]Ratio of total value to total production. [4]Includes canned, frozen, and dried. Excludes potatoes, pulses, and mushrooms. [5]Other includes mushrooms and vegetable seed. All trade data are on a calendar-year basis. Note: Hundredweight (cwt), a unit of measure equal to 100 pounds. Sources: USDA, Economic Research Service, using data from USDA, National Agricultural Statistics Service, Crop Production, Acreage, Agricultural Prices, Crop Values, Mushrooms, and Potatoes; and from U.S. trade data from U.S. Department of Commerce, U.S. Census Bureau

U.S. Vegetable Production

Down slightly from a year earlier, in 2016 the United States produced about 129 billion pounds of all commercial vegetables and pulses (including mushrooms and potatoes), with a value of $19 billion and harvested area of about 7.4 million acres. The three leading crops, including fresh and processed, were potatoes (44 billion pounds), tomatoes (29 billion pounds), and lettuce (9 billion pounds), which combined accounted for approximately two-thirds of total production volume. During this period, production value fell 7 percent from a year earlier due to decreasing domestic prices for most fresh-market and processing crops.

Fresh-Market Vegetables

Excluding potatoes, sweet potatoes, and mushrooms, the United States produced 34.9 billion pounds of fresh vegetables in 2016, down 1 percent from a year earlier as area harvested declined. This continues a gradual decline of 14 percent from the most recent peak in 2004. California continued to lead the country in fresh-market production, accounting for 50 percent of annual fresh-market vegetable output in the United States, despite continued drought conditions for 2016.

Table 2—Annual U.S. production of selected fresh-market vegetables

Commodity	2014	2015	2016p	Change 2015-16
	Million pounds			*Percent*
Artichokes[1]	94.9	91.8	98.6	7
Asparagus	56.8	47.4	54.6	15
Beans, snap	372.0	395.2	416.8	5
Broccoli	1,991.0	2,110.4	2,193.8	4
Cabbage[2]	2,114.1	2,017.8	1,844.9	-9
Carrots	2,537.9	2,574.0	2,220.7	-14
Cauliflower	628.6	651.1	661.6	2
Celery[1]	1,839.3	1,711.0	1,706.2	0
Corn, sweet	2,464.9	2,795.2	2,359.3	-16
Cucumbers	689.5	672.5	698.2	4
Garlic[1]	386.8	408.9	369.0	-10
Lettuce				
Head	4,591.8	4,310.8	4,760.1	10
Leaf	1,298.4	1,423.3	1,326.4	-7
Romaine	2,467.9	2,633.5	2,894.6	10
Onions[1]	6,981.5	6,718.4	6,670.9	-1
Peppers, bell[1]	1,553.6	1,515.5	1,561.5	3
Peppers, chile[1]	462.5	403.4	469.4	16
Pumpkins[2]	1,301.9	753.8	1030.5	37
Spinach	591.9	607.6	556.6	-8
Squash[1]	601.7	601.6	613.1	2
Tomatoes	2,728.0	2,637.5	2,366.8	-10
Selected total	35,755.0	35,080.7	34,873.6	-1

p = preliminary. [1]All uses. [2]Beginning in 2016, NASS reports fresh and processed separately.
Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Arizona regained its position as the second largest source of fresh-market vegetables, with 9 percent of output. Florida, ranked third in terms of fresh production volume. Both Arizona and Florida saw increases in 2016 production volume. The four largest crops, in terms of volume, were onions, head lettuce, tomatoes, and romaine lettuce, which combined accounted for 48 percent of the total production. More favorable growing conditions, especially in California, may indicate that 2017 production is likely to increase from current levels.

Head lettuce, tomatoes, and romaine lettuce claimed the highest values, generating $1.3 billion, $0.9 billion, and $0.9 billion of farm value, respectively. California growers accounted for 55 percent (or $6.1 billion) of fresh-market vegetable farm value, followed by Arizona with 12 percent. Overall fresh-market farm value decreased 12 percent to $10 billion in 2016 due to lower prices for numerous vegetables.

Processing-Market Vegetables

Production of vegetables for the processing market (excluding potatoes and mushrooms) totaled 35.9 billion pounds in 2016—down 8 percent from 2015. Although the majority of individual processing crops reported increases, drops in production volume of lima beans, green peas, tomatoes, broccoli, and cauliflower more than offset the increased production in other crops. However, with increased imports, the loss in production did not translate to lower domestic use for 2016.

Table 3—Annual U.S. production of selected processing vegetables

Item	2014	2015	2016p	Change 2015-16
	---------- *Million pounds* ----------			*Percent*
Beans, lima	100.8	100.5	90.4	-10
Beans, snap	1,362.5	1,529.8	1,583.8	4
Carrots	643.6	588.0	809.9	38
Corn, sweet	5,135.6	4,976.2	5,033.3	1
Cucumbers	1,073.8	1,066.9	1,070.6	0
Peas, green[1]	725.7	822.6	687.7	-16
Spinach	180.6	150.4	156.9	4
Tomatoes	29,274.6	29,508.7	26,379.6	-11
Dual uses:				
Asparagus	17.5	15.5	15.9	2
Broccoli	69.0	78.4	52.8	-33
Cauliflower	7.5	4.8	4.4	-8
Selected total	38,591.3	38,841.9	35,885.2	-8

p = preliminary. [1]All uses.
Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

In light of 2016 water restrictions in California, where about 96 percent of tomatoes for the processing market are grown, and high stocks held over from 2015, output volume fell 11 percent to 26 billion pounds as harvested area declined. Processing tomatoes used for canned products such as sauces, paste, soup, juice, and ketchup, fell for the first time in 2 years, following record highs in both 2014 and 2015.

During the same period, the value of production for processing vegetables fell 17 percent to $1.9 billion in 2016, driven by lower prices and production for many commodities.

The top four crops in terms of processing-vegetable farm value were tomatoes ($1.1 billion), sweet corn ($231 million), cucumbers ($163 million), and snap beans ($158 million). The top three processing-vegetable States were California ($1.3 billion), Washington ($119 million), and Minnesota ($100 million). Wisconsin, which was ranked second in 2015, was not reported by NASS in 2016 for individual disclosure concerns.

Highlights from Other Markets

Sweet Potatoes

In 2016, the United States produced over 3.2 billion pounds of sweet potatoes, with a value of $700 million, from a harvested area of 163,300 acres. Production in 2016 was 2 percent larger than 2015 and represents a record high for the sector. The increased production was largely driven by increases in North Carolina and Mississippi, which accounted for 54 and 16 percent of the total domestic production, respectively. California, the second largest producer of U.S. sweet potatoes at 20 percent, experienced a 1-percent reduction in output.

Figure 1: U.S. sweet potato production and price, 2000-2016

Source: USDA, Economic Research Service

Area harvested rose 7 percent to 163,300 acres--another record for the sector, driven by increased harvested acres across all reporting States. The increase in acres harvested, however, was tempered by reduced yields. U.S. yield fell 5 percent to 193 cwt per acre; driven by falling yields in most major producing States. The sole exception was Mississippi, whose estimated yield rose 21 percent to 170 cwt per acre, following an abnormally low year for the State in 2015.

Despite expanded U.S. production, robust global demand put upward pressure on the 2016 sweet potato price. At $22.40 per cwt, the price was 3 percent above the previous year, but still 7 percent below the 2013 high of $24.10 per cwt.

Potatoes

Total potato production in 2016 remained unchanged from the previous year at 44 billion pounds. During this period, harvested area fell 5 percent from 2015 levels while average yield per acre rose substantially to 437 cwt per acre. Idaho (30 percent of production output), Washington (23 percent), and Wisconsin (6 percent) remained the top producing States. Production varied across potato products, as fresh table stock rose 3 percent, to 11 billion pounds, from the previous year, while potatoes for processing fell by the same percentage to 27 billion pounds.

Production value in 2016 rose slightly, due to a 2-percent increase in prices to $8.9 per cwt for the United States as a whole. The increase was driven by increases across a majority of potato-producing States, including Washington and Wisconsin.

With prospective plantings for spring potatoes on the rise, 2017 production is on track to exceed current levels.

U.S. Vegetable Trade

Global markets are important outlets for U.S. vegetable and pulse production. In calendar year 2016, the United States exported $7.1 billion in vegetable and pulse products and imported $13.0 billion. During the same period, over one-quarter of U.S. fresh-market vegetables available (including potatoes and mushrooms) were imported, while 21 percent of processed vegetables and 19 percent of the dry pulses were supplied by imports. In 2016, fresh-vegetable exports, as a share of supply, remained relatively steady at approximately 7 percent while the dry-pulse export share of supply contracted to 31 percent. When aggregated, the United States has had a negative net vegetable-and-pulse trade balance since 2001. Based on early trade data, 2017 seems poised to maintain or surpass 2016 trade levels for both imports and exports.

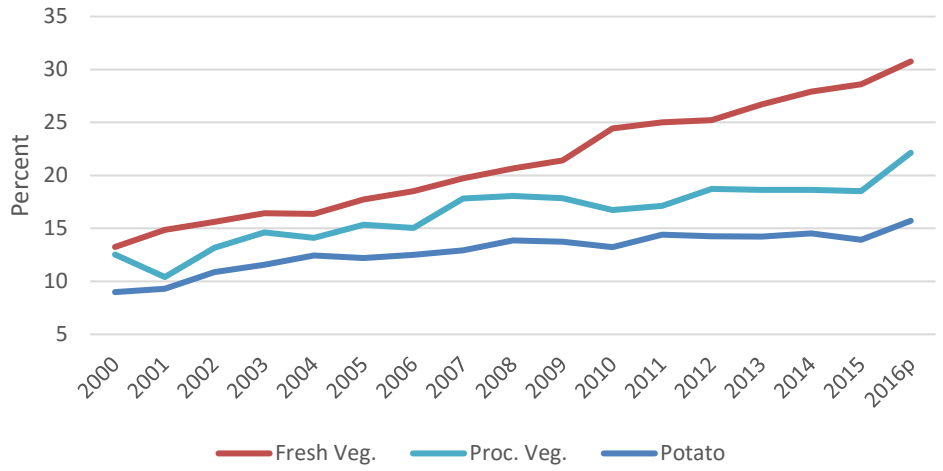
Fresh-Market Vegetables (including potatoes and mushrooms)

- The U.S. vegetable trade deficit widened in 2016 as the value of fresh vegetable imports expanded more than the export value. Imports of fresh-market vegetables increased 13 percent from 2015 to $7.5 billion in 2016. Mexico accounted for 74 percent of import value in 2016, followed by Canada (13 percent), Peru (4 percent), and China (1 percent).
- The value of fresh-market vegetable exports increased 1 percent to $2.1 billion in 2016, largely due to expanding market shares in Japan and emerging markets. The value of exports to Japan rose by 35 percent from 2015 values, and Japan accounted for 5 percent of U.S. fresh-vegetable export value.
- Exports to other top foreign destinations—Canada and Mexico—dropped 5 percent to $1.7 billion. Canada accounted for 76 percent of U.S. fresh-vegetable export value in 2016, and Mexico accounted for 3 percent.
- In 2016, about 26 percent of fresh vegetables utilized in the United States were imported, compared with 9 percent in the early 1990s.
- In terms of volume, in 2016 fresh-vegetable imports rose 10 percent to 14.8 billion pounds, while exports rose 6 percent to 4.2 billion pounds, likely due to increased global demand.
- Import volume from Mexico, Canada, and Peru all expanded in 2016, while volume from China declined.

Processing-Market Vegetables (including potatoes and mushrooms)

- The United States continues to be a net importer of canned, frozen, and dried vegetables (including mushrooms and potatoes) in terms of value. Import value, which totaled $4.5 billion in 2016, exceeded export value by $1.1 billion. The gain in import value continues to be driven by canned and frozen vegetables.
- In 2016, about 21 percent of processing vegetables utilized in the U.S were imported compared with 7 percent in the early 1990s.
- In terms of volume, in 2016 processing vegetable imports rose 7 percent to 12.6 billion pounds, while exports fell 1 percent to 17.1 billion pounds.

Figure 2: Percent of availability accounted for by trade, 2000-2016



[1]Excludes, sweet potatoes, mushrooms, and dehydrated products.
Source: USDA, Economic Research Service.

The percent of domestic availability accounted for by imports continues to climb. Record levels in 2016 were led by imports of fresh vegetables, which reached 31 percent. This represents an increase of over 130 percent from the 2000 level of 13 percent. And while this is the largest increase, the trends for processed vegetables and all-uses of potatoes are similar. The percent of domestic availability accounted for by imports of processed vegetables has increased over 100 percent, from 10 percent in 2000 to 22 percent in 2016, and the percent of potatoes imported has risen 75 percent, from 9 percent in 2000 to 16 percent. The increases shown are largely driven by more volume from Mexico, whose exports of fresh vegetables to the U.S. rose 12 percent in the last calendar year, continuing a long-running trend that began in 2001.

Table 4—Vegetable trade shares by year

	2014	2015	2016p	Change 2015-16
Percent of use imported[1]	---------- *Percent* ----------			
Fresh vegetables[2]	23.4	23.7	26.0	10
Canned vegetables	15.2	18.6	18.4	-1
Frozen vegetables	27.6	27.6	30.3	10
Other processing[3]	6.9	7.0	7.9	12
Percent of supply exported[4]				
Fresh vegetables[2]	6.9	6.5	7.1	9
Canned vegetables	15.9	15.0	14.3	-5
Frozen vegetables	15.9	15.3	16.7	9
Other processing[3]	18.7	20.6	17.9	-13

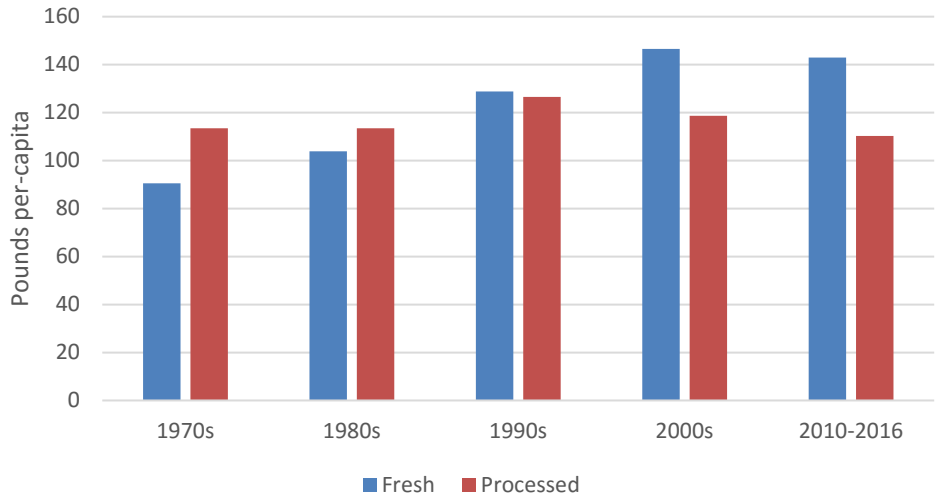
p = preliminary. [1]Percent of annual utilization imported. [2]Includes fresh potatoes, mushrooms, and sweet potatoes. [3]Includes dehydrated and chip products. [4]Percent of annual supply exported
Source: USDA, Economic Research Service

U.S. Per Capita Availability

The modest decrease in U.S. domestic vegetable production did not translate to lower domestic availability, due in part to the robust expansion of imports and only a slight increase in exports. According to preliminary data, per capita availability (previously called disappearance or use) of vegetables and pulses in the United States averaged 383 pounds in 2016; up 2 percent from 2015 but still down 10 percent from the peak of 425 pounds in 2000. Canning vegetables, particularly tomato products, accounted for the majority of the increase in domestic vegetable availability between 2015 and 2016.

The availability data measure supplies of commodities moving through production and trade channels for domestic use. The data do not directly measure food intake, but they serve as useful indicators for understanding trends over time. In addition, the data are not adjusted for spoilage and other losses. Thus, when used in this manner, the data provide an upper-bound on the amount of food available for domestic use and consumption.

Figure 3: Average per capita availability of fresh and processed vegetables by decade, 1970s-2010s[1]

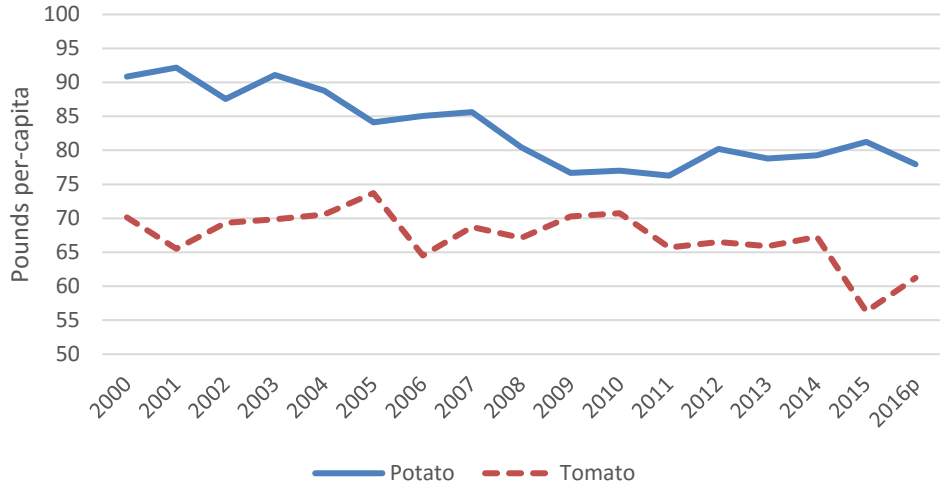


[1]Excludes potatoes, sweet potatoes, mushrooms, and dehydrated products.
Source: USDA, Economic Research Service

The decline in total vegetable-and-pulse availability between 2000 and 2016 was largely driven by potatoes and tomatoes for processing. Per capita availability of potatoes for processing markets declined 14 percent, from 91 pounds in 2000 to 78 pounds in 2016. Likewise, processing-tomato availability has decreased 13 percent, from 70 pounds to 61 pounds, since 2000. Although the overall trend is down, per capita availability of processing tomatoes rebounded slightly between 2015 and 2016, supported by drawdowns in inventory carried over from 2015.

The expansion of exports also put downward pressure on vegetable and pulse availability in the domestic market. The percent of U.S. vegetable-and-pulse supply exported to foreign markets has increased significantly, from 11 percent in 2000 to 20 percent in 2016. In particular, exports of canned vegetables (mainly processed tomatoes) increased by 154 percent, from 3.5 billion pounds in 2000 to 9.0 billion pounds in 2016, and frozen vegetables (mainly frozen potatoes) increased by 77 percent, from 3.2 billion pounds in 2000 to almost 5.7 billion pounds.

Figure 4: Per capita availability of processed potatoes and tomatoes, 2000-2016



Source: USDA, Economic Research Service.

Fresh-Market Vegetables

Total per capita availability of fresh vegetables (including potatoes, sweet potatoes, and mushrooms) averaged 188 pounds in 2016—up 1 percent from 2015, but holding fairly steady since 2008. In 2016, per capita use increased for many fresh-market crops—asparagus, bell pepper, cucumbers, garlic, lettuce, and squash, among others. In contrast, use of cabbage, carrots, cauliflower, celery, spinach, sweet corn, among others, declined. Despite these declines, fresh vegetable per capita availability, excluding mushrooms, potatoes, and sweet potatoes, was up 2 percent from the previous year to 145 pounds.

Despite continued declines in production from California, where the majority of fresh-market vegetables are grown, other significant contributors like Florida and Arizona increased their production levels in 2016. This increase, coupled with increased import levels across commodities, contributed to the modest increase in domestic use of fresh-market vegetables.

In terms of shares, potatoes, tomatoes, onions, all lettuce, and bell peppers accounted for a 60-percent share of fresh vegetables available for consumption in 2016, largely unchanged from previous years.

Table 5—Fresh-market vegetables: Per capita availability[1]

Selected items	2014	2015	2016p	Change 2015-16
	-------Pounds per capita-------			*Percent*
Artichokes, all	1.4	1.4	1.4	-1
Asparagus	1.6	1.5	1.5	5
Bell pepper	10.7	10.7	11.4	6
Broccoli	6.6	7.4	7.6	2
Cabbage	6.7	6.3	5.8	-8
Carrots	8.5	8.8	7.8	-11
Cauliflower	1.3	1.7	1.5	-15
Celery	5.5	5.4	5.0	-8
Cucumbers	7.4	7.5	8.0	7
Eggplants	0.8	0.8	0.8	-1
Garlic, all	2.2	2.4	2.6	11
Southern greens[2]	2.8	2.4	2.5	4
Head lettuce	14.5	13.5	14.9	10
Romaine/ leafy lettuce	10.8	11.0	12.3	12
Onions, bulb	18.3	18.9	18.7	-1
Snap beans	1.5	1.6	1.7	6
Spinach	1.7	1.7	1.5	-11
Squash	4.6	4.6	5.1	10
Sweet corn	7.6	8.6	7.3	-16
Tomatoes[3]	20.5	20.5	21.3	4
Others[4]	6.4	4.3	5.8	35
Subtotal	141.5	141.2	144.5	2
Mushrooms	2.7	2.9	3.0	3
Potatoes	33.6	34.1	33.2	-3
Sweet potatoes, all	7.5	7.6	7.2	-4
Total	185.3	185.8	187.9	1

p = preliminary. [1]Availability (disappearance or use) is an imperfect proxy for calendar year consumption. [2]Collards, kale, mustard greens and turnip greens. [3]Includes both domestic and imported hothouse tomatoes. [4]Includes Brussel sprouts, escarole, endive, okra, lima beans, and pumpkins.
Source: USDA, Economic Research Service, Vegetables and Pulses Yearbook (April 2017).

Processing-Market Vegetables

In 2016, total per capita processed-vegetable availability (potatoes and mushrooms included) averaged 187 pounds—up 1 percent from 2015. Further, per capita availability of processed-vegetables, excluding mushrooms, onions, and potatoes, increased 5 percent from the previous year to 107 pounds. Canning vegetables, particularly processing tomatoes, accounted for the majority of the increase in domestic availability. Although production of vegetables for processing decreased, increased inventories held over from 2015 and growing imports largely substituted for new production. For instance, although ending stocks of canning vegetables remained steady from 2015, they rose more than 24 percent from 2014 levels, and 2016 imports rose 8 percent from the previous year.

Per capita availability of potatoes for the processing market decreased 4 percent, from 81 pounds in 2015 to 78 pounds in 2016, which continues a gradual decline since the peak of 95 pounds in 1996. The decline is largely driven by downward trends in freezing, which make up over 50 percent of processing potatoes, and canning. Potato chips and dehydrated potato products have remained relatively steady over the last decade.

Despite the modest increase in per capita availability of processing vegetables, the long-term trend continues downward. Historically, availability of processing vegetables declined 11 percent between 2000 and 2016, mainly due to a drop in processing-potato use, followed by a drop in sweet corn, tomatoes, and pickles. In terms of share, processing potatoes and tomatoes accounted for 74 percent of vegetables for processing.

Table 6—Vegetables for processing: Per capita availability (disappearance or use)[1]

Selected items	2014	2015	2016p	Change 2015-16
	-------Pounds per capita---------			*Percent*
Canning				
Asparagus	0.1	0.1	0.1	19
Beets	0.5	0.5	0.5	-1
Cabbage	1.1	1.2	1.3	12
Carrots	0.7	0.7	0.9	33
Chile peppers, all	7.2	7.1	7.7	8
Cucumbers[2]	3.9	3.4	3.2	-7
Green peas	0.7	0.8	0.8	-3
Snap beans	2.8	2.9	3.2	8
Spinach	0.1	0.1	0.2	4
Sweet corn	5.8	5.3	5.1	-5
Tomatoes	67.2	56.3	61.2	9
Other canning	1.8	2.2	2.3	8
Subtotal	92.0	80.8	86.5	7
Freezing				
Asparagus	0.1	0.1	0.2	30
Broccoli	2.6	2.6	2.5	-3
Carrots	1.2	1.4	1.6	17
Cauliflower	0.4	0.3	0.4	7
Green peas	1.6	1.5	1.1	-23
Snap beans	1.8	1.9	2.0	4
Spinach	0.8	0.7	0.7	-6
Sweet corn	7.7	8.0	7.6	-5
Other freezing	3.8	3.9	4.0	1
Subtotal	19.8	20.4	20.0	-2
Processing Subtotal	111.8	101.2	106.5	5
Mushrooms for processing	1.0	1.1	1.0	-1
Onions for dehydrating	1.4	1.4	1.6	17
Potatoes for processing[3]	79.3	81.3	78.0	-4
Total	193.5	184.9	187.1	1

p = preliminary. [1]Availability is an imperfect proxy for calendar year consumption. [2]For pickling. [3]Includes french fries and other frozen potato products, chips, and others.
Source: USDA, Economic Research Service, Vegetables and Pulses Yearbook (April 2017).

Dry Peas, Lentils, and Chickpeas

Production

For the third year in a row, U.S. farmers are projected to increase area planted to lentils and chickpeas. Total lentil area is projected at a record 1.055 million acres, an increase of 122,000 acres over the plantings estimated for 2016 and more than double the number of acres planted in 2015, when seedings began the recent rally. In 10 years' time, lentil planted area has more than tripled, boosted by expanding sales to India and growing domestic consumption, both of which have supported prices and encouraged plantings.

Table 7--Dry peas and lentils: Planted area

Item	2014	2015	2016	2017 1/	Change 2016-17
	---------- *1,000 acres* ----------				*Percent*
Dry peas	935.0	1,143.0	1,382.0	1,141.0	-17
Austrian winter peas	18.0	34.0	38.0	26.0	-32
Lentils, all	281.0	493.0	933.0	1,055.0	13
Chickpeas, total	215.1	207.5	325.3	498.0	53
Small chickpeas	66.6	71.7	110.8	--	--
Large chickpeas	145.5	130.6	209.2	--	--
Total	1,661.2	2,079.8	2,998.3	2,720.0	-9

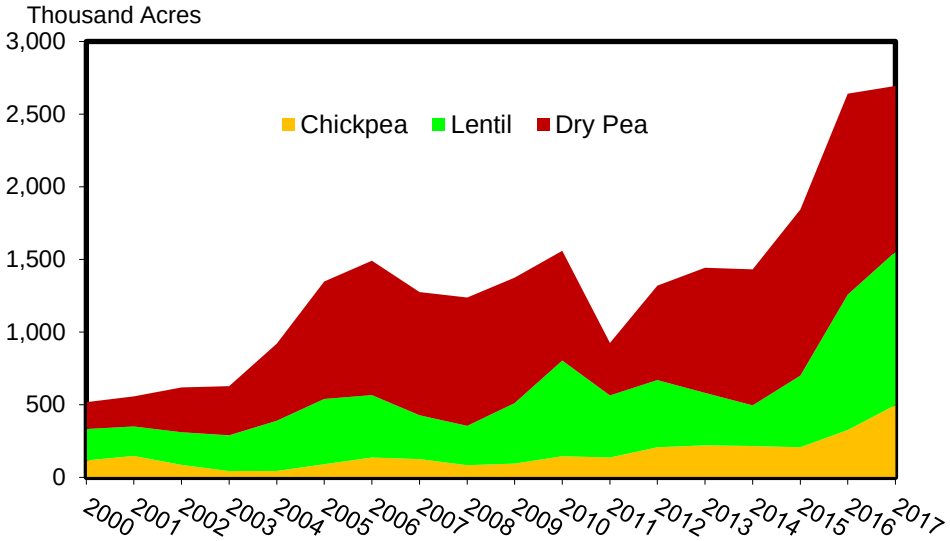
--indicates data not available.

1/ Intended plantings in 2017 as indicated by farmers and published in *Prospective Plantings*.

Sources: USDA, National Agricultural Statistics Service, *Crop Production* and *Prospective Plantings*

With a 53-percent and 173,000-acre gain in expected seedings, chickpea planted area is forecast to rise to nearly 500,000 acres, based on the sustained strength of chickpea prices and favorable returns relative to other crops such as wheat and corn. Area seeded to dry peas has similarly risen in recent years, expanding plantings from 362,000 acres in 2011 to a new record of 1.382 million in 2016.

Figure 5: U.S. dry pea, lentil, and chickpea planted area



Source: USDA, National Agricultural Statistics Service.

Dry peas are the only category of pulse crops projected to have fewer acres planted in 2017. Although down 17 percent to 1.141 million acres, farmer-reported expectations for dry pea area seeded remain well above the 5-year average area planted of 993,000 acres. The majority of the 241,000-acre decline in dry pea area is in Montana, where farmers are expecting to seed 150,000 fewer acres. However, much of the lost dry pea area in Montana will be planted to lentils (up 120,000 acres) and dry beans (up 107,000 acres), in aggregate lifting Montana's 2017 pulse plantings by 77,000 acres.

Dry pea, lentil, and chickpea production is concentrated in Montana and North Dakota, where 48 and 30 percent (respectively) of projected 2017 acres are expected to be planted. On net, dry pea, lentil, and chickpea planted area, including Austrian peas, is projected to rise by 41,700 acres in 2017 with five of eight States expecting increased seedings.

Trade

Expansion in dry pea, lentil, and chickpea cultivation has been spurred by strong demand from export markets, notably, from an increasingly important trading partner, India. In 2015 and 2016, the monsoon season in India brought below-average precipitation and resulted in a relatively small pulse crop harvest. To supplement domestic production, the Indian Government and private traders expanded imports of many sustenance goods, including wheat and pulses such as lentils. Traditional suppliers Canada and Australia also benefited from growth in trade with India; however, the United States emerged as an important secondary provider of largely high-quality green and yellow lentils.

Table 8--U.S. Dry Peas, Lentils: Export Volume by Class

	July-June			July-Feb.		Year-to-Date Change
Item	2013/14	2014/15	2015/16	2015/16	2016/17	16/17-15/16
	---------- *1,000 cwt* ----------					*Percent*
Exports:						
Green peas	3,594.0	2,890.3	2,148.1	1,237.9	2,911.8	135
Yellow peas	2,919.6	3,463.8	3,517.7	2,630.8	2,825.2	7
Split peas	1,532.2	1,413.1	2,579.3	1,186.1	771.4	-35
Austrian winter pea	44.5	16.8	11.1	10.6	17.0	61
Misc. dry peas	1,545.4	2,322.0	2,457.1	1,948.6	1,337.3	-31
Chickpeas, all 1/	1,030.2	889.8	1,188.5	880.3	2,016.0	129
Lentils, all	3,539.7	5,603.9	4,503.6	3,693.4	5,430.5	47
Planting seed, all	799.5	849.5	1,075.0	739.4	2,081.1	181
Total (without seeds)	14,205.6	16,599.7	16,405.4	11,587.7	15,309.2	32
Total (with seeds)	15,005.1	17,449.2	17,480.4	12,327.1	17,390.3	41

1/ Chickpea marketing year is September-August.

Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau.

Exports to India have slowed slightly in the last few months as a good monsoon boosted the harvest prospects of most crops there; however, exports to date are 6 percent above the same period (July-February) for the 2015/16 marketing year. Recently, there have been indications that the Indian Government is looking to slow imports and support domestic prices by reimplementing trade restrictions. Among the indications are a reinstatement of import duties on some crops and announced intentions to require fumigation with methyl bromide at the site of inspection of the exporting nation. For many years, the U.S. and Canada have been granted an exception from this costly requirement; however, by the end of March 2017, no exceptions had been formally announced.

With 2 months remaining in the 2016/17 marketing year and 4 months until trade data through June 2017 are available, indications are that dry pea and lentil exports, inclusive of chickpea shipments, will exceed sales of the previous year. Sales through February are more than 5 million pounds larger than for the same period during the 2015/16 marketing year and have been augmented by significant food aid shipments.

Table 9--U.S. Dry Pea and Lentil Marketing Year Export Volume, by Selected Destination 1/ 2/ 3/

	July-June			July-Feb.		Change
Destination	2013/14	2014/15	2015/16	2015/16	2016/17	16/17-15/16
	1,000 cwt					*Percent*
India	4,712.3	6,925.4	5,899.5	4,628.0	4,896.2	6
China	1,363.2	1,602.3	1,008.5	746.8	1,177.3	58
Djibouti 4/	385.5	599.2	547.9	318.7	302.8	-5
Canada	532.0	753.1	490.9	351.9	2,130.9	506
Italy	267.8	301.7	298.1	223.8	287.8	29
Kenya	512.6	349.0	283.3	194.0	271.2	40
Columbia	183.7	240.6	262.3	164.7	279.1	69
Ethiopia	110.6	11.9	127.0	127.0	562.4	343
Dominican Republic	9.3	20.1	38.4	33.7	56.4	67
Other	6,132.6	3,402.2	7,643.9	4,799.0	5,345.0	11
Total	14,209.5	14,205.6	16,599.7	11,587.7	15,309.2	32

1/ Includes commercial sales and movement under food aid programs such as PL-480. 2/Chickpea marketing year is September-August.
3/ Includes chickpeas, Austrian peas; excludes seeds. 4/Food aid shipments to Ethiopia are often routed through Djibouti.
Source: U.S. Department of Commerce, U.S. Census Bureau.

Growth in export sales have been particularly strong for green peas, chickpeas, lentils, and planting seeds. Sales to India and China have remained strong in the current marketing year. Food aid shipments in 2016/17 have expanded as the United States helps to address the challenges of severe drought and famine in East Africa and, in particular, Ethiopia. Food aid shipments to Ethiopia frequently travel through transit ports in Djibouti, which, through the first 8 months of the 2016/17 marketing year, has remained a top-3 destination for U.S. dry pea and lentil exports for the second year in a row. Shipments of lentils to Canada, the world's top lentil exporting country, have surged through the first 8 months of the current marketing year after rain and snow at harvest time in 2016 damaged what was anticipated to be a bumper Canadian crop. A significant year-to-year increase in lentil exports to Canada has helped increase total U.S. lentil shipments through the first 8 months of the marketing year by 47 percent over the same period in 2015/16.

Price

Strong demand and tight dry pea and lentil supplies for 2014/15 and 2015/16 created upward pressure on prices to which farmers responded by planting record-large numbers of acres in 2016. Aggregate dry pea and lentil production in 2016/17 reached a record-high of 4.042 million pounds and despite strong export sales and increased domestic use, a loosening balance sheet and generally weaker commodity prices have put downward pressure on dry pea and lentil prices moving into the 2016/17 marketing year. Monthly dry pea and lentil prices are generally lower than for the same month a year ago. Chickpea prices have shown resilience, and some monthly prices for 2016/17 are above the same time last year. However, expectations of sizable domestic production and stocks are expected to lower season-average price prospects. Season average prices for all three categories are projected down in 2016/17 compared to 2015/16.

Table 10--U.S. dry peas and lentils: Monthly grower prices by class, 2015/16 and 2016/1

	Dry peas 1/		Chickpeas All 2/		Lentils	
	2015/16	2016/17	2015/16	2016/17	2015/16	2016/17
Month	----------cents per pound----------					
July	11.3	11.6	29.9	33.8	30.1	36.5
August	10.6	10.5	28.6	31.8	25.8	27.2
September	12.3	10.4	28.6	30.2	28.2	26.6
October	10.9	13.7	26.6	26.2	29.4	27.1
November	12.1	11.0	27.0	30.3	31.8	27.6
December	12.5	11.2	27.2	32.2	30.2	31.5
January	13.2	10.7	28.8	31.6	31.6	29.2
February	14.9	11.5	28.9	30.6	36.0	31.5
March	13.7	--	29.2	--	38.8	--
April	17.3	--	28.4	--	36.2	--
May	16.7	--	29.0	--	42.7	--
June	13.0	--	30.4	--	40.4	--
Marketing Year Price	12.8	10.8	28.7	--	31.0	27.7

-- = not available. 1/Dry pea and lentil marketing year is July-Jun. 2/Chickpea marketing year is Sept-Aug.
Source: USDA, National Agricultural Statistics Service, *Agricultural Prices* .

Per Capita Availability

Growth in domestic demand, especially for chickpea-containing products such as hummus, have helped to support prices and encourage expanded proportional and absolute growth in production. Increased domestic supplies have lifted the per capita availability forecast for chickpeas for the last 2 years. For 2017, per capita chickpea availability is forecast at 1.85 pounds per person, up from 1.21 pounds per person in 2016.

Greatly expanded production of lentils, spurred by expanded exports and relatively strong prices, has also helped to increase domestic supplies. Expansion in supplies more than offset increased exports and helped to lift per capita lentil availability by more than a pound over the past 5 years. For 2016/17, per capita lentil availability is estimated at 1.62 pounds per person, up from 0.55 pound in 2010/11.

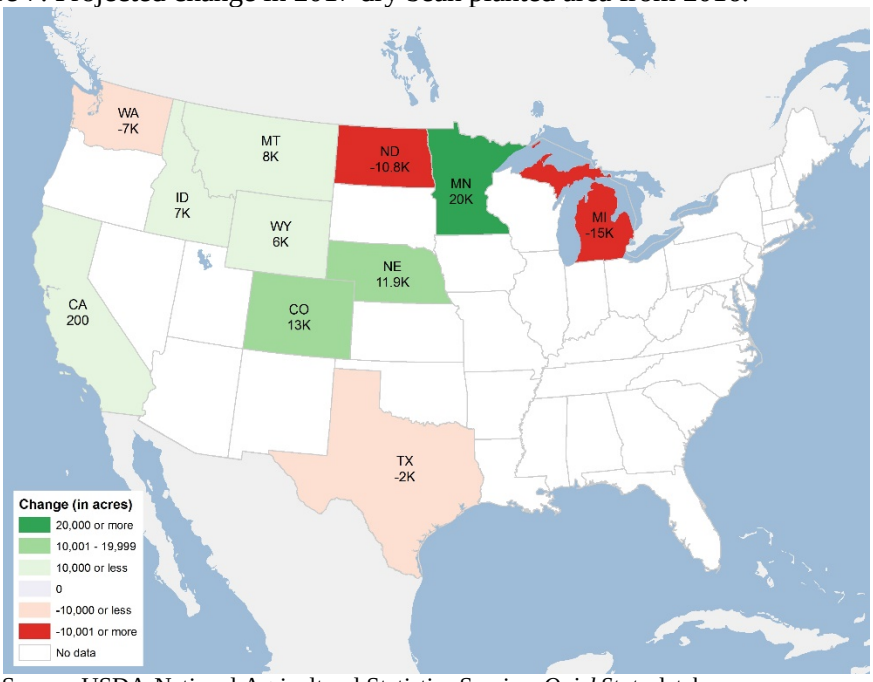
Dry Edible Beans

Production

Area planted to dry beans, exclusive of garbanzo beans (also known as chickpeas, and reported in the previous section), is projected to have a modest increase, up about 2 percent to 1.368 million acres and marginally lower than the 10-year average planted area of 1.415 million acres. Modest projected increases for the majority of dry bean classes, including pintos, help to offset projected slight reductions in navy and black bean plantings.

Farmers in California, Colorado, Idaho, Minnesota, Montana, Nebraska, and Washington State are projected to add a collective 54,200 acres of dry beans (excluding garbanzo beans) in 2017 as compared to 2016. Michigan, North Dakota, Texas, and Washington are projected to reduce plantings by a total of 34,800 acres. Relatively high soybean prices are behind a surge in soybean plantings in the first three States (up 280,000 acres, 850,000 acres, and 15,000 acres, respectively) and are likely to be drawing some acres out of dry bean production.

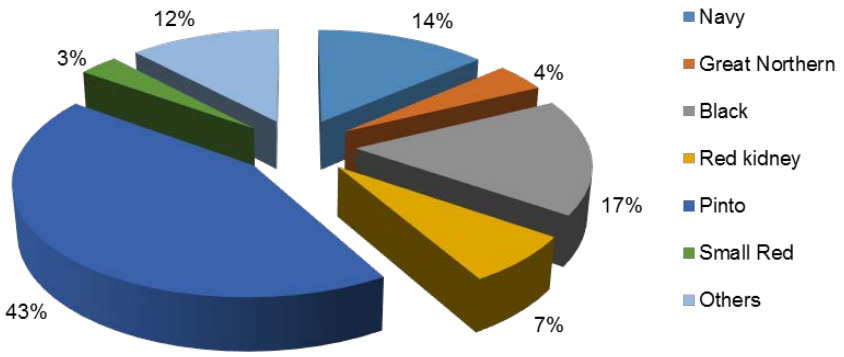
Figure 7. Projected change in 2017 dry bean planted area from 2016.



Source: USDA-National Agricultural Statistics Service, *QuickStats* database.

Expanded acreage helps to lift projected 2017 dry bean production, exclusive of garbanzo beans, to 2,434 million pounds, an increase of about 4 percent over the previous year. In 2016, generally favorable weather in many dry bean-growing States helped to lift yields above trend averages. While a return to normal weather--and, consequently, more typical yields--is projected at this point in the season, spring weather so far in 2017 suggests that Northern States may experience slightly cooler and wetter conditions. Despite some recent precipitation, Central and Southern U.S. dry bean-growing States, including Colorado, Nebraska, Oklahoma, and Wyoming, are experiencing abnormally dry to severe drought conditions. USDA-NASS's weekly *Crop Progress* reports provide evidence that prolonged dryness in these areas has affected crops such as wheat and corn. Although not yet noted in the *Crop Progress* report, it is anticipated that these dry circumstances will likely affect bean cultivation conditions.

Figure 8: Projected 2017 dry bean production, by class 1/



1/ Excludes garbanzo bean production.
Sources: USDA, National Agricultural Statistics Service, *Crop Production* and USDA, Economic Research Service

By class shifts in 2017, exclusive of garbanzo beans, are relatively minor. Pinto beans are expected to increase their share of production by 2 percent in 2017 to 43 percent of total production, following a 6-percent increase in 2016. Consecutive increases in absolute and relative pinto bean production are largely attributable to rising pinto bean planted area. Black bean's share of production is projected to fall slightly in 2017 to 17 percent, down from 19 percent in 2016 and 20 percent in 2015. Between 2015 and 2016, black bean planted area fell by 102,000 acres or nearly 31 percent. High yields in 2016 helped to offset the effects of reduced acreage on production and to largely preserve the share of total production represented by black beans. A slight year-to-year increase in planted and harvested area is forecast, but combined with a return to trend yields, black bean production in 2017 is estimated to decline by about 7 percent from 2016.

Trade

All dry bean trade projections for calendar year 2017 are virtually unchanged from 2016 and are projected to total 1051 million pounds, compared to 1,030 million pounds for the prior year. U.S. dry bean imports are on track to increase by about 3 million pounds to just over 332 million, up from 324 million in 2016. Imports have remained relatively steady since peaking in 2014 at 342 million pounds, while exports have trended slightly down from a high of 1,237 million in the 2012. The relatively high value of the U.S. dollar is a likely cause for steady-to-lower export volumes, while growing domestic demand consumes proportionally more of total dry bean supplies.

A nearly flat aggregate export figure mask notable shifts across classes. For calendar year 2016, black, pinto, and light-red kidney beans had sizable year-to-year increases, while exports of navy beans offset gains for other classes by falling nearly 25 percent. Despite the decline in export sales and share, navy bean sales still accounted for the largest proportion, about 22 percent, of all U.S. dry bean exports in 2016. Navy beans' share of total export sales has declined significantly in recent years, down from 38 percent in 2014, and is now only slightly larger than pinto's share (20 percent) of all dry bean export sales (excluding garbanzo beans).

Figure 9: U.S. Dry Bean Trade

p = preliminary, f = forecast.
Source: USDA, Economic Research Service using data of the U.S. Department of Commerce, U.S. Census Bureau.

Table 12—U.S. dry bean calendar year export volume 1/

Bean class	2014	2015	2016p
	---------- *1,000 cwt (bags)* ----------		
Black	1,003.1	965.4	1,300.0
Pinto	947.3	1,313.8	1,945.5
Small red	386.7	302.4	130.0
Navy	4,108.8	2,819.4	2,121.4
Dark-red kidney	898.4	945.0	801.1
Light-red kidney	87.9	100.2	247.2
Other	2,228.5	3,379.9	1,272.1
Total	10,726.7	10,809.4	9,805.0

p = preliminary. 1/ Excludes garbanzo beans.
Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau.

Export volume to Mexico, a major U.S. black bean export market, has recovered somewhat from the recent lows in 2014 and 2015, but still remains below average sales levels of 5 to 10 years ago. North American Free Trade Agreement partner countries accounted for more the 40 percent of total U.S. exports in 2016, and Mexico or Canada have been the top two destinations for U.S. exports of dry beans for nearly a decade. In 2016, Brazil emerged as a new top-10 export destination, and small sales have been noted in the early months of 2017.

Table 13—U.S. dry bean calendar year export volume, by selected destination 1/

Destination	2013	2014	2015	2016p
	---------- *1,000 cwt (bags)* ----------			
Mexico	2,584.4	1,763.5	1,738.5	2,880.1
Canada	1,585.8	2,248.0	1,599.5	1,512.9
United Kingdom	500.2	455.4	984.0	810.4
Dominican Republic	903.1	1,156.7	969.5	748.9
Italy	502.9	646.0	741.9	589.1
Brazil	4.5	2.7	7.4	280.8
South Africa	100.9	135.9	46.8	240.5
Haiti	178.3	71.2	372.9	226.3
France	220.3	410.3	297.9	226.1
Colombia	40.2	85.0	175.5	221.3
Other	3,120.2	3,701.1	2,087.1	2,035.2
Total 2/	9,740.8	10,675.8	9,021.0	9,771.6

p = preliminary. 1/ Includes commercial sales and movement under food aid programs such as PL-480. 2/ Excludes garbanzo bean volume and includes seed.
Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau.

Dry bean imports, which augment domestically grown production and stocks, generally represent less than 10 percent of total dry bean supplies. The import share of supplies fell slightly in 2016, to 7.6 percent, on reduced import volumes and increased domestic production. Dry bean imports totaled approximately 325 million pounds in 2016, down from 342 in 2015. For 2017, imports are projected to rise slightly to 332 million pounds, while the share of total supply is expected to remain on par with 2016 levels.

Table 14—U.S. dry bean calendar year import volume 1/

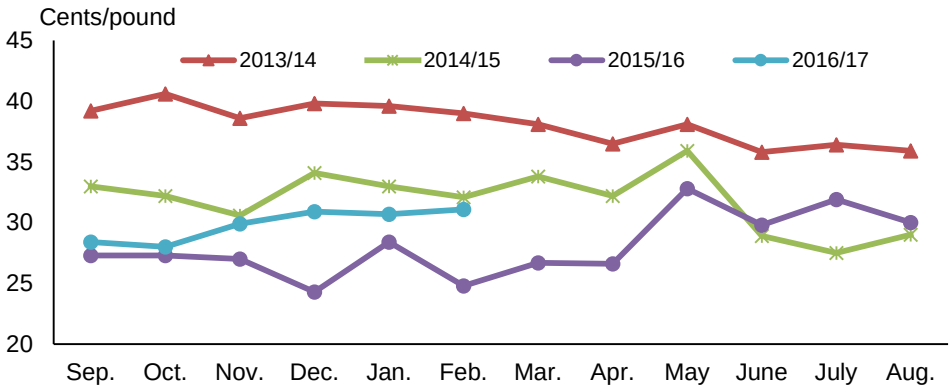
Bean class	2014	2015	2016p
	---------- *1,000 cwt (bags)* ----------		
Black	357.8	440.6	327.6
Pinto	234.8	139.4	163.2
Small red	74.2	109.1	120.9
Navy	100.1	39.9	58.3
Dark-red kidney	262.2	150.0	62.8
Light-red kidney	130.8	292.4	187.8
Other	1,372.8	1,481.9	1,442.0
Total	2,646.0	2,648.6	2,499.2

p = preliminary. 1/ Excludes garbanzo beans.
Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau.

Prices

Average monthly grower prices for dry beans in 2016/17 have exceeded 2015/16 prices in each month of the current marketing year and underpin expectations for a 2016/17 season-average all-dry-bean price at or near the 2015/16 estimate, if normal seasonal pricing patterns persist. In spring of 2016, all dry bean prices were lifted more than is seasonally expected due to tight garbanzo bean supplies. With expanded supplies projected for the current marketing year, May prices are expected to be within the normal range and to support the current ERS 2017 forecast all dry bean price of $28.50 per hundredweight (cwt), a decline of about $2 per cwt from 2016.

Figure 10
U.S dry edible beans: Average monthly grower price

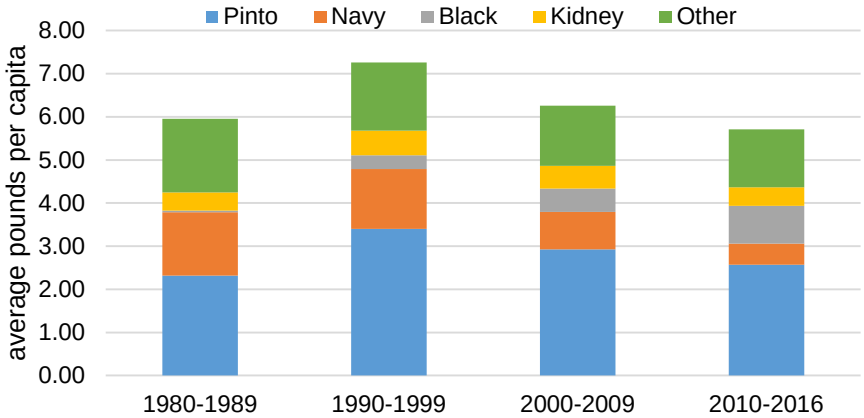


Source: USDA, National Agricultural Statistics Service, *Agricultural Prices.*

Per Capita Availability

All dry bean per capita availability, minus garbanzo beans, for 2017 is projected at 5.7 pounds per person and on par with the 2016 projection. Preliminary by-class supply and use projections indicate reduced per capita availability of all white beans, down 0.65 pound per person in 2016 to 0.49 pound in 2017. The decrease is largely due to a tightened navy bean balance sheet that features reduced production and expectations of a slight year-to-year increase in exports. Per capita availability of pinto beans is expected to rise from 2.45 pounds to 2.9 pounds per person, based on a projected 88.7 million pound production increase not offset by increased exports or seed use.

Figure 11: U.S. dry edible bean per capita availability



Source: USDA-Economic Research Service.

Pinto beans comprise the largest proportion of per capita availability, ranging from an average of 2.32 pounds per capita in 1980 to 2.57 pounds from 2010 to 2016. Other dry bean have comprised, on average, between 1.71 pounds per capita (1980s) to 1.34 pounds in the most recent period (2010-2016). The most variable category, navy beans, has contributed between 0.49 pounds per person to nearly 1.47 pounds, in part due to variable levels of supply and use, as well as a high degree of substitutability with great northern beans. In contrast, kidney bean per capita availability is relatively steady and has averaged between 0.43 pounds to 0.57 pounds. On the whole, per capita availability of dry beans, excluding garbanzos, has ranged between 5.9 pounds per person in the 1980s to as high as 7.2 pounds in the 1990s, and down to 5.7 pounds in the most recent period.

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Vegetable and Pulses Data provides users with comprehensive statistics on fresh and processed vegetables and pulses in the United States, as well as global production and trade data for these sectors. It harmonizes and integrates data from the ERS market outlook program with data collected by different Federal and international statistical agencies to facilitate analyses of economic performance over time, and across domestic and foreign markets.

The data are currently organized in three sections:

Yearbook Tables, in Excel and a single PDF file, contain a time series of annual data for U.S. farm acreage, production, prices, trade, per capita use, and more. Eventually, data contained in the Vegetables and Pulses Yearbook tables will be encompassed in the Data by Category and Data by Commodity series.

Data by Category (e.g. price, trade production) provides current import and export data, producer and retail price indexes, and a few retail prices.

Data by Commodity provides current import and export data for more than 40 individual fresh and processed vegetable and pulse commodities.

Web Sites

ERS Vegetables and Pulses Data: The home page for Vegetables and Pulses data. http://www.ers.usda.gov/data-products/vegetables-and-pulses-data.aspx

Vegetables and Pulses Topics Page: This ERS site contains some background information on the U.S. vegetable and dry pulses sectors, special articles, and links to more vegetable and pulses information.
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USDA AMS Market News: Agricultural Marketing Service's web site containing fresh shipments, f.o.b. and terminal market prices, weekly truck rates, annual reports, and more. https://www.marketnews.usda.gov/mnp/fv-home

USDA FAS Trade Data—GATS: This online application allows the user to freely access and download detailed U.S. export and import data.
http://www.fas.usda.gov/gats/default.aspx

NASS Vegetables: Links to USDA, National Agricultural Statistics Service's annual reports on vegetables & melons.
http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1183

FAS Fruit and Vegetable Analysis Page: USDA, Foreign Agricultural Service's page with special articles, country horticultural reports, presentation and charts, data, and links.
http://www.fas.usda.gov/commodities/fruits-and-vegetables

United States Department of Agriculture

Economic Research Service

Situation and Outlook

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Vegetables and Pulses Outlook: Special Article

Monitoring Trends in Retail Prices and the Farm Value of Fresh Vegetables[1]

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Approved by the World Agricultural Outlook Board.

Prices paid by consumers for fresh vegetables typically fluctuate with prices received by farmers. However, a food's retail price and farm-level value do not rise and fall in tandem. In 2015, for example, the farm value of a market basket of 16 fresh vegetables rose by 11 percent as drought effects reduced shipment volumes from California. However, consumers paid only 1.6 percent more for the same basket as lower oil prices and a strong U.S. dollar mitigated retail price increases. This combination of sharply higher farm prices and moderately higher retail prices drove the farm share of the basket's retail cost to a high of 28 percent. The farm share of retail fresh vegetable prices has averaged about 25 percent over the past decade, ranging from 23 to 28 percent.

Additionally, ERS reports measures of the relationship between farm and retail food prices. These assess the amount of value added to farm commodities through marketing services such as processing, advertising, and retailing. For both our market basket of 16 fresh vegetables and all 4 individual foods, ERS reports the farm share of the retail price. It is calculated as the ratio of a food's farm value to its retail value and represents the portion of the retail price attributable to farm receipts in percentage terms. For the market basket of 16 fresh vegetables, ERS also reports the farm-to-retail price spread, which is calculated as the difference between the value of the foods at retail stores and their value at the farm gate, and likewise represents value added by marketers in absolute terms.

In the short run, retail fresh vegetable prices may move independently of farm prices if marketers do not fully pass along price increases or decreases; rather, marketers may absorb some of those gains and losses. This can cause farm-to-retail price spreads to expand or contract, and the farm share of the retail food prices to fall or rise. In the long run, farm and retail-level prices may trend closer together or farther apart with changes in the mix and cost of services required to provide final products to consumers. Increased consumer demand for baby carrots, bagged spinach, and broccoli florets relative to whole carrots, bunches of spinach, and broccoli crowns, for example, could grow the farm-to-retail price spread, weighing down the farm share of retail fresh vegetable prices to the extent that higher value-added products embody a different and relatively more expensive mix of marketing inputs.

[1] Hayden Stewart is an economist with the Food Economics Division, Economic Research Service, USDA.

Price Trends for Individual Foods

Government agencies collect data on retail food prices and on prices received by farmers for agricultural commodities. For fresh-market, field-grown tomatoes, and other individual foods, ERS starts with monthly, national-average retail prices reported by the Bureau of Labor Statistics (BLS). For example, in January 2016, American consumers paid $2.53 per pound for fresh field-grown tomatoes. In July 2016, they paid $1.64 per pound. A simple average of the 12 monthly 2016 retail prices is $1.93 per pound. Monthly, national-average prices reported by USDA's National Agricultural Statistical Service (USDA-NASS) represent prices received by farmers. In January 2016, American farmers received $1.08 per pound for fresh-market field-grown tomatoes. In August 2016, they earned $0.28 per pound. A simple average of the 2016 monthly farm prices is $0.48 per pound.

To calculate farm-to-retail price spreads and the farm share of retail food prices, ERS further accounts for phenomena like loss and shrinkage that typically occur as fresh vegetables move from the farm gate to retail stores. Some vegetables may spoil or need trimming. Thus, farmers typically supply more than one pound of vegetables for every one pound supplied by marketers at retail. Conversion factors are used to inflate the retail quantity by the necessary amount. Under the assumption that 10 percent of the volume of a shipment of field-grown tomatoes is lost, farmers must supply 1.11 pounds (1/0.9) for each pound sold at retail. In 2016, the farm share of the retail price was 27 percent ([1.11 x 0.48]/1.93 = 0.27).

Over the past decade, farmers have earned between 24 percent and 37 percent of the retail cost of fresh-market, field-grown tomatoes, with 2015 being a low year. The monthly-average price received by farmers fell from $0.48 per pound in 2014 to $0.39 per pound in 2015. However, retail prices continued to rise from $1.71 per pound per month in 2014 to $1.84 per pound in 2015, pulling the farm share down to 24 percent. In 2016, both retail and farm prices rose. The farm share of the retail price also recovered somewhat to 27 percent.

Over the past decade, farmers have earned between 21 and 31 percent of the retail price of fresh broccoli, with 2015 being a high year. Shipment volumes were down in 2015, and prices received by growers increased. The monthly-average price received by growers rose by 10 cents from $0.43 cents per pound in 2014 to $0.53 per pound in 2015. By contrast, the monthly-average retail price of broccoli rose only 3 cents from $1.76 per pound in 2014 to $1.79 per pound in 2015. This combination of price movements, in turn, raised the farm share of the retail price to a high of 31 percent. In 2016, retail prices, farm value, and the farm share of the retail price all retreated.

The farm share of iceberg lettuce's retail price has also fluctuated between 21 and 31 percent over the past 10 years. In 2015, similar to broccoli, shipments of head lettuce were down, prices received by growers increased, and the farm share of the retail price reached its highest level of the decade at 31 percent. In 2016, retail prices, farm value, and the farm share of the retail price all fell back toward 2014 values.

Farmers typically earn a smaller share of what consumers pay for fresh-market potatoes than they earn of retail prices for fresh field-grown tomatoes, iceberg lettuce, and broccoli. Over the past decade, farmers have received between 15 and 22 percent of the retail price of fresh potatoes, with 2015 and 2016 both being low years as retail prices rose while farm value remained stagnant.

Figure 1: Price and farm-share trends for selected fresh vegetables, 2007-2016

Source: Calculated by ERS, USDA, using data from the Bureau of Labor Statistics and the National Agricultural Statistics Service.

Price Trends for a Representative Market Basket

ERS also studies price trends for a market basket of 16 fresh vegetables that represents a typical household's purchases over 1 year. Greater weight is given to potatoes, onions, carrots, and tomatoes owing to the relatively larger quantities of these fresh vegetables that American households buy at retail stores. Specifically, ERS's fresh vegetables basket includes Agaricus mushrooms (3.12 pounds), asparagus (2 pounds), broccoli (6.71 pounds), cabbage (7.51 pounds), carrots (21.11 pounds), cauliflower (2.18 pounds), celery (5.34 pounds), cucumbers (6.79 pounds), iceberg lettuce (15.37 pounds), onions (24.22 pounds), potatoes (82.92 pounds), Romaine lettuce (7.97 pounds), sweet corn (4.38 pounds), sweet bell peppers (6.47 pounds), sweet potatoes (4.67 pounds), and tomatoes (20.91 pounds). A corresponding farm basket accounts for shrink and other losses and includes the quantities of farm-level fresh vegetables that farmers must supply in order for marketers to provide the final basket to consumers at retail.

Each year, ERS uses the Consumer Price Index for fresh vegetables reported by BLS to update the retail value of its fresh vegetable basket. ERS also uses season-average prices published by USDA's NASS to update its estimate of farm receipts for the basket's contents. In 2015, ERS's fresh vegetables basket cost $225.80 at retail stores and farmers earned $62.12 for the commodities necessary to supply that basket at retail. The farm-to-retail price spread was $163.68. On its website, ERS reports each of these values as an index (base year is 2001 = 100). For example, ERS estimates that the basket's farm value was $44.71 in 2001, so the farm value index was 139 in 2015 ([62.12/44.71] x100). Reporting the basket's farm value in index form helps to facilitate the interpretation of long-run trends in farm value similar to how BLS reports the value of the Consumer Price Index. Farm value share is reported in percentage terms.

As noted above, the farm share of ERS's retail market basket of 16 fresh vegetables has averaged about 25 percent over the past decade. In 2015, it rose to 28 percent. Higher farm prices for a broad range of fresh vegetables, including onions, carrots, and tomatoes, more than offset somewhat lower prices for fresh potatoes. According to ERS forecasts, while U.S. production of fresh-market vegetables was expected to increase somewhat in 2016, it was also expected to remain below 2014 values, putting continued upwards pressure on farm prices.

Figure 2: Retail cost, farm value, farm-to-retail price spread, and farm value share for fresh vegetables, 1997-2015

Fresh vegetables basket[1]				
Year	Retail cost	Farm value	Farm-to-retail spread	Farm value share
	2001 = 100			*Percent*
1997	84	90	82	30
1998	94	94	93	28
1999	91	85	93	26
2000	95	88	98	26
2001	100	100	100	28
2002	106	102	108	26
2003	109	101	111	26
2004	113	96	120	23
2005	118	108	122	25
2006	123	114	127	26
2007	127	112	133	24
2008	134	127	137	26
2009	130	117	135	25
2010	132	130	133	27
2011	140	126	145	25
2012	133	110	142	23
2013	139	137	140	27
2014	137	125	142	25
2015	139	139	140	28

[1]For a market basket of food bought in food stores in a base period, currently 1999-2003. The retail price index is derived from data from the U.S. Department of Labor, Bureau of Labor Statistics. Farm value is based on prices farmers received for commodities. The spread between the retail price and farm value represents charges for processing and marketing.
Source: Calculated by ERS, USDA, using data from the Bureau of Labor Statistics and the National Agricultural Statistics Service.

For More Information

For more information and the latest estimates of the farm share of fresh vegetables published by ERS, please see the online data product Price Spreads from Farm to Consumer http://www.ers.usda.gov/Data/FarmToConsumer/.