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Vegetables and Pulses Outlook

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Mushroom Production Reaches Record High

The next release is Dec. 18, 2012.

Approved by the World Agricultural Outlook Board.

Beginning in 2012, *Vegetables and Melons Outlook* has been renamed *Vegetables and Pulses Outlook* and will include four issues released in March, June, September, and December. Market analysis for potatoes and mushrooms will be included in the March and September 2012 reports. Market analysis for dry edible beans, dry peas and lentils, and sweet potatoes will be included in the June and December 2012 reports. Market analysis and data coverage for melons is now included in the *Fruit and Tree Nuts Outlook* and *Fruit and Tree Nuts Yearbook*. Market analysis of melons prior to 2012 can still be found in historical *Vegetable and Melon Outlook* reports.

Reduced shipments have relieved some downward pressure on fresh vegetable prices from early 2012, although prices for most vegetables still remain below levels from the previous year. Even with the realization of a hotter and drier summer than normal, volume remains above 2011 levels.

Production of tomatoes, sweet corn, snap beans, and green peas for processing under contract is expected to increase in 2012. Among the four commodities, only snap beans are expected to have a decrease in contract area harvested; although total production would not decline if anticipated yields are realized.

The potato crop in 2012 is expected to expand by close to 7 percent. While much of the potato area is dry this year, conditions are not as hot as other parts of the country and there is a 5.4-percent increase in anticipated harvested acreage.

Volume of mushroom production was an all-time high of 900 million pounds in 2011/12 with a farm value of $1.1 billion. The long-term trend of greater consumer use of fresh mushrooms relative to processed mushrooms is reflected in both production and import trends over the past 20 years.

Industry Overview

Fresh vegetables: There were reports of reduced summer plantings in response to low prices and July shipment volume of many fresh vegetables eased from highs of the previous month and earlier 2012. Total U.S. planted onion acreage declined almost 4 percent between 2011 and 2012 and asparagus production for the fresh market reached a low of 62.6 million pounds.

Processing vegetables: Production of tomatoes, sweet corn, snap beans, and green peas for processing under contract is expected to increase in 2012. Among the four commodities, only snap beans are expected to decrease in contract area harvested although total production will not decline if anticipated yields are realized. In the first seven months of 2012, the value of both imports and exports of processed vegetables increased by six percent compared to the same period in 2011.

Potatoes: The potato crop in 2012 is expected to expand by close to 7 percent from 429.6 million hundredweight (cwt) in 2011 to 459 million cwt. Through July, fresh-market potato prices are down approximately $2.75 per cwt from 2011 values, whereas processing prices show slight gains. The disposition of the 2011 crop shows a second year of increased share for processing potato sales and a lower share for table stock with the remainder going to seed and feed uses.

Mushrooms: The farm value of all mushrooms during the 2011/12 crop year (July-June) totaled a record $1.1 billion, up 8 percent from last season. The long-term trend of greater use of fresh relative to processed mushrooms is reflected in both production and import trends. Sales of fresh *Agaricus* mushrooms reached 771 million pounds in 2011/12. In the processing market, sales of *Agaricus* mushrooms dropped 13.4 percent from the previous year to 110 million pounds. Specialty mushrooms (excluding brown *Agaricus*) also increased in production volume, totaling 18 million pounds.

Chickpeas: Use of chickpeas (garbanzo beans) has increased in the United States as consumption of food such as humus expands. I n 2012, a record 196,900 acres were planted with Washington, Idaho, and California leading producers in the previous year. Two commercial varieties of chickpeas are Desi and Kabuli. Domestic use or consumption of Kabuli (large chickpeas) is generally three times that of Desi (small chickpeas), although the latter has grown rapidly in recent years. Crop production value of all chickpeas is projected to reach approximately $108 million in 2012 compared to $77 million in 2011.

Dietary Assessment of Vegetable Consumption: Over the past four decades, vegetables available for consumption in the U.S. food supply grew 17 percent. According to Loss Adjusted Food Availability data, the average American consumed 1.7 cups of vegetables (including legumes) per day in 2010; 11 percent above the 1970s amount of 1.5 cups, but well below the current *U.S. Dietary Guidelines for Americans* recommendation of 2.5 cups per person based on a 2,000-calorie-per-day diet.

Global Potato Trends: In the past 20 years, considerable changes have taken place in world potato markets. Production has shifted out of several historically leading potato growing regions and into emerging and developing countries. China is now the foremost potato-producing nation, growing twice as many tubers as India, the next largest producer. Trade has increased; doubling in volume and rising by four fold in terms of dollar value. Much of the growth in trade stems from movements of frozen potato products.

Table 1—U.S. vegetable industry at a glance, 2009-12

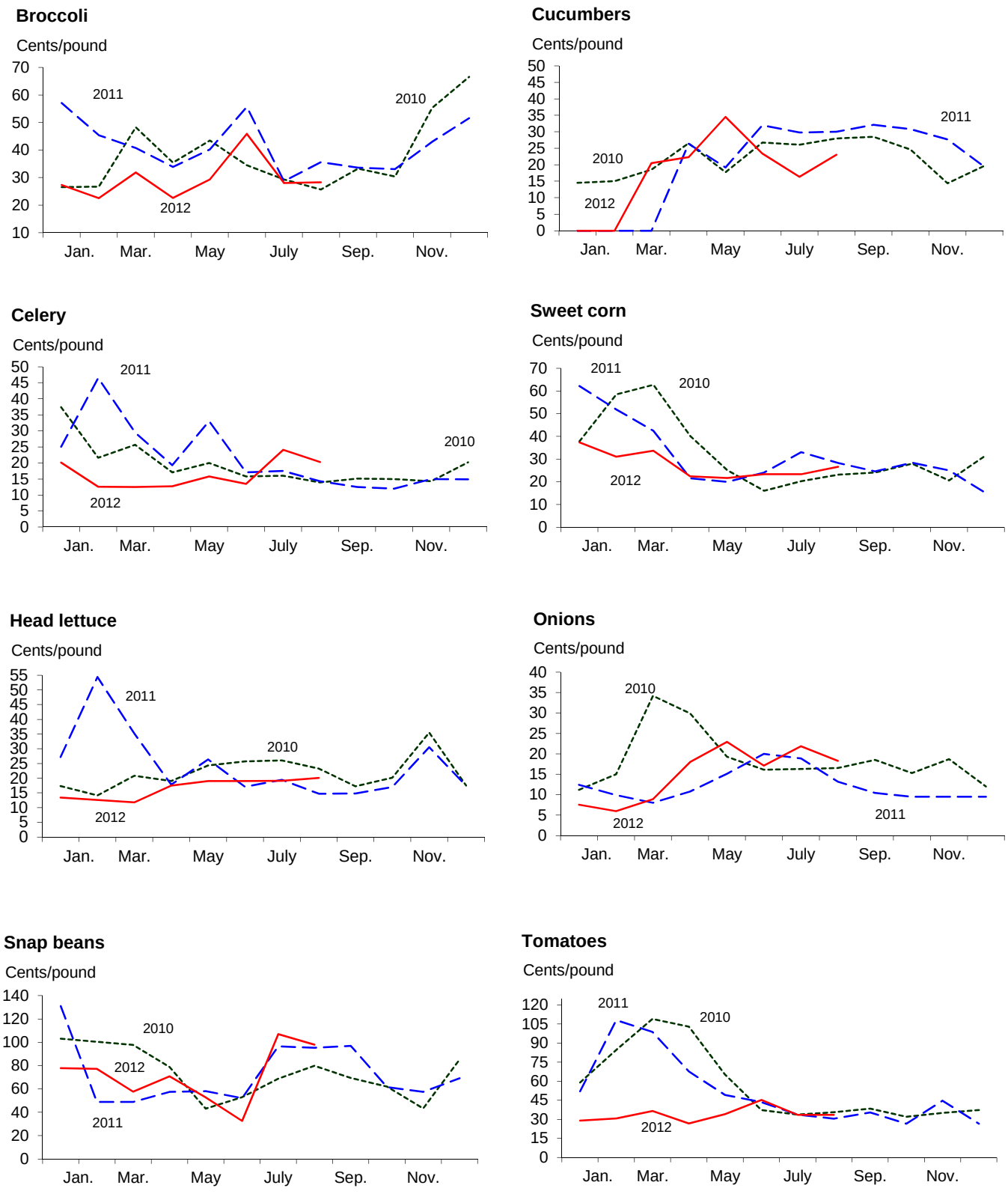
Item	Unit	2009	2010	2011	2012 1/
Area harvested	1,000 ac.	6,617	6,989	5,697	6,620
Vegetables:					
Fresh (excl melon)	1,000 ac.	1,487	1,486	1,489	1,481
Processing	1,000 ac.	1,264	1,170	1,076	1,100
Potatoes	1,000 ac.	1,044	1,008	1,077	1,134
Dry beans	1,000 ac.	1,464	1,843	1,156	1,674
Other 2/	1,000 ac.	1,358	1,483	899	1,231
Production	Mil. cwt	1,280	1,231	1,215	1,268
Vegetables:					
Fresh (excl melon)	Mil. cwt	379	386	378	380
Processing	Mil. cwt	391	352	340	345
Potatoes	Mil. cwt	433	404	430	459
Dry beans	Mil. cwt	25	32	20	27
Other 2/	Mil. cwt	52	56	47	57
Crop value	$ mil.	18,217	18,165	19,126	18,589
Vegetables:					
Fresh (excl melon)	$ mil.	10,009	10,066	10,763	9,343
Processing	$ mil.	2,141	1,698	1,800	1,863
Potatoes	$ mil.	3,558	3,722	4,006	4,428
Dry beans	$ mil.	790	899	827	1,016
Mushrooms	$ mil.	959	924	1,018	1,099
Other 2/	$ mil.	760	856	713	840
Unit value 3/	$/cwt	14.23	14.76	15.74	14.66
Vegetables:					
Fresh (excl melon)	$/cwt	26.38	26.05	28.44	24.60
Processing	$/cwt	5.48	4.82	5.29	5.40
Potatoes	$/cwt	8.22	9.21	9.32	9.65
Dry beans	$/cwt	31.08	28.27	45.32	37.60
Other 2/	$/cwt	33.06	31.78	36.83	34.02
Trade					
Imports	$ mil.	7,951	9,145	10,257	10,160
Vegetables:					
Fresh (excl melon)	$ mil.	4,061	5,052	5,570	5,095
Processing 4/	$ mil.	2,149	2,295	2,575	2,650
Potatoes & products	$ mil.	1,012	997	1,124	1,215
Dry beans	$ mil.	116	127	153	170
Other 5/	$ mil.	613	674	835	1,030
Exports	$ mil.	5,174	5,616	6,055	5,967
Vegetables:					
Fresh (excl melon)	$ mil.	1,682	1,900	1,960	1,600
Processing 4/	$ mil.	1,178	1,240	1,395	1,450
Potatoes & products	$ mil.	1,179	1,255	1,512	1,722
Dry beans	$ mil.	308	292	269	350
Other 5/	$ mil.	827	929	919	845
Per capita use	Pounds	403	405	390	396
Vegetables:					
Fresh (excl melon)	Pounds	141	144	143	143
Processing	Pounds	122	120	112	119
Potatoes & products	Pounds	123	123	118	114
Dry beans	Pounds	5	6	6	6
Other 2/	Pounds	12	12	11	14

1/ ERS forecasts. 2/ Includes sweet potatoes, dry peas, lentils, and mushrooms (except for crop value). 3/ Ratio of total value to total production. 4/ Includes canned, frozen, and dried. Excludes potatoes, pulses, and mushrooms. 5/ Other includes mushrooms, dry peas, lentils, sweet potatoes, and vegetable seed. All trade data are on a calendar-year basis.
Note: Cwt = hundredweight, 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. Dept. of Commerce, U.S. Census Bureau.

Figure 1

Point-of-first-sale (farm/grower) price* for fresh-market vegetables



Source: USDA, National Agricultural Statistics Service, *Agricultural Prices.*
* Price for August 2012 is preliminary.

Fresh-Market Vegetables

Downward Pressure on Price Eases

Lower volumes have relieved some of the downward pressure on fresh vegetable prices. Although most fresh vegetable prices at the point of first sale have rebounded from lows of early 2012, they are still well below prices in the 2nd quarter of 2011. Average April to June 2012 prices for broccoli, carrots, cauliflower, celery and field tomatoes are all at least 25 percent below the previous year. Still the 2nd quarter price index for all vegetables is over 30 percent higher than 1st quarter 2012 with only asparagus, celery, sweet corn, and snap bean grower prices below averages from earlier in this year.

There were reports of reduced summer plantings in response to low prices earlier in the year and July shipment volume of many fresh vegetables eased from highs of the previous month and earlier 2012. Overall volume was down 17 percent between June and July 2012. Based on prices reported to date for 3rd quarter 2012, projections are for a slow increase in the overall vegetable grower price index driven by relatively sharp price increases for some commodities (snap beans, celery) and more modest decreases in others.

Even with the realization of a hotter and drier summer than normal in 2012, for many vegetables summer volumes still remain above 2011 levels. Much of the fresh vegetable production is either irrigated and/or grown outside regions most affected by the extreme weather. In some cases warmer than normal weather has accelerated production of vegetable commodities.

New York reports harvest of sweet corn, beans, and tomatoes ahead of average and many other states are reporting good yields. July sweet corn shipments fell 62 percent compared with the previous month but remained almost 40 percent above shipments from July 2011. Shipment volume remains high in herbs, Chinese cabbage, chile peppers, and Roma tomatoes (field grown) where July 2012 totals were up over both the previous month and July 2011. As temperatures have begun to cool in September, conditions should improve for fall vegetables.

Table 2--U.S. quarterly fresh-market grower (point-of-first-sale) prices, 2011-12

	2011				2012			Change
Commodity	1Q	2Q	3Q	4Q	1Q	2Q	3Q *	2nd Q 1/
	---------- *Cents/pound* ----------							*Percent*
Asparagus	132.00	110.57	--	--	108.00	107.43	--	-2.8
Broccoli	47.77	43.27	32.63	42.60	27.23	32.60	30.86	-24.7
Carrots	41.10	42.03	28.00	26.60	26.47	27.50	25.36	-34.6
Cauliflower	49.43	50.90	33.00	46.95	34.13	34.23	29.50	-32.8
Celery	33.70	23.17	14.77	13.97	15.07	14.00	19.15	-39.6
Sweet corn	52.13	21.80	31.13	22.77	34.00	22.43	25.29	2.9
Cucumbers	--	25.87	28.13	25.97	20.50	26.73	22.61	3.3
Lettuce, head	38.93	20.43	16.30	21.63	12.60	18.50	20.38	-9.5
Onions, dry bulb	10.14	15.30	14.17	9.48	7.47	19.33	16.67	26.3
Snap beans	76.10	55.83	96.20	62.73	70.83	52.00	94.67	-6.9
Tomatoes, field	86.20	53.40	33.13	32.60	32.03	35.30	33.44	-33.9
All vegetables 2/	226	162	148	144	118	152	157	-6.2

-- = not available. * = USDA Economic Research Service forecast.
1/ Change in 2nd quarter 2012 over 2nd quarter 2011.
2/ Price index with base period of 1990-92 (the period when the index equaled 100).
Source: USDA, Economic Research Service based on data from USDA, National Agricultural Statistics Service, *Agricultural Prices*.

Table 3--Selected U.S. fresh-market vegetable shipments 1/

Item	Annual 2011	June 2012	July 2011	July 2012	Change previous: 2/ Month	Change previous: 2/ Year
	1,000 cwt				*Percent*	
Asparagus	3,465	295	292	288	-2	-1
Snap beans	3,087	213	87	109	-49	25
Broccoli	9,528	689	605	643	-7	6
Cabbage	11,219	362	538	465	28	-14
Chinese cabbage	1,176	72	65	76	6	17
Carrots	11,531	925	922	933	1	1
Cauliflower	4,213	357	322	327	-8	2
Celery	16,165	1,202	1,053	975	-19	-7
Sweet corn	12,747	3,197	892	1,227	-62	38
Cucumbers	16,437	1,402	966	1,232	-12	28
Greens	1,942	111	76	78	-30	3
Head lettuce	27,632	2,616	2,388	2,460	-6	3
Romaine	17,281	1,370	1,226	1,245	-9	2
Leaf lettuce	3,900	262	289	289	10	0
Herbs, misc.	1,829	122	116	134	10	16
Onions, dry bulb	56,903	4,064	4,219	3,763	-7	-11
Onions, green	3,032	296	190	249	-16	31
Peppers, bell	18,787	1,402	1,203	1,346	-4	12
Peppers, chile	7,610	482	433	573	19	32
Squash	8,475	394	312	255	-35	-18
Tomato, field, round	21,681	1,938	1,616	1,556	-20	-4
Tomato, field, Roma	7,536	340	257	349	3	36
Tomato, ghouse 3/	21,893	2,190	1,563	1,556	-29	0
Tomato, small 4/	3,911	211	286	249	18	-13
Selected total	239,835	24,512	19,916	20,377	-17	2

1/ 1,000 cwt = 100,000 lbs. Data for 2012 are preliminary and include domestic and partial imports.
2/ Change from July 2012. 3/ All tomatoes produced under cover. 4/ Grape and cherry tomatoes.
Source: USDA, Agricultural Marketing Service, *Fruit and Vegetable Market News.*

Onion Planted Area Declines

Consistent with the trend since the early 2000s, total U.S. planted onion acreage declined almost 4 percent between 2011 and 2012. The decrease was largest in plantings of spring onions. Despite a modest rebound in this category for 2011, the 2012 acreage was down almost 13 percent to less than 30,000. On average between 2000 and 2005, almost 40,000 acres had been planted to spring onions each year. Acreage planted in 2012 was down 27 percent in Texas and almost 7 percent in Georgia, but expanded slightly (3 percent) in California when compared with 2011.

Storage onion acreage expanded slightly in California for 2012 but remains below area planted prior to 2010. Acreage planted to storage onions in other states continues to decline. Although total acreage planted to storage onions across all states was down 1 percent in 2012, a higher proportion harvested resulted in approximately 1 percent increase in acres harvested when compared with the previous year. Across all spring and summer onion categories (storage and non-storage) harvested acreage decreased 3 percent in 2012.

July 2012 shipments of dry onions declined from the previous month and remains well-below the volumes of 2011. Third-quarter prices for dry bulb onions typically drop-off from spring levels. While 2012 NASS reported grower prices reflect this

Table 4--U.S. onions: Planted area by season, 2003-07 average and 2008-2012

Item	2003-2007 Average	2008	2009	2010	2011	2012	Chng 11/12
	1000 acres						*Percent*
Spring	38.0	31.2	29.9	28.4	33.1	28.9	-12.7
Summer							
Nonstorage 1/	21.7	20.1	17.9	19.1	19.3	19.1	-1.0
Storage							
California 2/	32.4	32.5	32.6	30.1	30.6	31.0	1.3
Other States	80.9	76.8	76.9	77.7	72.9	70.9	-2.8
Total storage	113.3	109.3	109.5	107.8	103.5	101.9	-1.6
Total summer	135.0	129.4	127.4	126.9	122.8	120.9	-1.5
U.S.	173.0	160.6	157.3	155.3	155.9	149.8	-3.9

-- = not available. p = preliminary. 1/ Nonstorage estimates for California began in 2000.
2/ Primarily dehydrated and other processing.
Source: USDA, National Agricultural Statistics Service, *Vegetables Summary.*

pattern with a 14-percent decrease from 2nd quarter 2012, prices remain well above (26 percent) prices from the 3rd quarter of 2011. The August 2012 Producer Price Index (PPI) for dry bulb onions reflects a similar 28-percent increase over August 2011.

Asparagus Production Down

U.S. asparagus production for the fresh market decreased again in 2012. Production levels ranged from 140 to 150 million pounds between 1999 and 2001, but reached a low of 62.6 million pounds in 2012. Increasing domestic use continues to be met by imports, primarily from Mexico and Peru. A decline in price per unit and high labor requirements are likely to keep downward pressure on domestic production.

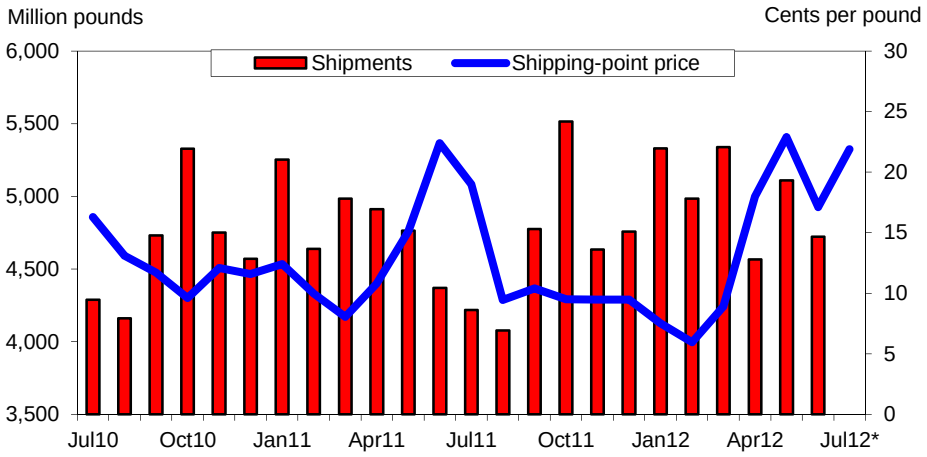
Retail Price Decreases

Just as they did when grower prices declined last winter, consumer prices lag the current upswing in grower prices. The Consumer Price Index (CPI) for fresh-market vegetables fell almost 2 percent between July and August 2012 as the Producer Price Index (PPI) increased 8 percent. The CPI for potatoes, tomatoes, and other vegetables continued to decline in August over July reports. Despite a month-over-month increase in CPI for lettuce, August 2012 saw the retail price index for tomatoes almost 5 percent below the previous year and the index for lettuce down 2.5 percent.

During the first 8 months of 2012, consumer prices for fresh vegetables were down for almost all commodities when compared to the same period in 2011 (based on average retail advertised prices). Price offerings for round field-grown, Roma (plum type), on-the-vine, and grape tomatoes remain 10 to 15 percent below the previous year. Advertised retail prices for lettuce were 7-9 percent lower while pepper, cucumber, and celery prices were down approximately 5 percent.

U.S. pumpkin production areas are reporting good crop progress for this year's Halloween season. With volume on track, average retail advertised prices for pumpkins in the early weeks of September 2012 have been running as much as 25 percent below the same period in 2011.

Figure 2
U.S. dry onions, all uses: Shipments and shipping-point price, 2010-12 1/



1/ Includes both imports and domestic product. July 2012 data is preliminary. Beginning January 2011, price reflects FOB shipping point basis. Prior months reflect delivered basis.
Source: USDA, Agricultural Marketing Service, *Market News* (shipments) and USDA, National Agricultural Statistics Service, *Agricultural Prices* (prices).

According to the USDA Agricultural Marketing Service's *Market News*, most advertised retail prices are beginning to rebound in September. Average advertised prices at major national retail supermarket outlets for selected vegetables during the initial 2 weeks of September 2012 (compared to August 2012) were as follows:

- asparagus rose 4 percent from August 2012 to $3.10/lb;
- green beans increased 7 percent to $1.44/lb;
- baby carrots increased 2 percent to $1.42/lb;
- broccoli fell 23 percent to $1.42/bunch;
- sweet corn rose 3 percent to 36 cents/ear;
- iceberg lettuce increased slightly (less than 1 percent) to $1.02/head;
- Romaine lettuce fell 12 percent to $1.06/each;
- sweet yellow onions rose 9 percent to $1.21/lb;
- green bell peppers increased slightly (less than 1 percent) to $1.36/lb;
- zucchini squash rose almost 7 percent to $1.29/lb;
- round field-grown tomatoes dropped 17 percent to $1.05/lb;
- Roma (plum-type) tomatoes increased 11 percent to $1.14/lb;
- hothouse tomatoes on the vine fell 2 percent to $1.61/lb.

Trade Volumes Increase

According to the U.S. Census Bureau, during the first 7 months of 2012, the volume of all fresh-market vegetable imports rose 5 percent over the same period a year earlier. On the export side, 2012 U.S. fresh vegetable export volume through July increased 3 percent, continuing a modest growth trend from the previous year.

Table 5--Fresh vegetables: consumer and producer price indexes 1/

Item	2011	2012			Change previous: 2/	
	Aug	Jun	Jul	Aug	Month	Year
	---------- *Index* ----------				---- *Percent* ----	
Consumer Price Indexes (1982/84=100)						
Food at home	228.4	231.5	231.3	231.7	0.2	1.4
Food away from home	232.5	237.8	238.3	239.1	0.3	2.8
Fresh vegetables	314.0	306.5	306.0	300.5	-1.8	-4.3
Potatoes	375.3	330.4	326.6	323.9	-0.8	-13.7
Tomatoes, all	301.8	303.9	303.8	289.3	-4.8	-4.1
Lettuce, all	290.3	276.7	277.5	283.1	2.0	-2.5
Other vegetables	308.9	312.1	312.2	305.5	-2.1	-1.1
Producer Price Indexes (Dec. 1991=100)						
Fresh vegetables (excl. potatoes) 3/	146.6	156.2	147.1	159.4	8.4	8.7
Beets	181.7	166.2	132.2	131.2	-0.8	-27.8
Cabbage 3/	243.1	196.8	199.7	227.3	13.8	-6.5
Carrots	195.9	182.4	202.3	193.3	-4.4	-1.3
Cauliflower	44.7	60.1	37.4	43.6	16.6	-2.5
Greens	200.9	163.1	161.9	147.2	-9.1	-26.7
Lettuce 3/	92.4	171.9	174.3	187.0	7.3	102.4
Onions, dry bulb 3/	158.9	141.7	172.5	203.0	17.7	27.8
Peppers, green	187.3	373.8	222.9	228.9	2.7	22.2
Spinach	440.1	365.9	195.8	295.9	51.1	-32.8
Squash	255.1	166.2	156.7	176.8	12.8	-30.7
Tomatoes 3/	153.2	148.1	138.2	156.0	12.9	1.8

1/ not seasonally adjusted. Data for 2012 are preliminary. 2/ Change in August 2012 from previous month/year.
3/ Index base is 1982=100.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Changes in trade volume varied substantially between commodities. Increased import volumes in cucumbers and peppers evident in the 1st quarter of 2012, continued through the 2nd quarter. From January through July, 2012 cucumber imports rose 12 percent and sweet pepper imports rose 23 percent. Imports of both asparagus and squash were up in the first 7 months of 2012.

Fresh asparagus imports from Mexico have increased 28 percent compared with the same period in 2011, to reach 201 million pounds in 2012. Import volume from Peru is down approximately 17 percent as acreage there has decreased. In addition more Peruvian asparagus is moving into the European markets. Approximately 3 million pounds of asparagus entered the United States from Canada between January and July 2012, approximately equivalent to 2011 and up 7 percent over 2009 volumes.

Mexico is also the largest supplier of fresh squash imports to the U.S. Volume from Mexico increased 11 percent in the first 7 months of 2012 compared with 2011, to reach 405 million pounds. Costa Rica (22.5 million pounds), Honduras (8.3 million pounds) Canada (3.5 million pounds) and Guatemala (3.2 million pounds) round out the top five suppliers to the U.S. market between January and July.

Fresh produce exports were mostly steady when compared with the previous year. An exception was fresh broccoli where levels rebounded from 2011 lows. An additional 21.8 million and 19.7 million pounds of broccoli were exported to Japan and Canada, respectively between January and July, 2012 when compared with the same period in 2011. Although still relatively small in absolute volume (approximately 628,500 pounds), exports of broccoli to South Korea were up substantially in percentage terms during the first 7 months of 2012.

Table 6--Selected fresh-market vegetable trade volume, 2010-12 1/

Item	2011 Annual	January - July 2010	January - July 2011	January - July 2012	Change 2011-12
	1,000 cwt				*Percent*
Exports, fresh:					
Onions, dry bulb	7,010	3,092	3,458	3,051	-12
Lettuce, other	4,637	2,409	2,677	2,807	5
Tomatoes	2,526	1,376	1,467	1,488	1
Lettuce, head	2,963	1,666	1,755	1,779	1
Broccoli	2,375	1,872	1,454	1,911	31
Carrots	2,387	1,729	1,701	1,726	2
Celery	2,608	1,622	1,605	1,742	9
Other	14,771	8,409	9,573	9,816	3
Total	39,276	22,174	23,690	24,321	3
Imports, fresh:					
Tomatoes, all	32,871	24,180	21,548	22,303	4
Cucumbers	13,098	8,625	8,488	9,536	12
Peppers, sweet	9,324	6,615	6,020	7,379	23
Onions, dry bulb	8,689	5,065	5,139	4,811	-6
Peppers, chile	7,859	3,603	3,830	4,075	6
Squash 2/	5,988	3,944	3,758	4,264	13
Asparagus, all	3,850	2,335	2,405	2,708	13
Other	30,815	17,001	18,059	17,799	-1
Total	112,494	71,368	69,248	72,875	5

1/ Excludes melons, potatoes, mushrooms, dry pulses, and sweet potatoes. 2/ Excludes chayote.
Source: USDA, Economic Research Service based on data from U.S. Department of Commerce, U.S. Census Bureau.

Table 7--Fresh-market vegetables: imports by country, 2010-12 1/

Item	2011 Annual	January - July 2010	January - July 2011	January - July 2012	Change 2011-12
	1,000 cwt				*Percent*
Mexico	86,174	58,796	56,156	59,985	7
Canada	12,351	5,797	5,538	5,730	3
China	1,724	977	856	943	10
Peru	3,870	909	1,070	1,011	-5
Others	8,375	4,889	5,629	5,205	-8
Total	112,494	71,368	69,248	72,875	5

1/ Excludes melons, potatoes, mushrooms, dry pulses, and sweet potatoes.
Source: USDA, Economic Research Service based on data from U.S. Department of Commerce, U.S. Census Bureau.

Processing Vegetables

Processing Contract Area Increases

Preliminary estimates are that production of four important processing vegetables will increase in 2012 compared to the low levels of 2011. U.S. growers of vegetables for processing have indicated they planted 955,600 acres under contract for tomatoes, sweet corn, snap beans, and green peas in 2012. That is 5 percent (43,000 acres) more than a year earlier. An increase in yield is anticipated resulting in projected total production under contract for the four commodities to increase 11 percent over 2011. In 2011, less than 1 percent of production for these four processing vegetables (primarily canning and freezing) was not grown under contract.

U.S. tomato processors have contracted for 13.5 million short tons in 2012—up 9 percent from a year earlier and a record-setting level if realized. Although production fell almost 3 percent in 2011 compared with 2010, average yields continued to rise to a record high 46.29 tons per acre. California tomato processors signed contracts for 12.9 million short tons of processing tomatoes in 2012—up 8 percent from the amount produced under contract a year ago. California typically produces 95 percent of the U.S. processing tomato crop.

Tomato contract acreage in 2012 increased 21 percent in Ohio, to reach 6,400 acres. Slight increases in contract acreage are reported in Indiana with slight decreases in Michigan. Driven primarily by expected improvements in yield, production outside of California is forecast to jump 32 percent to 0.6 million short tons led by a 49 percent gain in Ohio, followed by Indiana (33 percent) and Michigan (10 percent).

Contract acreage for green peas (freezing and canning) was reported to increase 15 percent in 2012 with 78,700 acres planted for canning peas and 108,000 acres planted for freezing peas. The largest gains in anticipated acreage harvested are in Minnesota, where production is expected to exceed 95,000 short tons. Despite planting less than half the acreage compared with Minnesota, high yields in Washington are anticipated to generate over 115,500 short tons.

Table 8--Selected vegetables for processing: Area harvested and production, United States and leading production state

Item	Contract area			Total production		
	2010	2011	2012p	2010	2011	2012p
	-------- *1,000 acres* ---------			-------- *1,000 short tons* ---------		
Tomatoes	288.9	266.8	276.9	12,691.3	12,355.2	13,501.8
California	268.0	249.0	258.0	12,212.0	11,900.0	12,900.0
Sweet corn	335.2	326.3	339.1	2,694.3	2,623.0	2,703.9
Minnesota	119.3	119.9	124.8	826.4	735.8	842.4
Snap beans	191.3	160.2	160.1	761.4	669.1	672.4
Wisconsin	77.8	68.7	71.2	308.8	299.4	309.0
Green peas	172.6	159.1	179.5	345.6	294.9	350.5
Washington	33.8	27.9	36.1	89.9	95.7	115.5

p = NASS preliminary

Source: USDA, National Agricultural Statistics Service, *Vegetables* and *Vegetable Summary*.

Contract area harvested of sweet corn for both canning and freezing is expected to increase 4 percent in 2012 over 2011. In prior years, approximately half the contract acreage has been destined for canning with the remainder destined for the freezing market with less than 1 percent of total production in both markets from noncontract growers. If expectations are realized, 2012 contract production would approach 2.7 million short tons.

Among the four commodities with contract acreage reported by USDA's National Agriculture Statistics Service, only snap beans are expected to have a decrease in contract area harvested in 2012 compared with the previous year. Despite the small reduction in area, total production will not necessarily decline. In fact, assuming anticipated yields are realized, total 2012 production of contract snap beans would increase slightly (less than 1 percent).

Frozen Stocks Continue To Rise

Stocks of frozen vegetables (excluding potatoes) in cold-storage warehouses on July 31, 2012 were up 7 percent from a year earlier. Low stock levels for lima bean and blackeye peas continue with stocks 51 and 29 percent below July 31, 2011, respectively. Small crops of lima beans for freezing were produced in 2011 and imports of lima beans remain modest. Other drawdowns were noted for okra (32 percent), Southern greens (19 percent) and green peas (12 percent). Stock levels were up significantly for snap beans (57 percent), broccoli (40 percent), cauliflower (36 percent), all onions (31 percent), and squash (37 percent) compared with levels in July of the previous year.

Table 9--Frozen vegetables: U.S. cold storage holdings, July 31

Commodity	2010	2011	2012 1/	Change from a year ago
	---------- *1,000 pounds* --------			*Percent*
Asparagus	11,723	9,065	10,933	21
Lima beans	30,926	31,091	15,310	-51
Snap beans	127,621	106,841	167,618	57
Broccoli	80,857	70,980	99,512	40
Brussels sprouts	12,309	9,575	9,912	4
Carrots	167,044	151,415	151,709	0
Cauliflower	19,321	16,276	22,210	36
Sweet corn, cut	291,404	181,404	193,490	7
Sweet corn, cob	100,184	89,845	86,971	-3
Mixed vegetables	43,172	44,580	43,563	-2
Okra	20,795	31,918	21,656	-32
Onions, all	23,805	56,913	74,285	31
Blackeye peas	2,094	2,374	1,691	-29
Green peas	456,725	440,127	386,176	-12
Southern greens	16,301	18,056	14,563	-19
Spinach	90,340	75,400	68,894	-9
Squash	45,632	43,865	59,927	37
Other vegetables	313,144	268,594	333,598	24
Total	1,853,397	1,648,319	1,762,018	7

1/ Preliminary.
Source: USDA, National Agricultural Statistics Service, *Cold Storage.*

Table 10--Processing vegetables: Consumer and producer price indexes 1/

Item	2011	2012			Change previous: 2/	
	Aug	June	July	Aug	Month	Year
	---------- *Index* ----------				---- *Percent* ----	
Consumer price indexes (1997=100)						
Processed fruits and vegetables	151.6	158.3	156.7	157.6	0.6	4.0
Canned vegetables	165.3	170.0	166.5	167.7	0.7	1.5
Frozen vegetables (1982-84=100)	198.8	212.8	211.6	210.7	-0.4	6.0
Dry beans, peas, lentils	174.1	201.8	200.1	201.8	0.8	15.9
Olives, pickles, relishes	139.2	134.4	134.3	137.5	2.4	-1.2
Producer price indexes (1982=100)						
Canned vegetables and juices	168.1	171.0	172.0	171.7	-0.2	2.1
Pickles and products	213.7	221.0	221.0	220.9	0.0	3.4
Tomato catsup and sauces 3/	152.9	153.5	154.3	148.8	-3.6	-2.7
Canned dry beans	157.4	159.5	159.5	164.4	3.1	4.4
Vegetable juices 3/	123.1	125.0	125.0	125.6	0.5	2.0
Frozen vegetables	185.1	197.7	194.4	194.1	-0.2	4.9
Dried/dehy. fruit & vegetables	203.5	208.5	208.2	208.2	0.0	2.3

1/ Not seasonally adjusted. 2/ Change in August 2012 from the previous month/year.
3/ Index base year is 1987.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Prices Steady for Processed Vegetable Products

List prices for many processed vegetable products remain steady from the first quarter of 2012. An exception is canned beets in the larger size cans (6/10) where wholesale (list) prices were reported to be averaging less than 2 percent over the 1st quarter 2012 price and 5 percent above the 2011 average.

Between July and August 2012, decreases of less than 0.5 percent were reported in the Producer Price Index (PPI) for canned vegetables and juices and frozen vegetables with no change reported for dried/dehydrated fruit and vegetables. Most prices remain slightly above those of the previous year. Compared to 2011, price increases are moderate (less than 2.5 percent) in dried and canned products and slightly more substantial (approximately 5 percent) for frozen vegetables.

Prices are also up at the consumer level. The Consumer Price Index (CPI) for frozen and canned vegetables were up approximately 6 and 1.5 percent, respectively, in August 2012 compared with August 2011. Consumer price levels for all processed fruits and vegetables rose 4 percent during the same period.

Processed Trade: Import and Export Value Up

Between January and July 2012, the value of all processed vegetable imports (excluding potatoes, pulses, and mushrooms) rose 6 percent compared with the same period in 2011. Mexico and China maintained their presence as the largest suppliers of processed vegetables to the United States with 25 and 16 percent shares in early 2012. India was the third largest supplier led by guar seeds, cucumbers and gherkins, and dried peppers. Across all processed vegetable commodities, India supplied 9 percent of import value between January and July 2012, followed closely by Canada (9 percent) and Peru (8 percent).

Imports of dehydrated products from all sources were up 16 percent from values reported in the first 7 months of 2011. China continues to supply almost 100 percent of U.S. imports of dried garlic, although the total volume has decreased every year

since 2008. The 2012 garlic crop in China is reported to be smaller than normal, with some estimates that the crop could be reduced as much as 30 percent.

U.S. imports of dried and dehydrated peppers continue to increase. When all peppers are considered, Mexico is the largest supplier followed by Peru and China. Volume from Peru and China rose in the first 7 months of 2012 compared to the previous year, while imports from Mexico were reduced by over 10 percent. When only sweet peppers are considered, India and China both supplied approximately 35 percent of U.S. imports between January and July, 2012. While Mexico remains the third largest supplier of dried and dehydrated sweet pepper to the United States (16 percent), volume of imports in the last 5 years (January to July) has doubled to 11.5 million pounds.

The value of processed-vegetable exports from the United States during January-July 2012 also totaled 6 percent above a year earlier. The top five destinations during this period include Canada (39 percent of the total), Japan (13 percent), Mexico (9 percent), Italy and South Korea (3 percent each).

The value of dehydrated-vegetable exports increased 10 percent through July. Canada remains the primary destination, accounting for almost one-fourth of U.S. exports in the category. Other important destination countries for the first 7 months of 2012 included Japan, Taiwan, Australia, Indonesia and the United Kingdom. Canned-vegetable export value also increased in the first 7 months of 2012, up 6 percent from the previous year. With a rebound in volume of tomato paste shipped, the value of all canned exports to Italy increased to 2010 levels of approximately $23.5 million; still about one-half the value prior to 2010 but well above the short $9 million realized in the first 7 months of 2011. The value of frozen-vegetable exports to all countries from the U.S. increased by a slightly more modest 5 percent over the same period.

Table 11--Value of processed vegetable trade 1/

Item	2011 Annual	January - July 2010	January - July 2011	January - July 2012	Change 2011-12
		Million dollars			*Percent*
Imports:					
Canned	1,150	581	639	621	-3
Tomato products	171	117	102	97	-5
Frozen	873	419	501	527	5
Broccoli	291	141	168	169	0
Dehydrated 2/	671	289	375	435	16
Peppers, all	266	119	148	172	16
Exports:					
Canned	944	483	534	565	6
Tomato products	606	301	351	348	-1
Frozen	269	130	153	161	5
Sweet corn	86	40	48	49	3
Dehydrated 2/	182	95	95	105	10
Onion products	82	48	47	45	-4

1/ Excludes potatoes and mushrooms. 2/ Also includes miscellaneous dried leguminous vegetables.
Source: USDA, Economic Research Service based on data of the U.S. Department of Commerce, U.S. Census Bureau.

Table 12--Value of processed vegetable imports by selected country 1/

Item	2011 Annual	January - July 2010	January - July 2011	January - July 2012	Change 2011-12
		Million dollars			*Percent*
Canned	1,150	581	639	621	-3
Mexico	207	124	123	119	-4
Peru	191	57	79	79	0
Canada	110	71	67	60	-10
China	108	50	59	62	6
Others	534	280	312	302	-3
Frozen	873	419	501	527	5
Mexico	408	202	245	248	1
Canada	141	73	79	82	3
China	86	44	50	48	-4
Guatemala	59	22	34	34	-1
Others	180	78	93	116	25
Dehydrated 2/	671	289	375	435	16
China	208	89	133	142	7
Peru	71	26	35	33	-4
Mexico	63	31	36	37	2
India	106	37	45	109	144
Others	223	106	126	113	-10

1/ Excludes potatoes and mushrooms. 2/ Also includes miscellaneous dried leguminous vegetables.
Source: USDA, Economic Research Service based on data of the U.S. Department of Commerce, U.S. Census Bureau.

Table 13--Value of processed vegetable exports by selected country 1/

Item	2011 Annual	January - July 2010	January - July 2011	January - July 2012	Change 2011-12
		Million dollars			*Percent*
Canned	944	483	534	565	6
Canada	405	200	223	240	8
Italy	27	23	9	24	153
Mexico	106	47	63	57	-9
Japan	69	40	42	54	30
Others	337	172	197	189	-4
Frozen	269	130	153	161	5
Canada	98	43	57	60	6
Japan	66	36	37	44	18
Hong Kong	12	8	7	6	-20
Mexico	23	10	13	11	-13
Others	71	33	39	40	2
Dehydrated 2/	182	95	95	105	10
Canada	41	24	23	24	5
Japan	23	12	12	11	-7
United Kingdom	7	7	5	6	18
Taiwan	22	8	6	9	51
Others	118	59	60	69	15

1/ Excludes potatoes and mushrooms. 2/ Also includes miscellaneous dried leguminous vegetables.
Source: USDA, Economic Research Service based on data of the U.S. Department of Commerce, U.S. Census Bureau.

Potatoes

Expanded Area To Boost Output in 2012

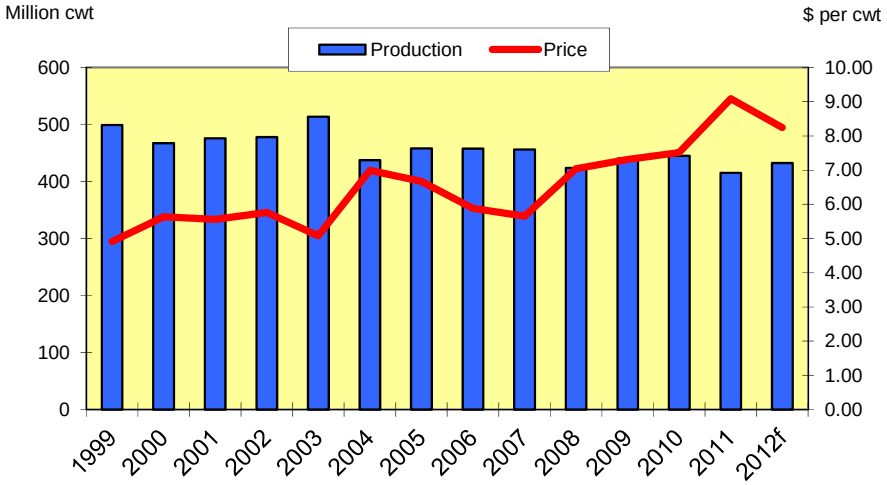
The potato crop in 2012 is expected to expand by close to 7 percent from 429.6 million cwt in 2011 to 459 million cwt. This growth is attributed to an expected 5.4-percent increase in harvested acreage and a 1.4-percent yield gain. Seventy-seven percent of the 29.4 million cwt additional production is from the fall crop, which is projected up 5.8 percent. While many of the potato areas were warm and dry in the spring dry this year, conditions were not as hot as other parts of the country.

Production in 2011 advanced by 6.3 percent, nearly offsetting the 6.5-percent drop in 2010. Of this output, most of the 2011 crop year sales were from processing potatoes, as table-stock use fell 4.4 percent. Demand for frozen potatoes was up 7 percent in 2011 as domestic and export demand expanded, returning to the 2009 level of 160 million cwt. Overall demand for chips and dehydrated potato products was up as well.

Based on crop year 2011 sales and the production estimate for 2012, total sales for crop year 2012 are expected up 6 percent (equal to the gain in 2011) — 6.5 percent for processing potatoes and 5 percent for table stock. The sales growth for fresh potatoes is largely due to domestic demand as year-to-date exports are down.

The value of total U.S. potato sales amounted to a record $3.74 billion for the 2011 crop, up 8.5 percent from 2010. Eighty-six percent of this sales gain is accounted for by processing potatoes. In terms of sales value per harvested acre, another record of $3,475 was set in 2011 nationally. Washington State farmers sold $4,520 of potatoes per acre on average, down slightly from 2010's level. Per acre, Idaho's sales were $3,038, more than twice the level in 2004.

Figure 3
Potato prices head down as production expands



Source: USDA, National Agricultural Statistics Service, *Potatoes 2011 Summary.*

Price Outlook Is Down for Fresh But not for Processed Potatoes

From January to July, potato prices are about $1.18 per cwt lower on average than in 2011. Fresh-market prices are down by around $2.75 per cwt thus far, whereas processing prices are slightly ahead by 22 cents. These changes are due in part to more shipments for fresh sales, which are up 7.5 percent to date.

Although shipments to processors are similarly up, seed shipments are down. If these price changes hold until December 2012, prices for fresh potatoes are projected to average $10 per cwt and processing potatoes will average $8.06 per cwt. Overall, potato prices in 2012 are expected to be around $8.23 per cwt nationally, about equal to 2009 prices. Producer prices for frozen fried potatoes and potato chips are estimated to be about 11 percent higher on average than in 2011.

The disposition of the 2011 crop shows a second year of a higher share for processing potato sales (66.7 percent) and a lower share for table stock (25.8 percent). The sales share for seed and feed use remains unchanged at 5.7 percent. The long-term trend for relative utilization is up for frozen fries and down for other frozen potatoes. The market shares for chips and starch/flour/meal are also on the rise relative to preserved and canned products, which are down.

Based on 2.6-percent more stocks from January to July compared to 2011, stocks of frozen potatoes are projected to be slightly larger in 2012. These products in cold storage are down thus far in the West Coast facilities but up in the rest of the country, especially in the East Coast. Public warehouses, which store about three-quarters of frozen potato products, have accommodated 4 percent more stocks through July.

Table 14--U.S. fresh potatoes: quarterly shipments

	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Year
			-- Million pounds --		
Domestic shipments					
2007	2,492	2,515	2,352	2,617	9,976
2008	2,535	2,484	2,235	2,459	9,713
2009	2,365	2,496	2,413	2,598	9,871
2010	2,494	2,511	2,377	2,530	9,912
2011	2,373	2,375	2,255	2,541	9,544
2012	2,389	2,426			
Change	0.7%	2.1%			
All fresh potatoes 1/					
2007	2,501	2,509	2,329	2,619	9,958
2008	2,546	2,483	2,213	2,472	9,714
2009	2,383	2,485	2,387	2,600	9,855
2010	2,499	2,497	2,350	2,523	9,868
2011	2,380	2,353	2,214	2,537	9,484
2012	2,393	2,356			
Change	0.5%	0.2%			

1/ Domestic shipments plus imports minus exports.
Sources: USDA, Agricultural Marketing Service (domestic shipments) and U.S. Department of Commerce, U.S. Census Bureau (imports).

Per Capita Use Is 5 Percent Lower in 2011

Domestic consumption of French-fried potatoes has been relatively flat at 44 pounds per capita since 2006. Per capita disappearance of other frozen potato products such as shoestring, chunks, hash, and mashed, on the other hand, has declined sharply from 8.5 pounds in 2007 to 4.2 pounds in 2011.

Including the gradual decline of per capita use of fresh potatoes, U.S. per capita use of all potato products appears to be trending down from 125 pounds in 2007 to 110 pounds in 2011. These developments stem from the incrementally smaller supply of potatoes as production has not kept pace with U.S. population growth. Additionally, export shipments have consistently topped 5 billion pounds since 2006, and reached 6.6 billion pounds in 2011, which helped reduce domestic consumption.

Using crop year prices, the U.S. supply of crop year 2011 potatoes totaled $4.9 billion in 2011, up almost 10 percent from 2010. After subtracting exports, total domestic use value was $3.4 billion, which is 5 percent higher than in 2010. The corresponding per capita use value (at wholesale prices) is $9.56, somewhat lower than 2008's record $9.92. Of this, the value of processing potatoes used was $5.55 in 2011 and $4 for fresh potatoes.

Trade Surplus Was Up 50 Percent in 2011

Total domestic potato shipments in 2012 are projected to be about 5 percent smaller than last year because of lower marketings of the 2011 crop. Both fresh-market and chipper potatoes are behind 2011's pace, but seed potatoes are 6 percent larger. One reason for higher seed demand is expanded exports to Canada and Mexico, the top two foreign markets.

Table 15--Utilization of U.S. potatoes: Share of total production sold

Uses	1990	1995	2000	2005	2010	2011
			-- *Percent* --			
Table stock	32.5	30.5	30.0	29.2	28.6	25.8
Processing	60.4	62.4	61.9	64.6	65.7	66.7
Frozen french fries	29.5	31.5	31.6	32.4	36.2	36.3
Other frozen	6.5	6.6	5.8	6.5	3.6	3.8
Chips	12.1	11.5	11.3	13.4	14.5	14.8
Dehydrated	10.6	11.0	11.7	11.1	9.1	11.4
Preserved	1.3	1.4	1.1	0.8	0.6	0.6
Starch and other	0.5	0.4	0.4	0.4	1.7	1.5
Other sales	7.1	7.1	8.1	6.2	5.7	5.7
Seed	6.3	6.3	5.0	5.7	5.5	5.5
Feed	0.9	0.8	3.1	0.5	0.2	0.2

Source: USDA, National Agricultural Statistics Service, *Potatoes 2011 Summary*.

While domestic demand for fresh and frozen potatoes is relatively weak due in part to the sluggish U.S. economy, exports of frozen potatoes, which are largely French fries, are booming. For the first time, U.S. export value for all frozen potatoes may top $1 billion in 2012, up from about $900 million in 2011. Frozen potatoes represent around 60 percent of total U.S. potato exports. Japan imports a third of these frozen products. The smaller markets for frozen potatoes are Canada, China, Mexico, and South Korea.

From 2000 to 2009, the United States was a net importer of potato products in volume terms. Starting in 2010, exports exceeded imports and have risen rapidly such that a trade surplus of 237 million pounds was posted in 2011 and about 596 million pounds are projected for 2012. Japan is the principal importer of U.S. frozen fried potatoes while Canada is the top market for fresh potatoes. Nevertheless, a trade deficit of $664 million worth of fresh and frozen potatoes is projected with respect to Canada in 2012, the largest since 1994. For potato chips and dehydrated potato products, Mexico and Canada are the chief suppliers.

Table 16--U.S. potato exports, 2008-2011

	January- December				Change
Markets	2008	2009	2010	2011	2011-10
	-- Million dollars --				*Percent*
Canada	284.1	281.4	309.0	375.9	21.6
Japan	302.2	339.8	342.2	348.9	2.0
Mexico	153.4	122.5	140.2	166.2	18.6
Others	456.7	435.1	463.6	622.1	34.2
World	1,196.4	1,178.8	1,254.9	1,513.1	20.6

Source: Economic Research Service based on the data of the U.S. Department of Commerce, Bureau of the Census.

Mushrooms

Sales Value and Volume Up

Driven by increased production and higher prices, the farm value of all mushroom (*Agaricus* and others) sales during the 2011/12 crop year (July-June) totaled a record $1.1 billion, up 8 percent from the previous year. Total U.S. mushroom sales volume increased 4 percent to an all-time high of 900 million pounds. This gain in sales was attributed to 3.8-percent increase in total area fillings and a record yield of 6.33 pounds per square foot of *Agaricus* mushrooms. *Agaricus* mushrooms account for 98 percent of all mushrooms produced in the United States.

Sales volume of *Agaricus* mushrooms (fresh and processed) rose 4 percent to 882 million pounds in 2011/12. A rise in volume was realized across *Agaricus* mushroom varieties. White button mushrooms, which accounted for 83 percent of all *Agaricus* sales, increased 4 percent to 736 million pounds, while brown mushrooms (including Portobello and Crimini) increased 7 percent to 146 million pounds. Similarly, sales value climbed up both for white and brown *Agaricus* mushrooms netting $1.04 billion.

By market segment, sales of fresh *Agaricus* mushrooms, which accounted for nearly 87 percent of all *Agaricus* sales volume, reached 771 million pounds in 2011/12. This was the second consecutive year of record sales in fresh-market volume. Although sales volume continued to rise for fresh-market *Agaricus* mushrooms, average prices still increased slightly to $1.24 per pound, up 2 cents from previous season and up 14cents from a decade ago.

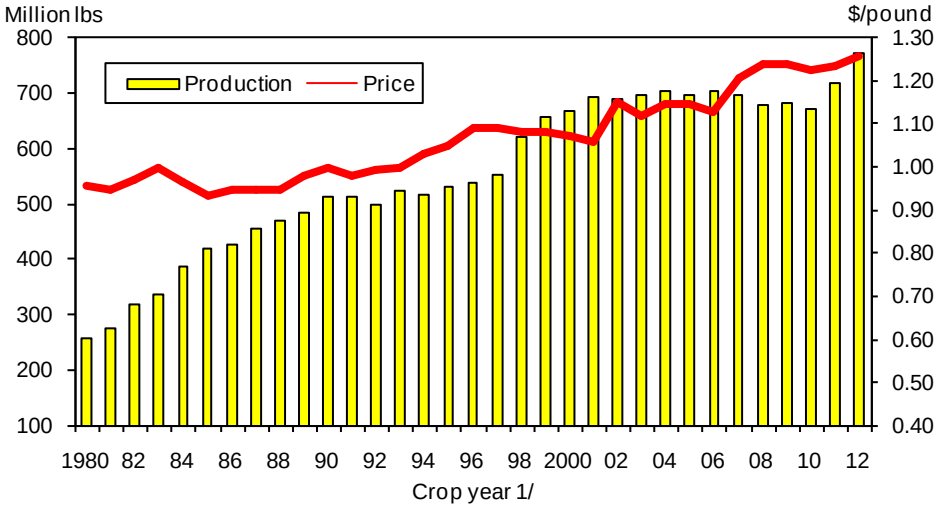
In the processing market, however, sales volume of *Agaricus* mushrooms dropped 13.4 percent from the previous year to 110 million pounds. This amount was slightly (3.1 percent) above the second lowest amount in 2009/2010.Meanwhile, the average price producers received for processing mushrooms jumped $0.63 per pound in 2011/12, up 4.8 percent from 2010/11.

Table 17--U.S. Mushrooms: Sales, price, and value

State	Volume of sales		Price		Value of sales	
	2010/11	2011/12	2010/11	2011/12	2010/11	2011/12
	1,000 pounds		*Dollars per pound*		*1,000 dollars*	
Agaricus	845,951	881,857	1.14	1.18	964,192	1,039,159
White	708,712	735,694	1.09	0.29	771,496	212,630
Brown 1/	137,239	146,163	1.40	5.65	192,696	826,529
All specialty	17,811	18,071	3.01	3.32	53,692	59,937
Shiitake	7,327	7,986	3.10	3.41	22,735	27,264
Oyster	7,742	7,005	2.37	2.55	18,387	17,876
Other	2,742	3,080	4.58	4.80	12,570	14,797
Total	863,762	899,928	1.18	1.22	1,017,884	1,099,096

1/ Includes Portobello and Crimini.
Source: USDA, National Agricultural Statistics Service, *Mushrooms.*

Figure 4
U.S. fresh-market *Agaricus* mushrooms: Sales volume and producer price



1/ Crop year (July-June) ends with year listed (e.g., 1980 = 1979/80).
Source: USDA, National Agricultural Statistics Service, *Mushrooms.*

Specialty mushrooms (excluding brown *Agaricus*) also increased in production volume during 2011/12, thus totaling18 million pounds. Unlike *Agaricus* mushrooms, which are sold both in the fresh and processing markets, most specialty mushrooms are sold only in the fresh market. In the same period, oyster mushrooms faced a 10-percent decline in sales volume, from the record high level of 7.8 million pounds in 2010/11 to 7 million pounds in 2011/12. Growers received higher average prices for all varieties—$3.41 per pound for shiitake, $2.55 per pound for oyster, and $4.80 for other mushrooms. Despite only a 1-percent of overall increase in sales volume, these higher prices contributed to the record-level value of sales that totaled $60 million in 2011/12.

Another segment with an upward trend in production and sales is certified organic mushrooms. Growers in this sector produced 32.2 million pounds of certified organic mushrooms in 2011/12, up 3.2 percent from previous crop year, but 27 percent less than the record high of 41 million pounds in 2008/09. Of this total amount, 19.7 million pounds or 61 percent were sold with the certified organic label, while the remainder were sold without it. *Agaricus* mushrooms accounted for 68 percent of certified organic sales, while all specialty mushrooms made up the rest. Certified organic mushrooms represented 3.6 percent of all mushrooms production volume in 2011/12.

Per Capita Use Increases

During the season 2011/12, in line with higher production, per capita disappearance (use) of all mushrooms rose 4.4 percent to 3.99 pounds. Fresh-market mushrooms use increased 6.5 percent to 2.75 pounds person while mushrooms for processing use declined 0.5 percent to 1.24 pounds per person.

Commodity Highlight: Chickpeas

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Ancient Origins to American Diets

The chickpea, also known as garbanzo bean, is a legume that has been domesticated in Turkey since at least 3500 B.C. Wild chickpeas carbon dated to 6800 B.C. have been found in Southern France. The plant grows between 8 to 20 inches high and has small feathery leaves on either side of the stem. Chickpeas are a type of pulse, with one seedpod containing 2 or 3 peas. They ideally need a subtropical or tropical climate with more than 16 inches of annual rain but can also be grown in a temperate climate.

Since the 1980s most of U.S. chickpea acreage has been planted in Washington and Idaho. Other production areas are in California, Montana, Oregon, North and South Dakota. Although California is the distant third major producer after Washington and Idaho, yield per acre in California is twice as high as yields in other States as a group. Seeds are planted in early to mid-April and harvest is typically in August. Thus the marketing year for chickpeas is from September to August. In the United States, chickpeas mature later than dry peas or lentils and prefer a longer, warmer growing season. The chickpea has deeper taproots than peas and lentils, giving it more drought tolerance.

Most domestic pulse crop production, including chickpeas, is marketed through processors, with about 20 percent of production contracted and the majority (80 percent) sold on the spot market. Chickpeas are marketed as a dry pulse crop or as a green vegetable, with the former being more common in the United States. Primary uses are in salad bars, hummus, and as canned vegetables which are included in salads, soups, or stews, especially in ethnic dishes. Chickpeas can also be pickled or ground as flour for baking. As livestock feed in secondary markets, chickpeas are a substitute for higher-cost protein crops.

U.S. Hummus Sales

The major use of chickpeas in the United States is processing (crushing) into hummus. According to the Symphony IRI Group, hummus sales were up more than 18 percent from 2009 to 2010. Hummus dominates the refrigerated spreads category, which had more than $325 million in annual sales in 2010. Hummus consumption increased 35 percent from 2008 to 2010. In 2006, hummus was

Table 18--Chickpea production by major State 1/

State	2007	2008	2009	2010	2011
	---------- *1000 cwt* ----------				
California	114	116	284	271	207
Idaho	432	362	415	658	774
North Dakota	248	119	194	250	47
Washington	540	466	500	611	935
Other States 2/	181	55	51	149	180
United States	1,515	1,118	1,444	1,939	2,143

1/ Includes small and large chickpeas (garbanzo beans).

2/ Montana, Oregon, and South Dakota.

Source: USDA, National Agricultural Statistics Service, *Crop Production.*

consumed by 12 percent of American households, rising to 17 percent in early 2009. Most U.S. hummus production facilities are located on the East Coast (The Seattle Times, July 24, 2012).

Varieties and Grading Standards

The two commercial varieties of chickpeas are Desi and Kabuli. Desi are smaller, darker seeds and have a rougher coat. In the United States, they are usually ground into flour. Kabuli is a larger, lighter colored bean with a smoother coat. Kabulis are largely mashed into hummus or canned. U.S. production of Kabuli is much larger than Desi. Domestic use or consumption of large chickpeas is generally three times that of small chickpeas, although the latter has grown rapidly in recent years. Like dry edible beans, chickpeas can be safely stored for 3 to 4 years. However, poor storage conditions or extended duration can result in color loss, moisture absorption, and desorption (Pulse Canada).

Strict sampling standards ensure proper grading of the product. After harvest, all pulses are sampled first for insect infestation and not sampled for other factors if sufficient evidence of infestation is found. USDA inspects chickpeas for splits, color, size, and foreign material before grading. U.S. grading standards are based on assessment of insect infestation, color, odor, moisture content, and standardization in size. If green seed content is less than 0.5 percent, the crop receives U.S. No. 1 grade. Crops are later tested for pesticide and fungicide residue and are not allowed to exceed set limits.

A Global Food and Rotation Crop

World chickpea production is roughly three times that of lentils, and world consumption is second only to dry beans among pulse crops marketed as human food (Food and Agriculture Organization). Much of the world's chickpea supply comes from India. The Desi is the most common chickpea produced in India. Other major producers of chickpeas include Canada, Australia, Pakistan, Iran, Mexico, and Turkey. World production is about 85 percent Desi and 15 percent Kabuli. In 2012, U.S. production of Kabuli ranks below Turkey, India, and Canada.

Chickpeas can be used to add diversity to grain crops, such as a replacement for summer fallow in continuous cropping systems. This provides an opportunity to break a number of pest life cycles associated with grain crops, including grassy weeds, diseases, and insect pests. In this role, chickpeas are planted the year following a full-season summer crop, such as corn, and are harvested typically in mid-August, then allowing 2 to 6 weeks for replenishment of surface soil moisture prior to winter wheat seeding. Chickpeas work well in rotation with winter wheat and warm-season grains such as millet and corn. The recommended crop rotation for chickpeas is once every four years. If properly inoculated, chickpea will fix its own nitrogen, although phosphorus is required for chickpea development and nitrogen fixation. Sulfur fertilization can also be helpful in sandy soils low in organic matter (University of Wyoming Bulletin B1153).

Cost of Production and Marketing Loan Rate

The estimated cash cost for the production of dryland chickpeas in the United States can exceed $180 per acre in 2003, including costs for inputs, machinery use, labor, management and land. For irrigated chickpeas, the total economic input cost can total more than $300 per acre (University of Wyoming Bulletin B1153). The 2002

Farm Bill added small chickpeas to the group of commodities eligible for marketing loans, which serve as a price support for domestic chickpea production when market prices are below the designated loan rate; large chickpeas were added under the 2008 Farm Bill. The 2012 marketing loan rate for Kabulis is $11.28 per cwt and $7.43 is applicable for Desi-type chickpeas, both of which are far below current market prices. Most recent market price averages of $45.75 per cwt for large chickpeas and $24.75 for small chickpeas are far above the loan rates.

Market Situation and Outlook

In the United States, a record 196,900 acres were planted with chickpeas in 2012, of which about two-thirds are large chickpeas. This represents a 48-percent expansion from 2011 as average marketing-year prices hit a high of $36 per cwt last year. The USDA weighted price projection for marketing year 2012/13 is even higher at $40 per cwt, even as total chickpea production expands and is expected to reach a record 2.7 million cwt, up 26 percent from the previous year.

According to USDA's Agricultural Marketing Service, grower prices in the first half of the 2011/12 marketing year have been higher than the previous year, but since mid-2012, bid prices received by growers for all chickpeas have been lower. Bid prices received by dealers have also been below 2011 prices since March. For the 2012/13 marketing year, the USDA's August 2012 projected price for small chickpeas is $24.75 per cwt, up 5 percent from 2011/12. For large chickpeas, the projected price is estimated at $45.75 per cwt, or 17 percent higher than 2011/12.

Not only is higher production expected in 2012, beginning stocks are also at a high level of about 106 million pounds. Projecting 2012 imports at 47 million pounds, total U.S. supply amounts to an estimated 393 million pounds of chickpeas in 2012, up 8 percent from 2011. Despite projected exports of a record 157 million pounds, total domestic use of chickpeas is expected to reach a record high of 131 million pounds in 2012. This translates into a half-pound per capita use rate, or 0.1 pound more than the level in 2011.

Crop production value is projected to reach approximately $108 million in 2012 compared to $77 million in 2011. More than $90 million of farm sales are expected

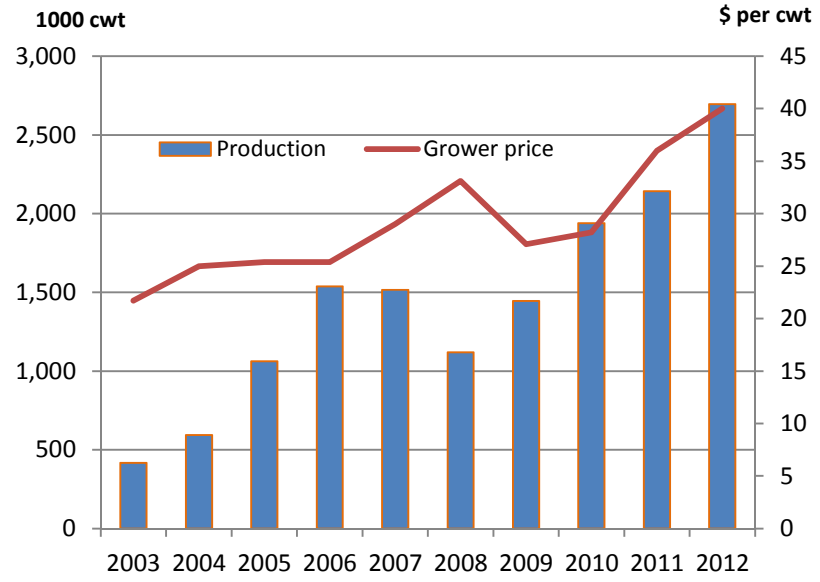
Table 19--Chickpea mid-range bid prices in Idaho/Washington

	Grower bid price			Dealer bid price		
Marketing year:	2010/11	2011/12	2012/13	2010/11	2011/12	2012/13
	-- *Dollars per cwt* --					
September	28.00	49.00	42.50	39.63	66.00	57.00
October	29.25	49.00		41.09	65.75	
November	31.00	47.75		41.90	62.00	
December	31.50	46.17		42.00	61.00	
January	31.88	46.67		43.75	58.50	
February	33.13	46.50		47.25	54.50	
March	35.30	41.00		51.00	49.92	
April	37.75	40.13		55.13	53.88	
May	40.50	40.90		59.50	57.00	
June	41.70	41.00		61.90	57.63	
July	42.50	41.00		63.50	57.70	
August	44.20	40.84		- - -	57.50	

- - - = Not available.

Source: USDA, Agricultural Marketing Service, *Bean Market News*.

Figure 5--Chickpea production increases as price rises



Source: USDA National Agricultural Statistics Service

to come from large chickpeas and $18 million from small chickpeas. 2012 crop value for all chickpeas is estimated at $555 per acre, which is only lower than $583 per acre in 2011. Indeed, the estimated crop value per acre for only large chickpeas was $695 in 2011, a historical high with respect to all varieties of dry peas and lentils grown in the United States.

Average monthly price received by chickpea growers between the September 2011 and August 2012 ranged from a low of $33.50 in October 2011 to a record high of $45.80 per cwt in April 2012. For large chickpeas, the high price thus far is $48.10 per cwt in July 2012. August to December are the months of peak marketings and February to June have the lowest monthly sales.

Since 2009, as domestic per capita use declined, U.S. export shipments of chickpeas have increased sharply. The export share of supply for U.S. chickpeas is expected to be a record 37 percent in 2012 (or 58 percent relative to production), rising from 12 percent in 2009. The top overseas markets for chickpeas are Spain, followed by Canada, Italy, and India. These countries accounted for 60 percent of shipment volume in 2011 when it reached a record 141 pounds, valued at $44.5 million. Spain is also the principal market for chickpeas used as seeds for sowing or planting.

Lower export unit values from September 2011 to August 2012 have raised corresponding export volumes more than export value. Export unit value of 31 cents per pound in the 2011/12 marketing year is 4 cents lower than in 2010/11. Chickpea shipment volume to foreign markets is projected to increase 40 percent in 2011/12 compared to 23 percent with respect to export value.

Since calendar year 1999, U.S. chickpea exports have generally exceeded imports in volume, except in 2004. Before 1999, U.S. imports of chickpeas have mostly been larger than exports. The United States imports chickpeas largely from Canada and in decreasing volume from Mexico. The import share of domestic use is anticipated at 29 percent in 2012, a relatively low level over the past two decades.

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A Dietary Assessment of Vegetable Consumption

Hodan Farah Wells[1]

Vegetables make important contributions to the American diet. Vegetables are a good source of many nutrients, such as dietary fibers, vitamins, and minerals. Vegetables also lower the risks of many chronic illnesses and in some cases protect against certain types of cancer (DGA, 2010). The average American diet falls short of the daily recommendations for vegetables, but Americans are now consuming more vegetables than in 1970.

[1]Hodan Farah Wells is an economist with Crops Branch, Market and Trade Economics Division, Economic Research Service

Many factors influence what people eat, including changes in food prices and income levels; availability of food through domestic production and trade; product convenience; exposure to new cuisines; and evolving dietary guidelines. In an effort to improve the daily food choices and reduce diet-related chronic diseases, the U.S. Department of Agriculture and the U.S. Department of Health and Human Services jointly publish the *Dietary Guidelines for Americans*. Since 1980, the *Guidelines* have targeted dietary recommendations based on the most current scientific evidence for Americans over the age of two. Core dietary messages are consistent, even as subsequent editions change slightly to reflect the latest scientific and medical information on nutrition and health. The 2010 *Dietary Guidelines for Americans* stress the importance of increasing the amount and variety of fruit and vegetable intake as one component of healthy eating. In particular, the *Guidelines* stress increasing consumption of dark-green vegetables, orange and red vegetables, and legumes.

This article updates the vegetable section of an earlier ERS report (Wells and Buzby, 2008) by: (1) examining the amount and variety of vegetables available for consumption in the United States between 1970 and 2010; and (2) comparing the amount of vegetables consumed by the average American in 2010 with the amount recommended in USDA's Food Patterns, as listed in Appendix 7 of the 2010 *Dietary Guidelines for Americans*.

Vegetables Available for Consumption

Over the past four decades, the total amount of vegetables (fresh and processed in fresh-equivalent weight) available for consumption in the U.S. food supply grew 17 percent, from 336.0 pounds per person in 1970 to 393.1 pounds per person in 2010, according to the Economic Research Service Food Availability Data System (see box, "ERS Food Availability (Per Capita) Data System"). The data measures supplies of commodities moving through production and trade channels for domestic use. It does not directly measure what individuals eat, but rather serves as an indicator of consumption trends over time. Used in this manner, the data provides an upper bound on actual consumption.

Much of the 17 percent (56.2 pounds) increase came from availability of fresh and frozen vegetables. Between 1970 and 2010, fresh and frozen vegetables in the U.S. food supply rose 21 percent and 61 percent, respectively. Legumes (i.e. pulses) also increased 16 percent, from 7.6 pounds per person in 1970 to 8.9 pounds per person in 2010. Meanwhile, the availability of canned and dehydrated vegetables and potatoes for chips dropped 3 percent, from 131 pounds per person in 1970 to 126.9 pounds per person in 2010.

Table 20— Per capita availability of vegetables, 1970 and 2010

Item	Per capita availability 1/ 1970	2010	Change, 1970 to 2010	2010 Loss-adjusted food availability 2/
	Pounds, fresh-weight equivalent		*Percent*	*Cups/day*
Vegetables by market category:				
Fresh vegetables	154.5	187.1	21	0.90
Processed vegetables	182.3	206.0	13	0.76
Canned	100.4	99.1	-1	0.25
Frozen	43.7	70.2	61	0.17
Dehydrated	13.2	12.7	-3	0.08
Potato chips	17.4	15.0	-14	0.14
Legumes	7.6	8.9	16	0.12
Vegetables by *Guidelines'* subgroups: 3/				
Dark-green vegetables 4/	3.9	23.3	501	0.22
Escarole, romaine, and leaf lettuces	0.6	11.0	1874	0.08
Broccoli	1.5	8.0	437	0.04
Red and orange vegetables 4/	89.0	112.5	26	0.30
Tomatoes	74.3	91.9	24	0.20
Carrots	9.3	9.8	5	0.06
Legumes	7.6	8.9	16	0.12
Dry edible beans	6.9	7.1	3	0.10
Dry peas and lentils	0.7	1.8	139	0.02
Starchy vegetables 4/	155.4	139.6	-10	0.55
Potatoes	121.7	111.9	-8	0.50
Corn	27.8	24.6	-11	0.05
Other vegetables 4/	80.9	108.8	34	0.48
Onions	10.1	21.4	111	0.07
Head lettuce	22.4	16.1	-28	0.10
Total vegetables	336.9	393.1	17	1.67

1/ Aggregate data, unadjusted for cooking losses, plate waste, and other losses.
2/ Adjusted for cooking losses, plate waste, and other losses. USDA's *MyPyramid Equivalents Database (MPED)* defines 1 cup of raw or cooked vegetables or vegetable juice, or 2 cups of raw leafy greens as a 1 cup-equivalent of vegetable.
3/ Includes fresh and processed vegetables.
4/ Includes food item(s) not shown separately.
Source: USDA, Economic Research Service.

Onions, tomatoes, bell peppers, broccoli, and cucumbers all contributed to the growth in availability of fresh vegetables. Dark-green and leafy products like collard greens, kale, mustard greens, and romaine lettuce, which were tracked later in the data series (starting in 1985 for romaine lettuce and mid-1990s for the rest) also trended upward. Popular and convenient products like ready-to-eat packaged salad greens contributed to their increase. In particular, availability of romaine lettuce more than tripled between 1985 and 2010, from 3.3 to 10.7 pounds per person. Meanwhile, the availability of potatoes, head lettuce, cabbage, and celery, among others, dropped between 1970 and 2010.

In terms of share, potatoes, tomatoes, onions, and head lettuce (out of the 32 commodities covered in the fresh vegetable data series) accounted for a 50-percent share of fresh vegetables available for consumption in 2010, down from 69 percent in 1970's. Fresh potatoes, which still account for the largest share in fresh vegetables, declined sharply during this period (from 40 percent to 19 percent). Shares of head lettuce also dropped from 14 percent in 1970 to 9 percent in 2010

while shares of tomatoes and onions continued to rise. Other vegetables' share, such as bell peppers, cucumbers, broccoli, moved up in the rankings during this period. For instance, the share of bell peppers increased from 1 percent in 1970 to 5 percent in 2010.

Frozen vegetable availability increased 61 percent, from 43.7 pounds per person in 1970 to 70.2 pounds per person in 2010. Potatoes were the primary driver behind this rise in vegetables for freezing, followed by sweet corn, broccoli, and snap beans. In contrast, the availability of asparagus, cauliflower, green peas, lima beans, and spinach dropped 26 percent, from 4.1 pounds per person in 1970 to 3.1 pounds per person in 2010.

In terms of share, the bulk of frozen vegetables came from frozen potatoes. For example, out of the 11 items covered under the frozen vegetable category, frozen potatoes' share accounted for 70 percent in 2010, up from 1970's share of 65 percent. Other frozen vegetables' share, such as broccoli and miscellaneous vegetables rose this period while the rest of the items moved down in the rankings.

Dietary Assessment of Vegetables

Per capita availability of vegetables in the U.S. food supply has increased since 1970. But how does this upward trend compare with recommendations in the 2010 *Dietary Guidelines*? According to Loss-Adjusted Food Availability data, the average American consumed 1.7 cups of vegetables (including legumes) per day in 2010. The Loss-Adjusted Food Availability data adjusts the Food Availability data for losses from farm-to-fork and then converts volume in pounds-per-year into cup-equivalents per day. While 1.7 cups of vegetables and legumes per day is 11 percent above the 1970's amount of 1.5 cups, it is still well below the current *Guidelines* recommendation of 2.5 cups per person based on a 2,000-calorie-per-day diet.[2]

The *Guidelines* also encourage choosing a variety of types of vegetables, since some vegetables are higher in certain vitamins and minerals than others. With this in mind, current recommendations are that consumers select from five vegetable subgroups several times per week in order to optimize nutrient intake.[3] 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). Of the five subgroups, Americans on average have met the recommended amount for dark-green vegetables since 2003. For other and starchy vegetables, 3.3 cups and 3.9 cups were consumed per week respectively. Consumption of red and orange vegetables (2.1 cups) and legumes (0.85) were furthest from recommended guideline levels.

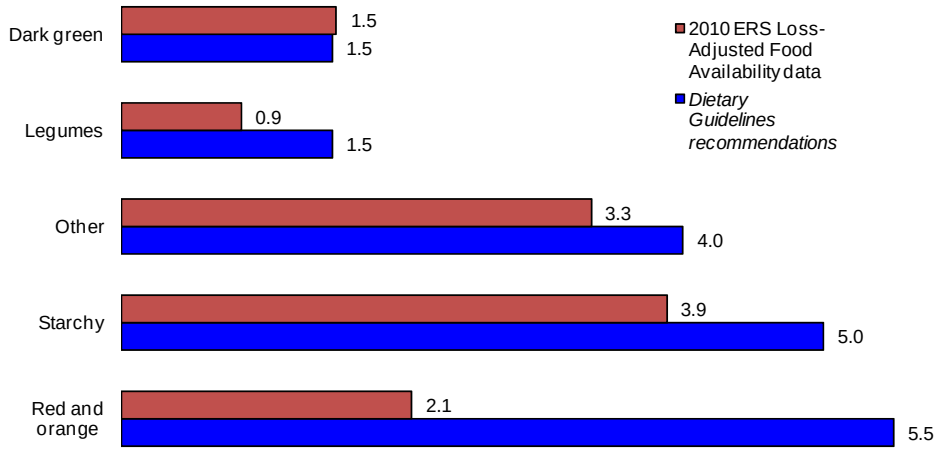
Although Americans have, on average, increased their overall consumption of vegetables and have, to some extent, increased their variety of intake, they are still short of the current *Dietary Guidelines*. Intake would need to increase by 50 percent (0.83 cup per person per day) in order to meet the current requirement. In terms of variety, Americans would need to substantially increase their consumption of red and orange vegetables by 166 percent, legumes by 76 percent, starchy vegetables by 29 percent, and other vegetables by 20 percent.

[2]The 2010 *Dietary Guidelines for Americans* break down daily recommendations into 12 calorie levels ranging from 1,000 to 3,200 calories per day. In this article, the 2,000-calorie-per-day reference level is used for consistency with the 2008 Wells and Buzby report.

[3]There were two major changes with regard to vegetables in the 2010 *Dietary Guidelines for Americans*. First, tomatoes and red peppers were moved from the "other vegetables" subgroup to a new subgroup: "red and orange vegetables." In this analysis, red peppers are included under the "other vegetables" subgroup, since peppers are not separated in the Food Availability Data System. Second, the amount recommended within subgroups changed from the 2005 edition. In 2005 recommendations were 3 cups per week of dark-green vegetables, 2 cups of orange vegetables, 3 cups of legumes, 3 cups of starchy vegetables, and 6.5 cups of other vegetables. Therefore, the 2005 edition is not directly comparable to the 2010 edition when comparing vegetable subgroups.

Figure 6
2010 Loss-Adjusted Food Availability data compared with 2010 *Dietary Guidelines* recommendations for a 2,000-calorie diet

Cup-equivalents per capita per week



Note: Other vegetables for example include artichokes, asparagus, snap beans, broccoli, etc.
Source: USDA, Economic Research Service.

ERS Food Availability (Per Capita) Data System

The ERS Food Availability (Per Capita) Data System consists of three data series—the Food Availability data, the Loss-Adjusted Food Availability data, and the Nutrient Availability data. The system provides unique and detailed estimates for the amount of food and nutrients available for human consumption in the United States.

The first series, the Food Availability data, is a commonly used proxy for food intake and its components are collected directly from producers and distributors using techniques that vary by commodity. In general, the data are calculated as the sum of annual production, beginning stocks, and imports minus exports, ending stocks, and non-food uses. Results depict the amount of food available for human consumption on an annual basis and are the only source of time-series data on food availability in the country. Although the Food Availability data series does not directly measure actual consumption or quantities ingested, it provides an indication of whether Americans, on average, are consuming more or less of various foods over time.

The second series, the Loss-Adjusted Food Availability data (derived from Food Availability data) subtracts the estimated amount of food lost due to spoilage and other losses at three stages in the marketing system (farm, retail, and consumer level). The loss-adjusted data are converted from pounds per capita per year into daily per capita food intake in two forms— *food pattern equivalents* and calories per person per day. For each food supply commodity, a *food pattern equivalent* was defined, with size based on USDA's *MyPyramid Equivalents Database (MPED)* and weight based on USDA's Nutrient Database for Standard Reference (NDB). *Food pattern equivalent* weights for individual commodities are aggregated to total daily amounts for the five major USDA food groups, plus the amounts for added sugars and sweeteners and for added fats and oils. Aggregated amounts for each food group are then compared with the amount recommended in

the USDA's Food Patterns, as listed in Appendix 7 of the 2010 *Dietary Guidelines for Americans*.

The third series, the Nutrient Availability data, is compiled by the USDA's Center for Nutrition Policy and Promotion (CNPP) using the Food Availability data to calculate the nutrient content of the U.S. food supply. This historical data series estimates the amounts per capita per day of food energy (calories) and 27 nutrients and dietary components (i.e. protein, carbohydrates, fats, vitamins, and minerals) in the nation's food supply.

The discussion in this article is drawn from the ERS Loss-Adjusted Food Availability Data (http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system.aspx), August 2012.

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Trends in Global Potato Markets

Jennifer Bond[1]

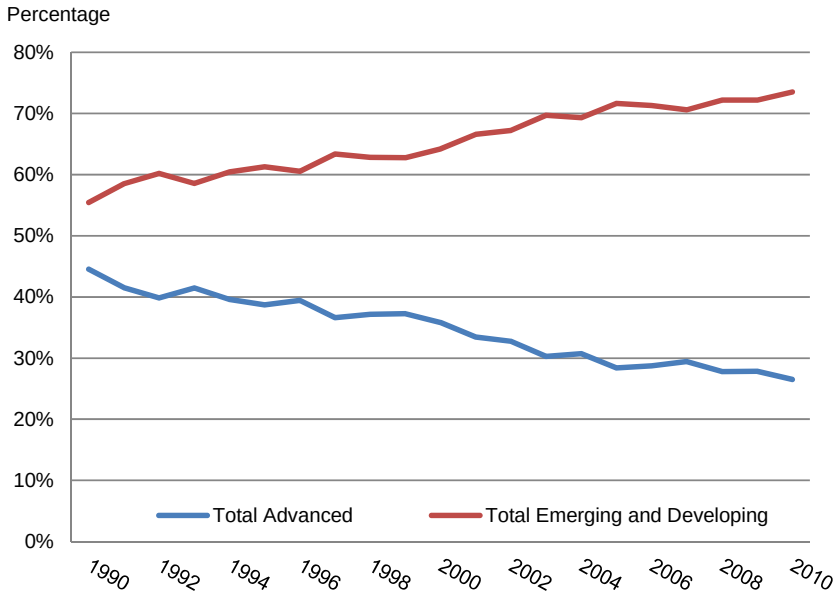
The potato is ranked by the Food and Agriculture Organization of the United Nations (FAO) as the world's fourth most important food plant behind only rice, wheat, and corn (FAO, 2006). As one of the most diverse and nutritious crops on Earth, potatoes can be grown on most continents and come in an array of shapes, sizes, and colors (IPC, 2012a).

More than 5,000 individual varieties are thought to exist worldwide, however, modern cultivars have been found to share a single origin limited to the southern regions of Peru and northeast sections of Bolivia. Potatoes found growing in this area were cultivated between 7,000-10,000 years ago though it wasn't until the 16th century when Spanish explorers brought potatoes back to Europe (Kiple and Ornelas, 2000).

Once the tuber arrived in Europe, it slowly gained popularity, first as a novelty shared primarily among royal courts and then as an inexpensive and scurvy-preventing food source for sailors. Later, the general population overcame misgivings about the relative of the poisonous nightshade plant and accepted the potato as both a hedge against famine and a nutritious and hardy staple crop (Kiple and Ornelas, 2000).

In the past 20 years, considerable changes have taken place in world potato markets. Production has shifted away from some traditional potato-producing regions, including Europe and North America, to the developing world where the need for nutritionally rich staple crops is arguably greater. New and significant suppliers, most notably China, have emerged as production leaders while worldwide demand for processed potato products has steadily grown (FAO, 2008a).

Figure 7: Percentage of Total World Potato Harvest by Advanced vs. Emerging and Developing Counties, 1990-2010



Source: United Nations, Foreign Agricultural Organization; FOASTAT; International Monetary Fund-World Economic Outlook-2010 (Retrieved 09/14/12).

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Consumers increasingly appreciate the diversity of varieties available and the numerous products that can be derived from the tubers. After cereals, potatoes are thought to provide the main carbohydrate source for the European diet and potatoes are the leading vegetable crop in the United States, contributing about 15 percent of all farm sales receipts for vegetables (USDA-ERS).

Growth in Emerging and Developing Country Production

According to the FAO, potato production attributed to "advanced" nations has declined by approximately 1 percent each year for the past 20 years and an increasing share of that production is being processed (FAO, 2008a).[2] In contrast, production and consumption in "emerging and developing" countries focuses on fresh (table stock) production and has grown by about 1 percent per year even as collectively, these countries remain net importers of the tuber (FAO, 2008b; FAOSTAT).

In 1990, emerging and developing countries, which include both Russia and China, accounted for a slight majority of production (55.5 percent). By 2010, emerging and developing country production comprised nearly two-thirds of world production (73.5 percent) relative to the 26.5 percent production share of advanced countries. A near 20 percent increase in the world production share over a 20-year period is a remarkable accomplishment and testament to the growing popularity of the crop in low-income and newly industrialized markets. Increased cultivation of potatoes in economically challenged and food-insecure countries stems, in part, from the fact that the tuber is relatively nutritious, providing a sizable amount of micro and macro nutrients for each medium-sized potato serving (IPC, 2012a).

Potatoes also rank highly on FAO's nutritional productivity index, a measure relating water use and resultant calorie production. Every cubic meter of water applied to the potato crop in cultivation produces an average of 5,600 calories of dietary energy. By comparison, corn, wheat, and rice respectively produce just 3,860; 2,300; and 2,000 calories with the same water application (FAO, 2008c). Finally, some of the growing popularity in developing countries may be explained by rising potato yields in contrast to stagnant and declining yields gains for major cereals in recent years (World Bank, 2008).

[2]The terms "emerging and developing" and "advanced" appear in this discussion in accordance with the categorizations and definitions described in International Monetary Fund-World Economic Outlook-2010.

Table 21--Select Potato nutrition facts

Nutrient	% Daily Value
Total Fat	0
Total Carbohydrate	12
Fiber	16
Protein	3
Vitamin C	35
Calcium	4
Iron	10
Potassium	13

Serving size: 1 medium potato (173 g) baked with skin on. Based on 2000 calorie diet and 4,800 mg potassium daily value. Source: USDA Household Commodities Fact Sheet.

Shifting Regional Production

As emerging and developing countries are contributing to a growing proportion of total potato production, regional supply patterns are shifting. Historically, most potatoes were grown in Europe and North America; however, in 2010, Asia produced more potatoes than any other single region and grew close to 50 percent of total world output.

Europe continues to contribute a sizeable (33 percent in 2010) though declining, share of total production. In 2000, European production accounted for 45.5 percent of total production, down from 60.1 percent in 1990. North American potato production has generally declined for the past 15 years and the region now supplies slightly less than 7 percent of world total production. Despite a general trend towards reductions in total production and harvested area, North America still generated the highest yield of any region at 16.62 metric tons per acre; 235 percent more than the 2010 world average of 7.05 metric tons per acre.

Yields from Asia averaged 6.78 metric tons per acre in 2010 which contributes to 6.79 times as much production being grown on 16.61 times as many acres, relative to the North American crop. For every one acre of potatoes cultivated in North America, 2.45 would need to be planted in Asia to realize the same output.

Improvements in cultivation practices and seed stock are likely to make Asian production more efficient in years to come. For other developing regions such as Africa, where relative production inefficiencies are greater, improvements in cultivation practices have the potential to increase harvests without proportional increases in cultivated area and to ultimately contribute to enhanced food security (IPC, 2012a).

Production Rankings and Totals

A comparison of production rankings from 2000 to 2010 provides a synopsis of major industry developments. In 2010, top-ranked China clearly produced the most potatoes; India, the next largest producer, grew only half as much volume while still

Table 22--Top potato producing countries, 2000 and 2010

Rank in 2000	Country	2000	Country	2010
		---Metric tons---		*---Metric tons---*
1	China	64,596,119	China	74,799,084
2	Russian	34,965,200	India	36,577,300
3	India	22,242,700	Russian	21,140,500
4	United States	19,852,500	Ukraine	18,705,000
5	Poland	19,378,900	United States	18,016,200
6	Ukraine	17,343,500	Germany	10,201,900
7	Germany	11,916,800	Poland	8,765,960
8	Belarus	7,767,600	Bangladesh	7,930,000
9	Netherlands	7,115,000	Belarus	7,831,110
10	United Kingdom	6,649,000	United Kingdom	6,843,530

Source: USDA, Economic Research Service based on data of the United Nations Food and Agriculture Organization, FAOSTAT (Retreived 09/14/12).

experiencing a 64 percent growth in output between 2000 and 2010. Another emerging economy, Bangladesh, entered the top 10 rankings in 2010 after being ranked 17th in 2000. U.S. production slipped slightly and its ranking fell to #5 from the previously-held #4 spot. The decline is consistent with a trend towards gradually decreasing North American production.

Russia was unseated as the second largest potato growing nation in 2010 though it remained the largest European producer. Russian output has generally declined in recent years and has occasionally dropped significantly, as in 2010, in response to pest pressure and weather challenges (PotatoPro, 2010).

When potato production is measured as a share of world output, China's dominant position is again clear; fully one-fifth of total world production is attributed to the country. Potatoes are grown as both as staple and cash crop in China. In the mountainous Northern and Southwest regions, production provides cash income; in the lower plains, potatoes are primarily grown for household subsistence consumption (IPC, 2012b; FAO, 2008d).

Another significant contributor to global production, India, grew more than one-tenth of total world output in 2010. For more than two decades, India has experienced relatively steady growth in potato production, yields, and harvested area. The upward trends in India, as with other emerging and developing countries, are largely sustained by a growing number of citizens with relatively higher incomes, rising demand for convenient and ethnically-diverse foods, and increased urbanization (FAO, 2008b/d). Consumption in rural areas is lower; potatoes are generally not considered to be a staple and are most often grown as a cash crop (IPC, 2012b; FAO, 2008d).

While select countries, such as India and China, have increased their share of world production others, including Poland, have experienced notable production declines. Polish potato output between 2000 and 2010 was down nearly 55 percent and, collectively, the share of production contributed by the historically dominant growing regions of the U.S., Russia, and Western Europe declined from 27 percent in 2000 to just above 20 percent in 2010.

World Potato Consumption

Average world potato consumption was estimated at about 69 pounds per person in 2005 though significant regional variation is observed. Despite being the world's leading production region, a large population served to reduce Asian per capita consumption to a relatively modest at 52.7 lbs/year. In contrast, Europe collectively

Table 23-- Share of world production

Geographic Area	2000	2010
	----------*% of total*----------	
China	20.26	23.07
India	7.64	11.28
United States	7.12	5.56
Western Europe	9.96	8.70
Russian Federation	10.38	6.52

Source: USDA, Economic Research Service based on data of the United Nations Food and Agriculture Organization, FAOSTAT (Retreived 09/14/12).

produces fewer potatoes but with a relatively smaller population and supplementary imports, the region enjoys the largest average per capita consumption at 193.6lbs/year. Per capita consumption in Africa is relatively low though developing nations on the continent are cultivating increasing amounts of potatoes and consumption may increase over time as cultivation practices improve.

In addition to consumption of fresh potatoes, regional per capita consumption numbers are influenced by demand for processed potato products including French fries. Processed potato demand has generally grown in Europe and the U.S., however, the greatest expansion has been in the emerging population centers of the Middle East, South America, and East Asia, including China (FAO, 2008d). The tripling of the U.S. French fry export volume between 1990 and 2010 and the doubling of European exports in the last 10 years are evidence of the substantial growth in world demand for frozen potatoes (USDA-FAS).

Consumption levels in advanced economies have been further supported by the increased availability of novel varieties, packaging improvements, and more convenient preparations. Specialty cultivars have become common features in many U.S. grocery stores and may serve to reintroduce potential consumers to the spud. Easy-mash and pre-made, refrigerated potatoes are also making it simple for convenience-seeking consumers to enjoy potato products. In the years to come, domestic consumption may be further strengthened by a growing appreciation for plants, like potatoes, that contain high levels of resistant starch. Potential consumer concerns about the presence of acrylamide in cooked starchy foods may nominally impact potato demand while also creating further consumer education opportunities for the sector.

Trade

Just a small fraction, approximately 6 percent, of total world potato production is estimated to be traded as the inherent bulkiness of the crop makes it relatively expensive to transport and perishability concerns further complicate international movement (FAO, 2008c). Despite these impediments, international potato trade has been increasing in recent years; doubling in volume and rising by four fold in terms of dollar value (USDA-FAS; FAOSTAT).

Table 24--World potato consumption by region, 2005

Region	Population	Total Potato Consumption	Pounds per capita
	----1,000----	*----Metric tons----*	
Africa	904,388	12,571,000	30.64
Asia/Oceania	3,934,644	94,038,000	52.69
Europe	739,203	64,902,000	193.57
Latin America	562,270	11,639,000	45.64
North America	330,400	19,824,000	132.28
WORLD	6,484,792	202,974,000	69.00

Source: USDA, Economic Research Service based on data of the United Nations Food and Agriculture Organization, FAOSTAT (Retreived 09/12/14).

Much of the trade growth stems from movement of frozen potato products. Many of the fastest growing markets are in emerging and developing markets, which are distanced from concentrations of processing potato capacity in sections of the European Union (EU) and North America. To satisfy demand for processed products, the frozen-potato export market is likely to becoming increasingly important, to the U.S., Canada, and select EU countries, including Belgium and the Netherlands, concurrent with growth in processing capacity in China and India.

Belgium tops the ranks of fresh-potato importing countries, a reflection, of not only high per capita consumption but also the country's position as one of the world's largest manufacturers and exporters of frozen potato products. Russian potato imports fluctuate in negative correlation with domestic production. In 2010, with persistent drought conditions that reduced the local harvest 25-40 percent, Russia imported the second highest dollar value of potatoes (FAOSTAT; PotatoPro, 2010). As potato production in Europe declines, and demand for processed potato products remains strong both domestically and via export markets, select European countries may increase imports of processing and table stock potatoes.

For several decades, the Netherlands has remained a major producer as well as the world's top potato exporting country (in terms of value). Assisted by favorable growing conditions, access to major shipping channels and variety diversity, the Netherlands exported about $78 million worth of seed, fresh, and processed potatoes in 2010. Other European countries including France, Germany, and Belgium are ranked in the top 10 in terms of value of exports. These EU members harvest substantial production volumes which, in turn, increase the supply available for fresh sales, processing, and exportation. In France's case, exports include a sizable amount of seed potatoes while Germany and Belgium export relatively more processed potatoes (FAO, 2008d). Canada and the United States, frequently rank among the top five exporting countries, with sales abroad comprised of mix of processed, fresh/table stock, and seed potatoes.

In 2010, the world's largest producer of potatoes, China, ranked a modest 10th place in value of exports behind several Western countries, Egypt, and Iran. This ranking is reflective of the fact that most Chinese production is at a subsistence level and consumed domestically. Given that in 2000, China did not rank in the top twenty and only occasionally made the list in the 1990s, China's decade-long rise in prominence in the potato exports markets is remarkable.

Summary

The last 20 years have brought dramatic changes to the global potato marketplace and serve to highlight the crop's value in feeding both food-insecure and relatively well-nourished populations. Enhanced cultivation techniques and improved access to disease-free seed stock in emerging and developing countries have assisted to grow local food supplies. Meanwhile, new market offerings that deliver convenience, value, and nutritional superiority, in combination with sustained demand for fry products, have supported consumption in advanced economies.

Looking forward to the next 20 years, ongoing change is expected for an industry already made notable by shifting regional production. Technological innovations will impact all of agriculture. Growing world populations will continue to demand increasing amounts of nutritious and efficient crops. Weather will surely provide unexpected challenges and opportunities along the way. Despite uncertainty about the nature of the changes to come, recent history demonstrates that the global potato marketplace will continue to adapt and thrive.

Table 25--Top potato importing countries ranked by value of imports, 2010

Rank	Country	Quantity	Value	Unit value
		---Metric tons---	*---$1,000---*	*---$/Metric ton---*
1	Belgium	1,382,592	2,908,089	216
2	Russia	664,348	272,861	411
3	Spain	777,942	248,088	319
4	Germany	573,769	237,133	413
5	Netherlands	1,220,236	233,054	191
6	Italy	706,995	232,713	329
7	USA	415,411	148,046	356
8	United Kingdom	248,841	119,340	480
9	United Arab Emirates	38,387	111,196	2897
10	Egypt	146,787	108,283	738
11	France	414,729	107,880	260
12	Portugal	308,856	99,496	322
13	Canada	234,658	88,858	379
14	Algeria	113,263	74,428	657
15	Greece	132,643	67,565	509
16	Malaysia	155,951	65,046	417
17	Poland	235,438	63,792	271
18	Iraq	180,535	61,963	343
19	Lebanon	113,203	48,313	427
20	Czech Republic	151,626	43,934	290

Source: USDA, Economic Research Service based on data of the United Nations Food and Agriculture Organization, FAOSTAT (Retreived 09/14/12).

Table 26--Top potato exporting countries ranked by value of exports, 2010

Rank	Country	Quantity	Value	Unit value
		---Metric tons---	*---$1,000---*	*---$/Metric ton---*
1	Netherlands	1,883,601	789,735	419
2	France	2,318,680	613,074	264
3	Germany	1,592,520	306,905	193
4	Canada	493,657	172,606	350
5	United States	386,176	165,005	427
6	United Kingdom	336,699	158,290	470
7	Belgium	784,858	152,667	195
8	Egypt	298,557	129,562	434
9	Iran (Islamic Republic of)	262,973	104,621	398
10	China	258,683	104,277	403
11	Italy	168,099	98,756	587
12	Spain	240,527	98,460	409
13	Israel	206,640	82,656	400
14	Denmark	171,480	69,829	407
15	Syrian Arab Republic	112,123	51,604	460
16	Pakistan	245,329	50,663	207
17	Cyprus	58,188	44,111	758
18	India	173,864	28,624	165
19	Saudi Arabia	135,488	26,838	198
20	Austria	84,069	26,508	315

Source: USDA, Economic Research Service based on data of the United Nations Food and Agriculture Organization, FAOSTAT (Retreived 09/14/12).

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Vegetables and Pulses Data

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 four sections:

Outlook Tables, in Excel and PDF format, contain recent data on fresh and processing per capita use, acreage, production, prices, cash receipts, and U.S. trade, as well as data on potatoes, sweet potatoes, mushrooms, dry edible beans, and dry peas and lentils. Tables are grouped into 13 subsections and a summary table. Eventually, all data contained in the Vegetables and Pulses Outlook tables will be encompassed in the Data by Category and Data by Commodity series.

Yearbook Tables, in Excel and a single PDF file, contain a time series of annual and monthly data for U.S. farm acreage, production, prices, trade, per capita use, and more. Eventually, all data currently 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, production, etc.) provides current 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 on a marketing year basis.

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Web Sites

A. Vegetables and Pulses Outlook: The home page of this report.
http://www.ers.usda.gov/topics/crops/vegetables-pulses/market-outlook.aspx

B. U.S. Trade Data—GATS: This recently revised 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

C. ERS Vegetables and Pulses Data: Monthly and annual data for U.S. imports and exports, monthly Producer and Consumer Price Indexes, and monthly average retail prices.
http://www.ers.usda.gov/data-products/vegetables-and-pulses-data.aspx

D. Vegetables and Pulses Topics Page: This ERS site contains special articles, data sets, and links (the tomato, dry beans, and potatoes pages are found here).
http://www.ers.usda.gov/topics/crops/vegetables-pulses.aspx

E. USDA 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.
http://www.marketnews.usda.gov/portal/fv

F. NASS Vegetables: Links to USDA, National Agricultural Statistics Service's annual and quarterly reports on vegetables & melons.
http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1177

G. Organic Farming and Marketing: USDA, ERS Briefing Room contains articles, data, graphics, and links. http://www.ers.usda.gov/data-products/organic-production.aspx

H. FAS Fruit and Vegetable Page: USDA, Foreign Agricultural Services page with special articles, country horticultural reports, presentation and charts, data, and links.
http://www.fas.usda.gov/htp/fruit_veg.asp

Appendix Tables

Appendix Tables from *Vegetable and Pulses Outlook* newsletters will no longer be attached to the report. The appendix tables, along with many other data series for Vegetables and Pulses, are still available as part of the *Vegetable and Pulses* Data at http://www.ers.usda.gov/data-products/vegetables-and-pulses-data/outlook-tables.aspx. The specific tables, previously appended to the newsletters, can be found in the Outlook Tables under "Vegetable Prices."