United States Department of Agriculture

Economic Research Service | Situation and Outlook Report

VGS-365 | December 17, 2020

Next release is April 16, 2021

Vegetables and Pulses Outlook

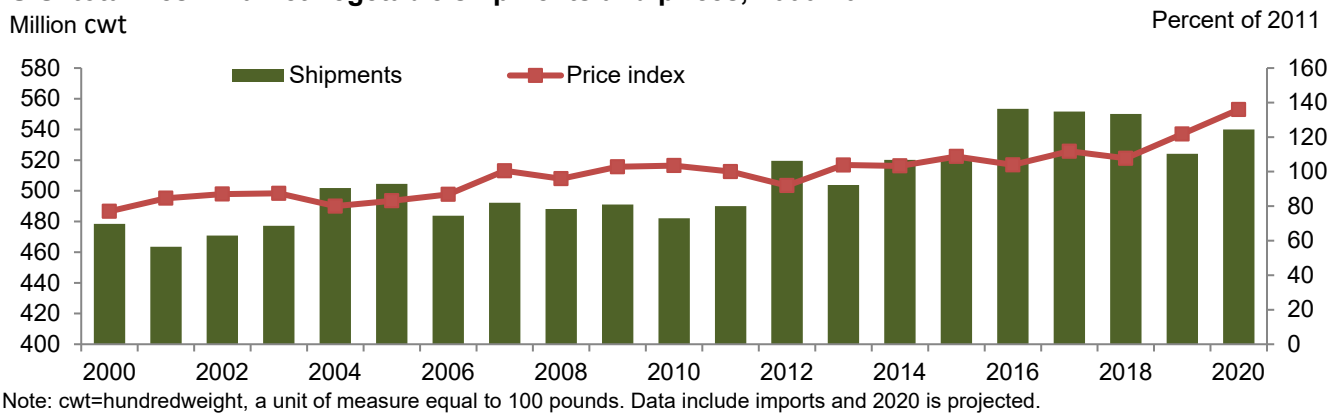
Gary Lucier and Wilma Davis

In this report:

Vegetables Withstand Pandemic

Domestically-grown vegetable and pulse crop output (excludes imports) likely declined in 2020 as smaller fresh-market vegetable and potato crops outweighed larger processing tomato, dry bean, dry pea, and lentil crops. However, by adjusting production methods and marketing channels, meeting transportation challenges, and increasing imports to fill supply gaps, the industry continued to deliver critical food to the nation. Although this winter may be challenging due to a possible resurgence of COVID-19, the year ahead appears to be shaping up as one of transition from the many adjustments dictated by the full-scale pandemic of 2020 to an economy that slowly and more fully incorporates pre-pandemic activities and behaviors. The transition is largely dependent on how quickly available vaccines are administered and accepted by the public. Thus, as consumer confidence is slowly bolstered by successful vaccines and an eventual return to social “normalcy,” vegetable production, marketing, and transportation schedules are expected to shift back toward pre-pandemic levels by the end of 2021.

U.S. total fresh-market vegetable shipments and prices, 2000-20



Note: cwt=hundredweight, a unit of measure equal to 100 pounds. Data include imports and 2020 is projected.

Source: USDA, Economic Research Service using data of USDA, Agricultural Marketing Service, *Market News* and USDA, National Agricultural Statistics Service.

Industry Overview

Imports Fill Gaps in Domestic Output

Preliminary data suggest total 2020 movement of fresh market vegetables will post a small gain over a year earlier despite the pandemic's negative impact on the foodservice industry and widespread crop losses due to the abrupt economic shutdown in March. When official data are available in February 2021, expectations are that utilized domestic production and domestically sourced shipments will register reductions from a year earlier. Data are also expected to confirm an increase in fresh-market imports and a decline in export volume, which in combination could offset lower domestic fresh-market vegetable output.

This would be surprising considering the toll the pandemic has taken on restaurant and institutional demand. For all fresh and processed vegetables, U.S. consumers generally sourced about one-third of their volume-based consumption through away-from-home dining pre-COVID. According to the U.S. Census Bureau, sales at eating and drinking places fell 19 percent from a year earlier over the first ten months of 2020. If aggregate vegetable supplies were indeed similar from the previous year, this implies the sizeable reduction in foodservice may have been largely offset by a combination of increased grocery store sales (up 12 percent through October), community/farmer's markets, and deliveries through several food donation programs such as USDA's Farmers to Families Food Box Program and the long-standing Emergency Food Assistance Program.

Given declining inventories the past several years and with much of the crop planted or in the process of being planted when the pandemic began, processing tomato production registered a small gain in 2020 despite weather-impacted yields. Aside from catsup (due to a close association with french fries, which saw reduced demand), products made from tomato paste were in demand domestically during the pandemic. Increased home-based meal preparation favored comfort foods such as pasta and soups while the enduring popularity and low-contact of pizza delivery and rising retail frozen pizza sales likely boosted pizza sauces. Several major pizza delivery chains reportedly posted double-digit sales gains in 2020. Although U.S. exports of processed tomato products have been sluggish and world supplies are above a year earlier, low U.S. stocks and good domestic demand may result in rising contract production in 2021.

The first estimate (November) of the 2020 potato crop produced in the 13 states included in the USDA National Agricultural Statistics Service (NASS) estimates program indicated a 3 percent

reduction from a year earlier to 415 million hundredweight (cwt). If estimates hold, this would be the smallest potato crop since 2010. An unsettled early spring because of the pandemic caused the industry to plant 4 percent fewer acres in 2020--a year that normally might have featured higher acreage following higher 2019 prices.

U.S. dry bean production is estimated to soar by 68 percent in the 2020/21 (September – August) marketing season. The top 3 U.S. states (North Dakota, Michigan, and Minnesota) produced 76 percent of all dry beans in 2020. U.S. dry bean exports overall are down by 4 percent from the previous season which continues a downward trend as the 2018/19 season was previously down by 8 percent. U.S. dry bean imports overall are up by 34 percent from the previous season with the most predominant U.S. dry bean classes imported in the 2019/20 season being mung beans (23 percent); kidney beans (19 percent), which include dark red, light red, and unspecified kidney beans; black beans (12 percent); and pinto beans (9 percent).

U.S. dry pea and lentil production are divergent as dry pea production is down by 17 percent while lentil production is up by 21 percent for 2020. Harvested acreage, production, value, and yield for dry peas and lentil estimates followed similar divergent trends from the previous year. U.S. dry pea export volume has increased 36 percent while lentil export volume is down by 52 percent with lentil exports to Canada declining 64 percent from the 2018/19 season. Low lentil prices fell below the loan rate in 2019 and 2020 but no dry pea price fell below the loan rate in 2019 or 2020 thus far.

U.S. large and small chickpea area planted declined 38 and 62 percent respectively from last year’s estimates. Chickpea estimates for harvested acreage, production, and value followed similar downward trends from the previous year. The decrease in chickpea planted, harvested, and production is a result of grower reactions to low prices. Low chickpea prices fell below the loan rate in 2019 but no chickpea prices fell below the loan rate in the 2020 season thus far. Chickpea acres and prices have been trending down for the past 2 years following a large supply and soaring prices in 2017 and 2018 in addition to ongoing trade duties from India.

U.S. Agaricus mushroom prices have increased 6 percent while specialty mushroom prices have declined by 2 percent from last year. The decline in specialty mushroom prices and the increase in Agaricus mushroom prices can in part be attributed to changes in consumer demand and higher grower costs. The most common mushroom varieties (Agaricus) have experienced increasing demand at supermarket retailers and farmers markets as consumers shift their consumption away from restaurants during the coronavirus pandemic.

Table 1: U.S. vegetable and pulse industry at a glance, 2017-20[1]

Item	Unit	2017	2018	2019	2020	Percent change 2019-20
Area harvested						
Vegetables fresh	1,000 acres	1,541	1,447	1,357	1,316	-3.0
Vegetables processing[4]	1,000 acres	1,170	1,160	1,017	1,055	3.7
Potatoes	1,000 acres	1,045	1,015	937	916	-2.3
Dry beans, peas and lentils	1,000 acres	4,096	3,554	3,064	3,367	9.9
Other[2]	1,000 acres	163	148	149	150	0.7
Total	**1,000 acres**	**8,015**	**7,323**	**6,529**	**6,804**	**4.2**
Production						
Vegetables fresh	Million cwt	396	369	377	366	-3.0
Vegetables processing[4]	Million cwt	333	357	346	351	1.4
Potatoes	Million cwt	451	450	424	415	-2.1
Dry beans, peas and lentils	Million cwt	58	62	55	64	16.7
Other[2]	Million cwt	45	37	40	41	2.5
Total	**Million cwt**	**1,282**	**1,275**	**1,241**	**1,237**	**-0.3**
Crop value						
Vegetables fresh	$ millions	11,951	10,078	11,130	11,519	3.5
Vegetables processing[4]	$ millions	1,694	1,720	1,500	1,580	5.3
Potatoes	$ millions	4,133	4,006	4,217	4,363	3.4
Dry beans, peas and lentils	$ millions	1,343	1,313	1,102	1,406	27.6
Other[2]	$ millions	1,883	1,883	1,766	1,886	6.8
Total	**$ millions**	**20,966**	**19,000**	**19,324**	**20,753**	**7.4**
Unit value[3]						
Vegetables fresh	$/cwt	30.18	27.31	29.52	31.50	6.7
Vegetables processing	$/cwt	5.09	4.82	4.34	4.50	3.8
Potatoes	$/cwt	9.16	8.90	9.94	10.50	5.6
Dry beans, peas and lentils	$/cwt	23.16	21.18	20.12	22.00	9.4
Other[2]	$/cwt	41.84	50.89	44.15	46.00	4.2
Total	**$/cwt**	**16.35**	**14.90**	**15.57**	**16.78**	**7.7**
Imports						
Vegetables fresh	$ millions	7,495	7,936	8,502	9,575	12.6
Vegetables processing[4]	$ millions	2,986	3,192	3,139	3,500	11.5
Potatoes	$ millions	1,399	1,546	1,562	1,775	13.6
Dry beans, peas and lentils	$ millions	275	275	237	300	26.6
Other[5]	$ millions	784	854	860	840	-2.3
Total	**$ millions**	**12,939**	**13,803**	**14,300**	**15,990**	**11.8**
Exports						
Vegetables fresh	$ millions	2,095	2,124	2,209	2,107	-4.6
Vegetables processing[4]	$ millions	2,319	2,232	2,192	2,010	-8.3
Potatoes	$ millions	1,814	1,786	1,925	1,675	-13.0
Dry beans, peas and lentils	$ millions	841	536	622	775	16.1
Other[5]	$ millions	538	549	597	545	-8.7
Total	**$ millions**	**7,607**	**7,227**	**7,545**	**7,112**	**-5.7**
Per-capita availability						
Vegetables fresh	Pounds	157.1	149.2	153.4	150.0	-2.2
Vegetables processing[4]	Pounds	104.7	112.2	114.3	115.0	0.6
Potatoes	Pounds	117.8	116.0	118.8	115.0	-3.2
Dry beans, peas and lentils	Pounds	11.1	13.7	11.1	12.5	12.8
Other[2]	Pounds	12.0	9.5	11.7	11.8	0.9
Total	**Pounds**	**402.7**	**400.6**	**409.3**	**404.3**	**-1.2**

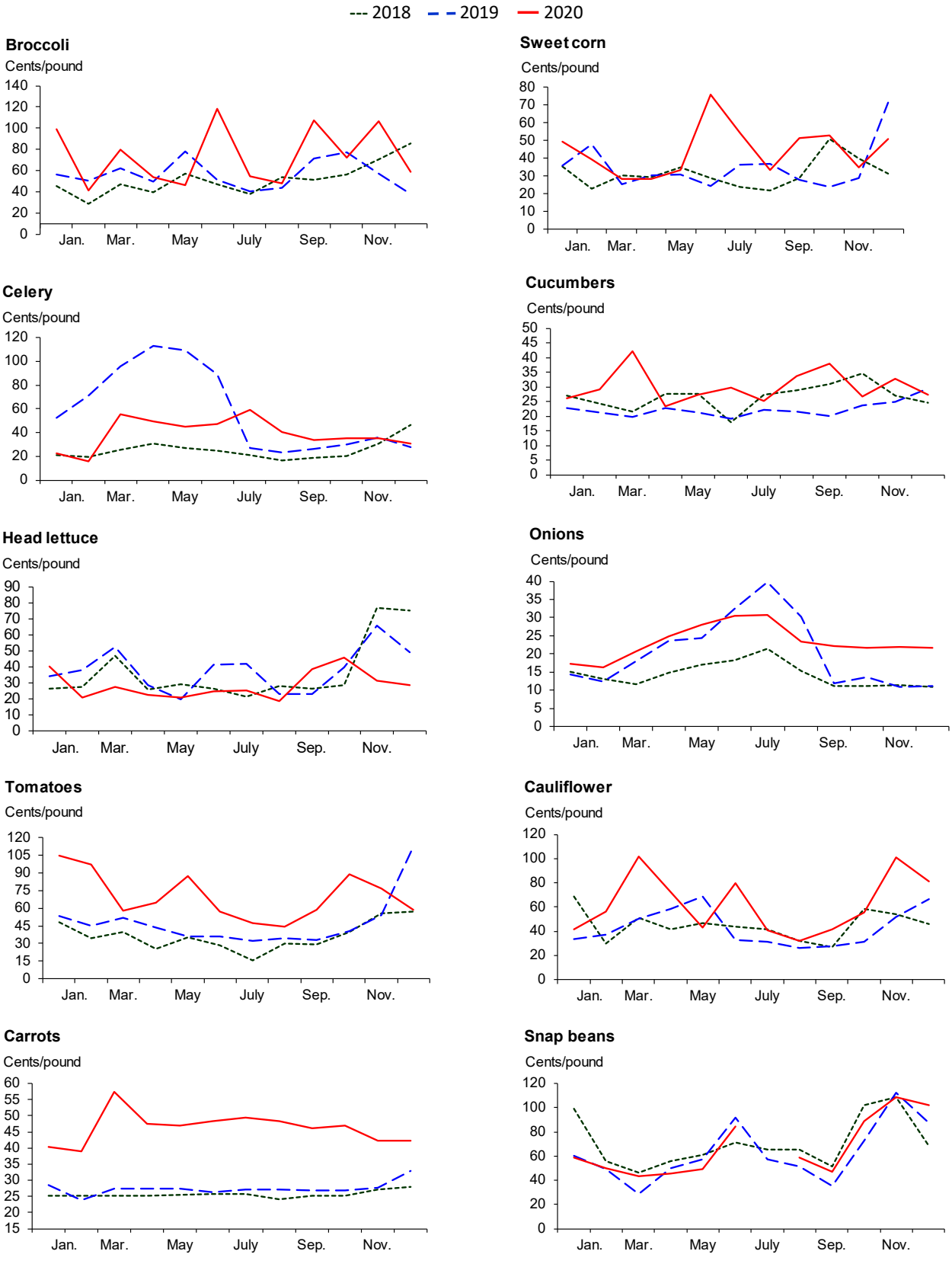
[1] Total values rounded. [2] Includes sweet potatoes and mushrooms. [3] Ratio of total value to total production.

[4] Includes canned, frozen, and dried. Excludes potatoes, pulses, and mushrooms. [5] Other includes mushrooms, sweet potatoes, and vegetable seed. All trade data are on a calendar-year basis. Hundredweight (cwt)=100 pounds.

Sources: USDA, Economic Research Service, using data from USDA, National Agricultural Statistics Service, and U.S. trade data from U.S. Department of Commerce, Bureau of the Census.

Figure 1

Free-on-board (f.o.b.) prices for selected fresh-market vegetables



Sources: USDA, National Agricultural Statistics Service and USDA, Agricultural Marketing Service, Market News.

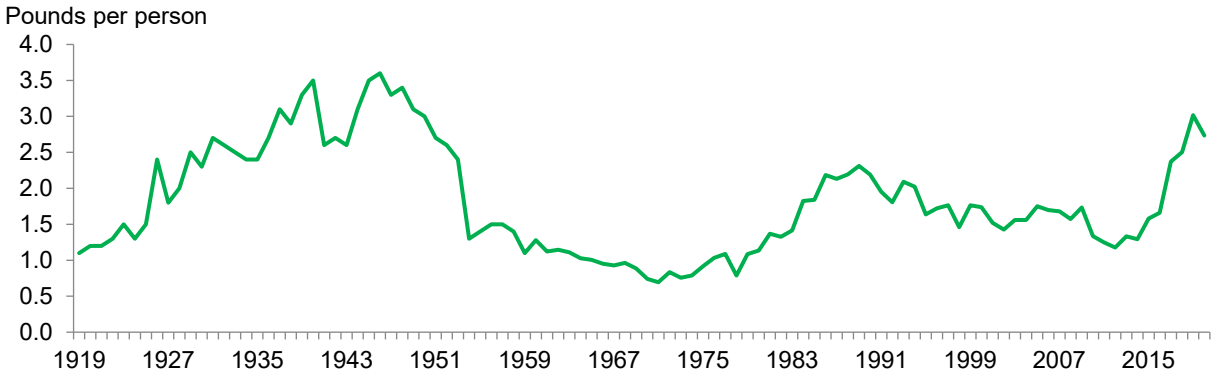
Commodity Highlights

Cauliflower

Consumer culinary interest in fresh and frozen cauliflower has been rising. Fresh cauliflower has enjoyed several surges of popularity. The first was in the 1940s when per capita availability peaked at a record 3.6 pounds in 1946 and again in the late 1970s and 1980s, last reaching a peak per capita availability of 2.3 pounds in 1989. Interest in fresh-market cauliflower then fell off until per capita availability bottomed out at 1.2 pounds per person in 2012. Then in 2015, interest began to soar until per capita availability reached 3 pounds per person in 2019 (figure 2). This recent interest is largely based on the widespread popularity of low-carb and gluten-free dietary trends. These trends have also been embraced and furthered by food manufacturers who have concurrently introduced a wide variety of new products featuring fresh and frozen cauliflower.

Cauliflower is a low-calorie and vitamin and mineral-rich vegetable whose versatility stems largely from its mild natural flavor and ability to take on many seasonings. This vegetable, which can be found in fresh form in several different colors, has been popularized as an ingredient in a variety of gluten-free products such as pizza crusts, tortillas, crackers, chips, frozen tots, mac and cheese, bread, rice, and many more. Mashed cauliflower can be found in supermarkets and on restaurant menus.

Figure 2
U.S. fresh cauliflower per capita domestic availability, 1919-2020



Source: Calculated by USDA, Economic Research Service.

Table 2. Fresh cauliflower: U.S. supply and availability

Period	Area harvested	Yield per acre	Produc-tion	Imports	Total supply	Availability			Price
						Exports	Domestic	Per capita	
	1,000 ac	*Cwt/ac*	*Million lbs*					*Lbs*	*Dollars/cwt*
1970-74	28,220	97	160	0	160	0	160	0.8	15.14
1974-79	37,358	95	225	2	227	26	201	1.0	23.22
1980-84	51,268	105	366	11	377	48	329	1.4	30.52
1985-89	64,920	115	597	16	612	94	518	2.1	28.64
1990-94	58,960	128	663	16	678	162	517	2.0	28.18
1995-99	47,130	153	635	23	658	203	456	1.7	32.94
2000-04	40,476	163	608	21	629	180	449	1.6	31.88
2005-09	38,768	180	673	24	697	188	509	1.7	36.44
2010-14	36,572	183	639	41	680	280	401	1.3	43.82
2015-19	43,062	197	837	143	980	254	725	2.2	51.30

Note: Ac=acre, Cwt=hundredweight (100 lbs). 1/ Acreage and yield include fresh and processing.

Source: USDA, Economic Research Service.

The fresh cauliflower crop had a nominal dollar farm value of $466 million in 2019, up 12 percent from the 2016-18 average. California and Arizona are the leading producing states for fresh-market cauliflower. Together, they account for 94 percent of U.S. fresh cauliflower acreage. The majority of processing is for frozen use but over the past few years, manufacturers have moved much of this to lower-cost facilities in Mexico. In 2019, Mexico (58 percent) and various nations within the European Union (27 percent, led by Spain and Belgium) accounted for the majority of the frozen cauliflower imported by the United States. According to the 2017 Census of Agriculture, California and Oregon have been the top domestic processors of cauliflower with 96 percent of processing area (shared about equally between them). In 2019, the vast majority of frozen cauliflower products sold in the United States were imported.

Import penetration in the U.S. fresh cauliflower market has soared as the consumption profile of cauliflower has risen over the past several years (table 2). In 2019, imports accounted for nearly 23 percent of domestic availability (a proxy for consumption), up from 13 percent in 2014 and 5 percent in 2009. Over the previous 5 years (2015-19), fresh-market cauliflower imports rose an average of 37 percent annually. This compares with an average annual increase of 13 percent during 2010-14 and just 3 percent annually during 2005-09.

Imports of fresh cauliflower totaled 231 million pounds in 2019 but are projected to decline 10 percent in 2020 due to the impact of the pandemic. Mexico has long been a year-round supplier and the source for about 82 percent of the annual volume. Canada, also a long-time supplier, provides about 17 percent of the annual import volume with most shipments occurring during the summer and early fall.

Bell Peppers

U.S. production of nonpungent (bell) peppers for all uses averaged 1.3 billion pounds during 2017-19. The U.S. produces 4 percent of the world's capsicum peppers (nonpungent and pungent), ranking sixth behind China, Mexico, Turkey, Spain, and Nigeria. The fresh market accounts for about 85 percent of U.S. production with the remainder earmarked for various processing uses. The fresh bell pepper crop had a nominal dollar farm value of $523 million in 2019, with the processing crop valued at $35 million. California, Florida, Georgia, and New Jersey are the leading producing states, averaging about 89 percent of U.S. bell pepper output. California dominates the processed product subsector which reflects both the status as the top bell pepper producing state and the presence of frozen vegetable producing firms and major vegetable dehydrating firms. South Florida winter-season growers shouldered the brunt of the pandemic’s initial negative impact (as the only active area harvesting in mid-March) caused by the abrupt loss of foodservice and institutional demand and first month of market turmoil.

Bell peppers are produced and marketed year-round, with domestic shipments peaking during May and June and import shipments highest during the winter months. As with fresh tomatoes and fresh cucumbers, both domestic and import bell pepper growers are increasingly utilizing protected culture (e.g., high-tech greenhouses, tunnels, hoop houses, etc.), with conventional field-grown production beginning to shrink. For field-grown peppers, concentration of acreage has continued to rise. According to the 2017 Census of Agriculture, farms that harvest at least 15 acres of bell peppers accounted for 2.2 percent of bell pepper farms and 84 percent of U.S. bell pepper area.

In 2012, 2.9 percent of all the farms that reported bell peppers harvested at least 15 acres of bell peppers, covering 86 percent of U.S. bell pepper harvested area. Per capita availability of bell peppers for all uses averaged 10.8 pounds during the 2010s—up 22 percent from the previous decade. Bell pepper availability has posted double-digit gains each decade since the 1960s (table 3). Since records began in 1919, bell pepper availability has never posted a decade-average decline, either rising or remaining steady compared with the average of the previous decade. According to consumer diet surveys, about two-thirds of all bell peppers are purchased at retail establishments and consumed at home with the remainder obtained through various foodservice venues.

Table 3. Bell peppers: U.S. supply and availability, all uses

Period	Area harvested	Yield per acre	Produc-tion	Imports	Total supply	Availability			Price
						Exports	Domestic	Per capita	
	1,000 ac	*Cwt/ac*	*Million lbs*					*Lbs*	*Dollars/cwt*
1970-74	48,216	94	452	79	531	23	508	2.4	13.02
1974-79	55,446	97	535	117	652	50	602	2.7	17.82
1980-84	55,850	102	629	168	797	72	725	3.1	22.60
1985-89	--	--	909	208	1,117	88	1,029	4.2	22.95
1990-94	65,650	229	1,344	553	1,897	150	1,748	6.8	27.83
1995-99	60,320	253	1,523	676	2,199	130	2,069	7.6	31.48
2000-04	55,972	292	1,631	928	2,559	161	2,398	8.3	30.40
2005-09	52,820	304	1,615	1,389	3,004	147	2,857	9.5	34.92
2010-14	45,940	336	1,589	1,825	3,414	122	3,292	10.5	38.32
2015-19	41,080	337	1,404	2,316	3,720	106	3,615	11.1	42.62

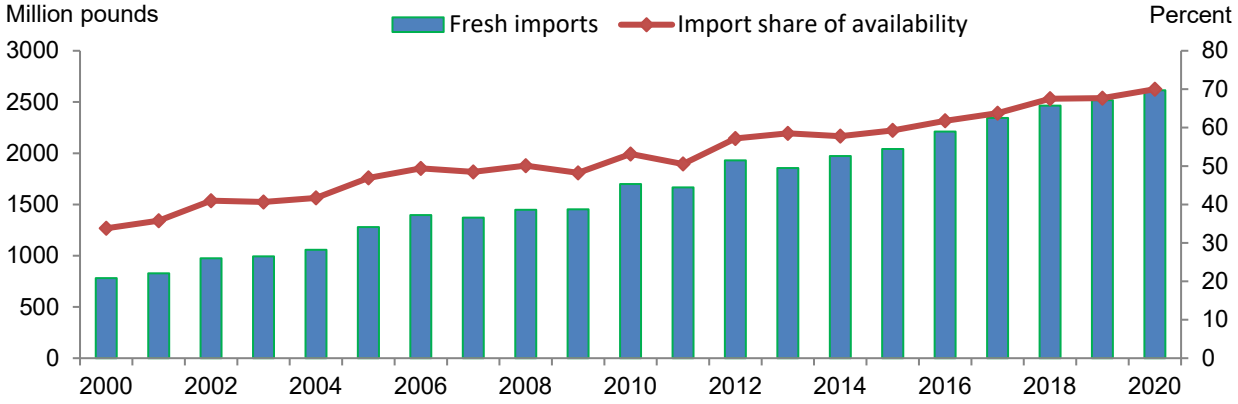
Note: Ac=acre, Cwt=hundredweight (100 lbs), -- = not available. Includes fresh and processing uses.

Source: USDA, Economic Research Service.

Import penetration in the U.S. bell pepper market has been steadily rising over the past 15 years (figure 3). In 2019, imports (fresh and processed) accounted for 68 percent of domestic availability, up from 58 percent in 2014 and 48 percent in 2009. Over the previous 5 years (2015-19), fresh and processed bell pepper imports each rose an average of about 5 percent annually.

Figure 3

U.S. bell pepper import volume and import share of availability, 2000-20



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

Imports of fresh bell peppers totaled 1.61 billion pounds in 2019 and are projected to increase 4 percent in 2020 despite the pandemic. Mexico remains the leading foreign source and year-round supplier, averaging 75 percent of annual volume during 2017-19. Canada, also a year-round supplier, provides about 18 percent of import volume. Greenhouse-produced bell peppers accounted for 53 percent of import volume during 2017-19 with Mexico (67 percent of the total), Canada (24 percent), and the Netherlands (5 percent) the top suppliers. Greenhouse share, which was 51 percent during 2010-12, has been slowly rising due partly to rising incomes,

concern over food safety and sustainability, and more competitive pricing for greenhouse products (which must compete with organically produced field grown products).

Fresh-Market Cucumbers

The fresh-market accounts for about one-fourth of all field-grown cucumbers produced in the United States. Per capita availability of all fresh cucumbers averaged 7.4 pounds during the 2010s—up 16 percent from the previous decade with the decade's gains spurred largely by the popularity of seedless varieties (table 4). Driven long-term by the enduring popularity of salads, fresh cucumber use been on an upward trend since the 1960s. The field-grown crop had an average annual farm value of $148 million during 2017-19. Florida is the leading supplier of fresh field-grown cucumbers; accounting for about one-third of annual utilized production. Florida is also the sole domestic supplier of field-grown cucumbers during late winter and early spring, with winter production very low since cucumbers are not tolerant of the cool spells common even in south Florida.

Table 4. Fresh cucumbers: U.S. supply and availability

Period	Area harvested	Yield per acre	Produc-tion	Imports	Total supply	Availability			Price
						Exports	Domestic	Per capita	
	1,000 ac	*Cwt/ac*	*Million lbs*					*Lbs*	*Dollars/cwt*
1970-74	46,552	96	448	166	614	15	599	2.9	8.37
1974-79	50,460	109	552	244	796	44	752	3.4	11.39
1980-84	54,884	125	687	355	1,042	55	987	4.2	13.82
1985-89	49,745	158	784	433	1,218	67	1,151	4.7	14.77
1990-94	51,239	177	900	452	1,353	81	1,272	4.9	17.75
1995-99	57,592	189	1,089	680	1,768	65	1,704	6.2	18.28
2000-04	54,196	191	1,032	855	1,887	54	1,834	6.4	19.76
2005-09	49,138	188	925	1,046	1,971	41	1,930	6.4	24.68
2010-14	39,328	194	765	1,471	2,235	35	2,200	7.0	25.16
2015-19	34,971	186	620	1,977	2,597	30	2,567	7.9	27.86

Note: Ac=acre, Cwt=hundredweight (100 lbs).

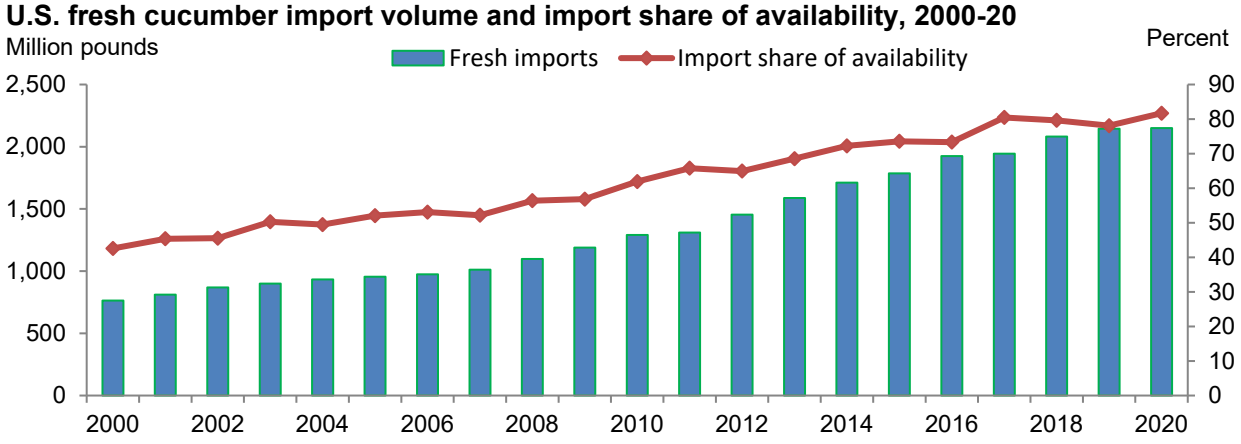
Source: USDA, Economic Research Service.

Cucumber consumption has climbed steadily since the 1960s, with consumption reaching 3 billion pounds in 1999. Per capita availability of cucumbers has risen during each of the past four decades, reaching 10.3 pounds in the 1990s. Some 60 percent of cucumbers are consumed in fresh form, mostly at home. The remaining 40 percent is consumed as pickled products, with one-third used in fast foods, largely reflecting sandwich use (e.g., hamburgers, subs, etc.) and associated condiment demand (relishes).

Domestic cucumber production for all uses totaled 1.5 billion pounds in 2019, with just under a third earmarked for the fresh market. Michigan and Florida are the leading cucumber states,

producing 42 percent of the nation's output during 2017-19, with Georgia and North Carolina following. During 2017-19, only about 1 percent of fresh-market volume was exported.

Figure 4
U.S. fresh cucumber import volume and import share of availability, 2000-20



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

U.S. production is supplemented by ever-rising imports, which now account for more than three-fourths of domestic consumption—up from less than one-half in 2000. Growers and shippers of fresh-market cucumbers sell less than 20 percent of their crop through foodservice venues.

According to the recently released 2019 Census of Horticulture, U.S. production of greenhouse cucumbers totaled 51.03 million pounds. This was down from 72.6 million pounds in the 2014 Census (likely reflecting stiff competition from Canadian and Mexican product) but up from 26.5 million pounds in 2009. Greenhouse production is now about 9 percent of U.S. domestic fresh cucumber production, down from 10 percent in 2014 but up from 3 percent in 2009.

Import penetration in U.S. fresh-market cucumbers has been rising strongly over the past 15 years (table 3). In 2019, imports accounted for 82 percent of domestic availability, up from 72 percent in 2014 and 57 percent in 2009. Over the previous 5 years (2015-19), fresh cucumber imports rose an average of about 5 percent annually (figure 4).

Imports of fresh cucumbers totaled 2.15 billion pounds in 2019 and are projected to increase slightly in 2020 despite the pandemic. Mexico remains the leading foreign source of fresh cucumbers, averaging 80 percent of annual volume during 2017-19. Canada, also a year-round supplier due to an extensive greenhouse industry, provided 16 percent of import volume during 2017-19. Greenhouse-produced cucumbers accounted for 18 percent of import volume during 2017-19, with Mexico (48 percent of the total) and Canada (49 percent) nearly splitting the market. Greenhouse share, which was 15 percent during 2010-12, has been slowly rising for many of the same reasons cited for bell peppers. However, consumers have also found favor

with the long, thin-skinned, homogeneous European seedless varieties frequently produced in both domestic and foreign greenhouses.

Fresh-Market Vegetables

Fresh Vegetable Markets Adjust to Pandemic

Following the initial demand surge in March and April when worried consumers rushed to fill pantries, the food marketing system quickly adjusted so that the vast majority of food could funnel through brick and mortar retailers and online grocers. Based on year-over-year comparison of fresh vegetable shipment volume (table 5), it appears that a tag team combination of increased retail sales, foodservice delivery, restaurant drive through/pickup, and various USDA programs (food boxes, free school lunch, etc.) have offset reductions in sit-down restaurant sales.

Table 5. Selected U.S. fresh-market vegetable shipments, January-November, 2018-20[1]

	2018		2019		2020		Change[2]	
Input	Domestic	Total	Domestic	Total	Domestic	Total	Domestic	Total
	Thousand hundredweight (cwt)						*Percent*	
Asparagus	334	5,192	263	5,041	216	5,102	-17.8	1.2
Snap beans	1,626	3,201	1,608	3,290	1,454	3,171	-9.6	-3.6
Broccoli	6,218	10,542	5,859	10,093	6,104	11,576	4.2	14.7
Cabbage	6,877	7,794	6,514	7,965	6,693	7,915	2.8	-0.6
Chinese cabbage	555	1,042	540	1,043	645	1,099	19.4	5.4
Carrots	8,758	11,341	9,158	11,316	9,374	12,302	2.4	8.7
Cauliflower	5,299	5,576	4,969	5,316	5,180	5,547	4.2	4.4
Celery	14,476	15,518	13,624	15,180	15,694	17,352	15.2	14.3
Sweet corn	10,193	11,534	8,527	9,778	7,487	8,931	-12.2	-8.7
Cucumbers	3,388	17,567	3,265	17,449	2,495	20,391	-23.6	16.9
Eggplant	695	2,418	774	2,450	603	2,351	-22.1	-4.0
Lettuce, head	24,064	25,202	23,277	25,219	22,360	24,412	-3.9	-3.2
Lettuce, romaine	19,737	20,478	19,528	20,379	18,938	19,658	-3.0	-3.5
Lettuce, green leaf	2,043	2,043	2,028	2,028	1,811	1,811	-10.7	-10.7
Onions, dry bulb	43,052	49,816	43,318	48,451	43,342	50,129	0.1	3.5
Onions, green	294	3,530	274	3,580	336	3,669	22.7	2.5
Peppers, bell	6,233	15,823	6,408	16,252	5,489	17,515	-14.3	7.8
Peppers, chile	215	11,189	389	10,671	184	10,761	-52.8	0.8
Spinach	1,447	1,613	1,332	1,656	1,097	1,469	-17.6	-11.3
Squash	1,595	10,434	1,740	11,261	1,284	10,601	-26.2	-5.9
Sweet potato, all	8,633	8,633	7,442	7,442	7,419	7,419	-0.3	-0.3
Tomato, round[3]	13,096	27,294	12,009	24,703	10,400	27,557	-13.4	11.6
Tomato, roma/plum[3]	3,151	14,870	3,276	16,239	3,298	17,594	0.7	8.3
Tomato, small [3,4]	1,538	3,517	1,550	3,761	1,238	3,450	-20.1	-8.3
Selected total	183,517	286,164	177,670	280,561	173,139	291,780	-2.5	4.0

Note: Jan.-Nov. represents year to date (YTD) totals. f=ERS forecast.

1/ 1,000 cwt = 100,000 lbs. Data for 2020 are preliminary. Imports are as reported by Market News and are not all inclusive.

2/ Change from YTD November 2019-20. 3/ Includes field-grown and protected culture. 4/ Grape and cherry tomatoes.

Source: USDA, Agricultural Marketing Service, *Fruit and Vegetable Market News.*

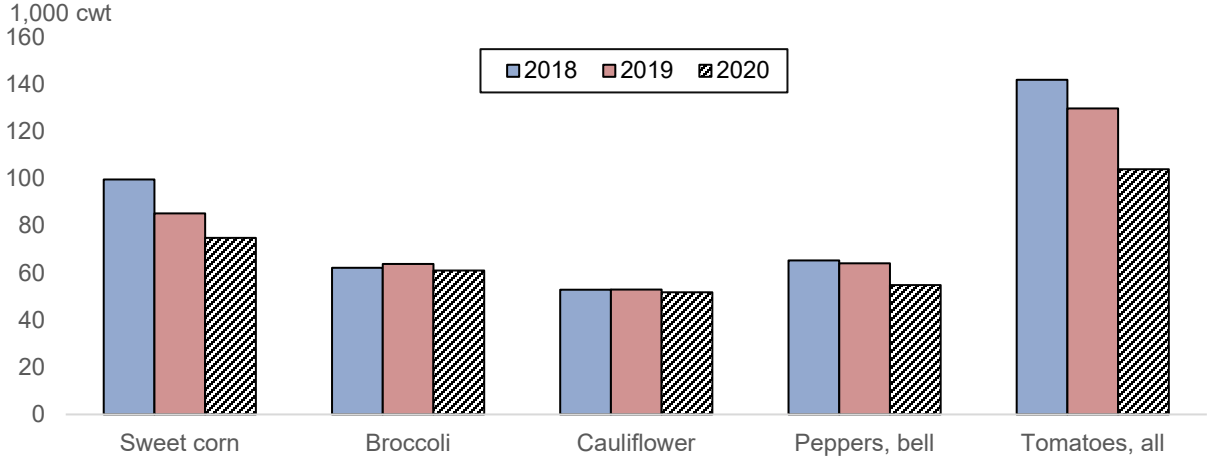
Retail demand for fresh vegetables packed in containers, bags, or overwrapped trays has been rising for several years and shippers and retailers have been responding by increasing these purchase options. This trend toward packaged/covered fresh vegetables was likely beneficial in supporting retail vegetable sales this year, especially among safety-wary consumers. The week-to-week volume of fresh market vegetables sold at retail has remained well above year-earlier levels since the early days of the pandemic. For most commodities, it appears that following initial field and in-transport losses caused by the abrupt pandemic-related closure of foodservice outlets in mid-March, aggregate fresh vegetable movement has been similar to a year earlier.

California Endures Brutal Summer

This was a summer that will not soon be forgotten for California vegetable growers. In addition to the pandemic and ongoing drought conditions, many growers endured periods of smoke-filled skies brought on by an unprecedented series of wildfires. Also, several days of scorching heat (with highs over 90 degrees) in normally cool coastal areas played havoc with quality and growth of cool season vegetables such as lettuce, broccoli, and cauliflower (figure 5).

Figure 5

Selected domestic fresh-market vegetable shipments, January to November, 2018-20[1]



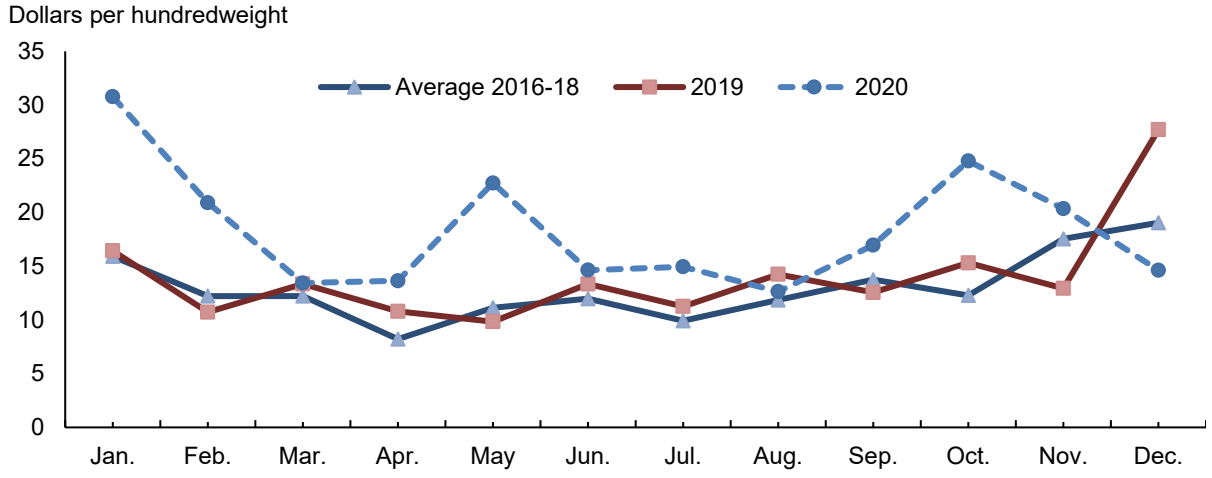
[1] Year-to-date total reported domestic shipments for January-November. Excludes imports.

Source: USDA, Economic Research Service using data from USDA, Agricultural Marketing Service, *Market News*.

Quality and growth of warm season crops such as tomatoes, eggplant, and peppers, which grow in the inland valleys of California, were also impacted by temperatures that exceeded 100 degrees in stretches. The majority of California's fresh market tomatoes are produced in the San Joaquin Valley where temperatures were above average this summer. Heat affects pollination of crops such as those in the nightshade horticultural group, resulting in delayed

growth and marketing and higher market prices. Tomato f.o.b. prices averaged 17 percent above a year earlier this summer and after peaking in October, declined through early December—averaging just 7 percent higher for the fall season (figure 6).

Figure 6
Shipping-point prices for fresh round field-grown tomatoes, average 2016-18, 2019-20



Source: USDA, Economic Research Service using data of USDA, Agricultural Marketing Service, *Market News*.

This year, growing degree days (using a 60-degree F base) were above normal across California including key vegetable production areas around Salinas, Oxnard, Sacramento, and Fresno. Normally, this would be an indication of advanced crop development rates (and the potential for bunching of harvests which can create a boom-bust price cycle). While some of this was noted in price movements, stretches of extreme high crop-stressing temperatures in most areas along with smoke-clouded skies in others provided a leveling offset to that impact.

The late fall/winter growing season also began on a hot note in the desert southwest of California and Arizona with temperatures frequently in the 90s in late October and early November. This is not unusual as early desert leafy vegetable volume and quality is frequently affected by October/November heat until temperatures cool down later in the month. Coastal California late October-early November lettuce volume was below average due to the earlier heat wave, which was followed by wet, cool conditions. Thus, reduced volume and the resulting higher prices were in play just as the annual transition to the desert late fall/winter areas began. These higher prices merged into the usual seasonal price increases experienced as the Thanksgiving demand pull began (table 6). Fresh leafy and cruciferous vegetable shipping-point prices then eased by early December as both desert supplies and consumer demand evened out.

Table 6. U.S. quarterly fresh-market vegetable f.o.b. prices, 2019-20[1]

Input	Carton size	2019 1st Q	2019 2nd Q	2019 3rd Q	2019 4th Q	2020 1st Q	2020 2nd Q	2020 3rd Q	2020 4th Q f	Change 4th Q [1]
		---------- Dollars per carton ----------								Percent
Artichokes	23-lb	26.27	22.61	17.86	21.17	13.76	18.49	21.67	21.25	0.4
Snap beans	30-lb	14.82	19.72	13.20	27.39	15.06	19.76	16.05	25.92	-5.4
Broccoli, crown-cut	20-lb	16.42	14.23	15.15	15.10	15.77	14.75	14.23	17.96	18.9
Cabbage, green	50-lb	19.59	15.77	9.02	9.74	8.69	12.09	11.40	13.25	36.1
Carrots, baby	48-1 lb	14.78	14.54	13.72	14.92	14.63	15.27	15.40	16.00	7.2
Cauliflower	25-lb	21.16	16.56	11.86	15.96	20.04	14.31	8.75	19.25	20.6
Celery	60-lb	40.00	61.88	10.09	14.91	10.30	10.11	12.06	10.75	-27.9
Sweet corn	42-lb	15.10	11.87	14.05	16.15	16.41	20.48	17.40	18.75	16.1
Cucumbers	55-lb	15.35	14.95	14.79	17.92	22.78	17.71	20.87	16.00	-10.7
Lettuce, head	50-lb	16.26	13.19	15.03	19.60	14.35	10.95	15.20	21.00	7.2
Lettuce, romaine	40-lb	11.38	13.83	16.84	20.53	10.17	11.36	23.36	26.00	26.6
Onions, dry bulb	50-lb	13.16	15.27	14.14	7.81	9.18	9.77	10.26	9.15	17.2
Peppers, bell	28-lb	21.07	18.15	13.74	12.67	19.63	22.58	16.78	15.50	22.4
Spinach	20-lb	17.67	14.13	13.25	15.85	14.19	15.86	15.88	17.75	12.0
Squash, summer	21-lb	11.72	9.27	10.11	9.24	19.42	11.68	12.86	9.00	-2.6
Sweet potato, all	40-lb	16.29	17.70	21.83	19.26	19.36	20.03	21.54	21.25	10.3
Tomato, field, round	25-lb	13.60	11.15	12.82	16.70	22.05	16.34	14.85	18.00	7.8
Tomato, field, roma/plum	25-lb	12.32	10.73	11.84	16.52	21.22	15.51	12.23	13.25	-19.8
All vegetables [2]	--	128.0	115.3	106.7	133.8	148.9	126.5	126.3	145.0	8.3

Note: Q = calendar quarter. Non-organic for all sizes and varieties. f = ERS forecast. 1/ Change in projected fourth quarter 2020 over fourth quarter 2019. 2/ Price index with base period of 2011 (the period when the index equaled 100).

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service and USDA, Agricultural Marketing Service, *Fruit and Vegetable Market News*.

Eta Adds Insult to Injury for Florida

On the east coast, Tropical Storm Eta hit Florida with torrential rains and high winds in the middle of the fall vegetable season. These are largely the same Florida (and South Georgia) growers and shippers who suffered losses when the pandemic struck in March with foodservice venues suddenly shuttered. Some growers anticipating the heavy Thanksgiving demand pull may have had challenges meeting retail demand due to flooded fields, damaged crops, and delayed harvests.

Damage from excess rain was noted for rain-sensitive crops such as squash and many newly planted fields which were underwater and required replanting. In general, planting schedules were in disarray as growers waited for flooded fields to dry out which may delay harvests and lead to supply gaps for many warm season crops such as squash, tomatoes, and peppers into the new year. This could also spur further increases in imported vegetables into 2021.

La Niña Is Back

As has been seen this past summer and fall, weather plays an important role in determining fresh vegetable quality and yield. The National Oceanic and Atmospheric Administration projects a moderate to strong La Niña weather pattern emerging this winter. In general, this

could be favorable news for weather-weary fresh-market vegetable growers since La Niña seasons usually bring drier, warmer winters to the Western and Southern states. These are the regions (the desert Southwest, Florida, South Texas) where the majority of domestic field-grown fresh market vegetables are produced. Domestic production in these regions is supplemented by imports, scattered (but ever-expanding) protected-culture suppliers, and storage supplies (e.g., potatoes, onions, cabbage, sweet potatoes, carrots). The downside to La Niña seasons is possible transportation headaches and demand impacts caused by heavier snowfall and extreme cold snaps in major Eastern/Northern population centers.

Winter Season Outlook Clouded by Pandemic

The outlook for market volume this winter remains clouded by the pandemic's influence. Despite the likely introduction of a vaccine this winter, it will take time for distribution and acceptance. Plus, although retail sales are expected to remain strong, cold weather may negatively affect restaurant sales simply by the attendant drop off in outside dining in most of the country. The specter of further restrictions on consumer activity is also in play in the event of increased virus activity during the cool winter months when flu and other viruses are more easily passed. Thus, given continued uncertainty in demand, growers likely remained cautious when planting for the winter harvest given the sizeable investment required to plant and produce an acre for the fresh market. Therefore, even with average weather and limited COVID-19 related restrictions, domestic shipments are expected to remain below the pre-pandemic levels of last winter.

For Florida winter-season growers, a sizeable portion of the vegetable crop has historically been geared toward the foodservice industry. This is especially true of tomato production which relies on a large restaurant base for demand. If COVID-19 flareups lead to lockdowns and restaurant closures this winter, Florida growers may face adversity for a third consecutive growing season.

Shipments Up, Prices Up

Excluding potatoes and mushrooms, shipments (domestic and imports) of the major fresh market vegetables rose 2 percent from a year earlier during January-November of 2020. Most of the increase in market volume was due to greater imports. Likely reflecting reduced area and adverse weather impacts, shipments from domestic producers declined for most fresh vegetables. Given the uncertainty caused by the pandemic, many domestic producers likely trimmed area planted during the spring and summer seasons. Wholesalers and retailers filled the resulting gaps in supply by increasing import volume—largely from Mexico and Canada.

In general, domestic f.o.b. prices for fresh field-grown vegetables are projected to average just above a year earlier during 2020. Lower average prices during January-June were outweighed by higher prices during the July-December period. Comparing the Producer Price Index (PPI) for all fresh vegetables (excluding potatoes) reported by the Bureau of Labor Statistics (which is computed using shipping-point prices) over the January through October period with a year earlier reveals fresh vegetable prices declined 1 percent from 2019. However, factoring in estimates for higher vegetable prices experienced during November and early December could place the annual PPI for fresh vegetables up about 1 percent from a year earlier.

Normally, the domestic vegetable price index computed by USDA's National Agricultural Statistics Service (NASS) would be utilized for determining the industry average price change here. However, NASS changed the data source for calculating the vegetable price index in February 2020 from prices at the point-of-first sale (which included grower level, f.o.b. shipping point, and other first buyers) to using only the f.o.b. shipping-point price. This may invalidate direct comparison of price indexes with previous years since the same index construction with prices from the f.o.b. level may be higher than an index that includes grower-level prices because the f.o.b. price includes several services which may not be included in a grower price.

After a rough first month following the beginning of the pandemic, demand for fresh market vegetables bounced back and has remained close to the average of the previous 3 years. Both volume and value of retail sales have averaged above a year earlier since March as homebound and COVID-19 wary consumers turned to home-cooked fare in place of at least part of their restaurant experience. This played an important part in keeping fresh vegetable shipments (domestic and import) near those of a year earlier. USDA's food box and free school lunch programs have also been important outlets for many vegetable growers.

Total vegetable shipments were buoyed despite the sharp reduction in foodservice sales. According to the Bureau of the Census, sales at food service and drinking places dropped 19 percent from a year earlier over the first 10 months of 2020. As one might expect based on closures and widespread seating/occupancy limits, sales performance was most severely curtailed in full-service venues. Meanwhile sales at establishments that offer drive-through and other low-contact options such as fast food declined much less. Home delivery, curbside pickup, mobile units, and ghost/dark kitchens have offered a lifeline for many distressed foodservice operations. Together with the familiar drive-through operations, these food purveying modes have helped keep the foodservice side of fresh-market vegetable demand alive.

Table 7. Fresh vegetables: U.S. Consumer and Producer Price Indices, 2019-20

Input	2019				2020				4th Q Change [1]	
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q f	Quarter	Year
	---------- Index ----------								Percent	
Consumer Price Indices (CPI, 1982-84=100)										
Food at home	242.0	241.8	241.4	241.9	244.1	253.5	252.1	251.0	-0.4	3.8
Food away from home	281.2	283.5	285.5	287.4	289.7	291.9	295.7	298.0	0.8	3.7
Fresh vegetables	343.3	335.4	334.8	334.9	343.2	344.7	347.2	347.0	-0.1	3.6
Potatoes	355.2	357.5	375.6	359.2	371.1	392.9	390.7	362.0	-7.3	0.8
Tomatoes, all	347.1	321.8	322.1	329.0	360.9	347.7	348.4	348.0	-0.1	5.8
Lettuce, all	324.7	314.3	317.1	332.9	328.4	323.5	327.8	355.0	8.3	6.6
Prepared salads [2]	126.5	125.2	125.6	130.2	133.3	128.5	127.9	131.0	2.5	0.6
Other vegetables	347.9	342.9	335.7	334.4	338.1	340.0	343.8	343.0	-0.2	2.6
Producer Price Indices (12/1991=100)										
Fresh vegetables (excluding potatoes) [3]	274.6	259.0	224.9	283.0	253.8	226.2	236.9	335.0	41.4	18.4
Beets	103.8	103.4	128.2	130.2	128.0	116.5	120.0	115.0	-4.2	-11.7
Broccoli	208.8	197.6	174.9	209.9	180.4	201.2	177.3	250.0	41.0	19.1
Cabbage [3]	449.3	318.3	243.0	216.5	183.4	273.2	286.3	358.0	25.0	65.4
Carrots [3]	178.1	180.1	183.0	207.3	191.5	182.7	194.3	200.0	2.9	-3.5
Cauliflower	127.4	103.0	65.8	131.6	109.7	83.3	45.7	105.0	129.8	-20.2
Celery [3]	791.8	1356.7	209.8	303.7	174.5	190.8	235.9	225.0	-4.6	-25.9
Cucumbers	--	184.3	277.8	245.5	--	210.7	308.3	235.0	-23.8	-4.3
Eggplant	412.0	280.6	306.3	223.3	216.6	421.6	437.4	365.0	-16.6	63.5
Greens	300.1	184.5	207.8	196.9	193.3	181.5	177.9	210.0	18.0	6.6
Lettuce [3]	290.2	231.2	298.9	458.3	274.4	200.5	274.9	500.0	81.9	9.1
Onions, dry bulb [3]	196.0	214.9	186.1	123.9	136.4	158.4	185.0	147.0	-20.5	18.6
Peppers, green/bell	447.3	392.0	264.9	276.3	470.4	461.0	392.2	395.0	0.7	43.0
Spinach	594.2	439.7	400.7	513.4	472.2	529.2	491.6	540.0	9.8	5.2
Squash	235.8	137.9	250.2	154.7	391.1	172.7	281.1	205.0	-27.1	32.5
Sweet potato	90.0	96.4	117.7	107.6	105.9	106.9	109.9	100.0	-9.0	-7.1
Sweet corn [3]	162.8	132.8	168.9	200.0	192.5	187.1	215.2	250.0	16.2	25.0
Tomatoes [3]	332.5	321.9	255.6	317.8	468.5	382.6	285.1	385.0	35.0	21.1

Note: Q = calendar quarter. f=ERS forecast. -- = not available. 1/ Change in projected fourth quarter 2020 from previous quarter/year.
2/ Index base is Dec 2007=100. 3/ Index base is 1982=100.

Source: USDA, Economic Research Service using data from U.S. Dept of Labor, Bureau of Labor Statistics.

Retail Prices Rise in Second Half of 2020

During 2020, the Consumer Price Index (CPI) for fresh vegetables is expected to rise nearly 3 percent from a year earlier (table 7). Despite the challenges, increased costs, and higher volume handled the retail industry due to the pandemic, fresh vegetable retail prices rose less than they did a year earlier (up 3.8 percent). This compares with a 3.5 percent increase in the all food CPI. If current end-of-year price expectations hold, unadjusted prices for at-home food will have increased slightly more than prices for away-from-home food—the first time that has occurred since 2011 and a further reflection on the pandemic's impact on the foodservice industry.

During the summer quarter (July-September) of 2020, shipping-point prices for fresh-market vegetables turned around from the spring doldrums fostered by the pandemic's impact on both

supply and demand. The warmth of summer allowed many foodservice establishments to offer outside dining as a supplement to takeout and curbside pickup for pandemic-weary consumers. The additional demand from the foodservice side combined with lower domestic supplies caused by acreage reductions and environmental issues (extreme heat, smoke-filled skies, tropical downpours) and caused summer quarter fresh market vegetable f.o.b. prices to move higher. As a result, consumer prices for fresh market vegetables (including potatoes) rose 4 percent this summer from a year earlier, led primarily by an 8 percent gain in fresh tomato prices. Retail prices for fresh tomatoes have been under pressure all year as a result of pandemic-reduced planted area, various weather issues in both domestic and Mexican production regions, and increased demand (table 8).

Table 8. Fresh vegetables: U.S. advertised retail prices, 2019-20

Input	2019				2020				4th Q Change [1]	
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q f	Quarter	Year
	Dollars/pound								*Percent*	
Asparagus, green	2.65	2.66	2.84	2.60	2.49	2.48	2.98	2.67	-10.4	2.7
Beans, snap	1.50	1.46	1.34	1.34	1.61	1.65	1.36	1.49	9.2	11.2
Beets	0.72	0.65	0.59	0.64	0.71	0.66	0.63	0.75	19.0	17.2
Bok choy	1.01	0.76	0.96	0.83	0.90	0.87	0.80	0.92	15.6	10.8
Broccoli, crown cut	2.40	1.70	1.64	1.57	2.42	1.57	1.59	1.61	1.0	2.5
Cabbage, green	0.62	0.57	0.59	0.58	0.56	0.55	0.57	0.61	8.0	5.2
Carrots, baby	1.28	1.24	1.23	1.27	1.19	1.23	1.23	1.20	-2.6	-5.5
Cauliflower	1.30	1.38	1.24	1.41	1.30	1.40	1.22	1.24	2.0	-12.1
Celery (each)	1.29	1.78	1.87	1.84	1.27	1.22	1.93	1.89	-2.3	2.7
Collard greens	1.87	1.82	1.90	1.73	1.82	1.96	1.91	1.85	-3.1	6.9
Corn, sweet (per ear)	0.47	0.38	0.41	0.53	0.50	0.42	0.44	0.45	1.9	-15.1
Cucumbers	1.17	0.99	1.04	1.08	1.58	1.04	1.17	1.03	-12.0	-4.6
Eggplant	1.32	1.36	1.37	1.26	1.26	1.44	1.32	1.23	-6.8	-2.4
Garlic	2.89	2.49	3.16	2.72	3.10	3.97	2.96	1.93	-34.8	-29.2
Lettuce, iceberg	1.52	1.55	1.74	1.82	1.71	1.83	1.91	1.80	-5.5	-1.1
Lettuce, romaine	1.52	1.46	1.49	1.96	1.38	1.27	1.37	2.06	50.8	5.1
Mushrooms, white button	2.70	2.54	2.54	2.65	2.67	2.62	2.67	3.12	16.9	17.7
Onions, dry bulb[2]	0.79	0.90	0.85	0.72	0.63	0.72	0.75	0.80	6.7	11.1
Peppers, green bell	1.60	1.45	1.36	2.41	1.46	1.77	1.46	2.52	73.1	4.6
Potato, table, russet	0.59	0.60	0.63	0.50	0.61	0.64	0.61	0.47	-23.7	-6.8
Radishes	1.52	1.57	1.39	1.50	1.35	1.53	1.75	1.71	-2.1	14.0
Spinach, flat baby	2.48	2.54	2.13	3.27	2.67	2.50	2.88	2.90	0.8	-11.3
Squash, zucchini	1.43	1.32	1.24	1.23	1.40	1.31	1.28	1.33	3.7	8.1
Sweet potatoes	0.91	0.97	1.04	0.89	0.92	0.98	1.00	0.86	-13.6	-3.4
Tomatoes, round field	1.41	1.49	1.50	1.41	1.74	1.59	1.62	1.70	4.4	20.5
Tomatoes, roma/plum field	1.07	0.99	1.09	1.11	1.16	1.09	1.10	1.17	6.7	5.4

Note: Q = calendar quarter. Data exclude organic. f=ERS forecast. 1/ Change in projected fourth quarter 2020 from previous quarter/year.

2/ Price per pound based on a 3-lb bag.

Source: USDA, Economic Research Service using data from USDA, Agricultural Marketing Service, *Market News.*

During the fall quarter, fresh vegetable demand uncertainties began to increase as cooler weather began to close off outdoor dining options, while rising COVID-19 infections prompted many states to reimpose restrictions on in-person restaurant dining. At the same time, this softening of demand was met with weather-reduced domestic supplies in both western and eastern growing regions. This resulted in a 5 percent rise in the fresh-market vegetable consumer price index from year-earlier levels. Although higher retail prices for tomatoes (up 11

percent) remained a key determinant in the fresh vegetable retail price index, reduced yields pushed retail lettuce prices up 8 percent from fall 2019. Following potatoes, tomatoes and lettuce are the two most heavily weighted items in the CPI for fresh vegetables.

Through November, about 60 percent of average advertised retail prices for 26 selected fresh-market vegetables registered increases during 2020. Cucumbers (up 34 percent, roma tomatoes (up 28 percent), garlic (up 26 percent), and round, field-grown tomatoes (up 21 percent) have registered the greatest year-over-year gains. On the opposite end, celery (down 15 percent), bok choy (down 13 percent), dry-bulb onions (down 9 percent) exhibited the greatest reductions in advertised price. Most of these large swings were reflections of unusual weather impacts (e.g., celery in 2019, lettuce and tomatoes in fall 2020), but others such as garlic reflected a heavier retail demand caused by the pandemic.

In the case of garlic, it is surmised that the sudden increase in at-home meal preparation prompted households that rarely engage in home cooking (as well as those who do) to purchase spices and flavoring agents (such as garlic), creating an unexpected run on supplies near the close of the marketing year. This also resulted in a 7 percent gain in fresh garlic imports. Since garlic harvest begins in June, the jump in demand exhausted supplies and sent prices upward (table 5). Demand remains strong and garlic prices this fall are running well above a year earlier as consumers purchase their flavoring agents for holiday meal preparation.

Fresh Imports Up, Exports Down

During the January through October period of 2020, the volume of fresh vegetable (excluding potatoes and mushrooms) exports declined 3 percent from a year earlier (table 9). Much of the reduction occurred during March, April, and June and was partly the result of pandemic-related transportation bottlenecks. In value terms, fresh exports totaled $1.9 billion with declines noted in trade with Canada (down 4 percent), Japan (down 26 percent), and Taiwan (down 16 percent). Through October, export volume was lower for most major commodities, including tomatoes, iceberg lettuce, dry bulb onions, and bell peppers.

Fresh vegetable import volume began 2020 on the same upward trajectory it has been on for decades, with January (up 4 percent) and February (up 5 percent) both registering gains over the average of the previous three years (2017-19). However, widespread media reports of the COVID-19 virus in late January and early February affected fresh vegetable import volume by March when volume fell slightly from the average of the previous three years.

Table 9. Selected fresh-market vegetable trade volume, 2018-20[1]

Item	2019 Annual	January-October 2017	January-October 2018	January-October 2019	January-October 2020	Change 2019-20
			Million pounds			*Percent*
Imports, fresh:						
Tomatoes, all	4,023	3,270	3,477	3,406	3,399	0
Cucumbers	2,145	1,560	1,681	1,761	1,773	1
Peppers, bell	1,613	1,207	1,287	1,346	1,394	4
Squash[2]	1,206	826	867	937	930	-1
Peppers, chile	957	780	820	801	783	-2
Lettuce, all	789	508	503	652	638	-2
Asparagus	572	429	485	489	503	3
Carrots	504	371	406	407	385	-5
Broccoli	493	397	328	395	411	4
Other	4,370	3,173	3,397	3,583	4,139	15
Subtotal	**16,671**	**12,520**	**13,250**	**13,777**	**13,944**	**1**
Mushrooms	169	109	122	137	147	7
Potatoes, excl seed	763	764	757	590	736	25
Sweet potatoes	25	19	23	22	17	-21
Total	**17,628**	**13,413**	**14,153**	**14,526**	**14,845**	**2**
Exports, fresh:						
Onions, dry bulb	810	538	534	636	595	-6
Lettuce, excl head	480	377	379	398	393	-1
Lettuce, head	243	217	219	206	200	-3
Cauliflower	243	198	234	192	202	5
Carrots	207	177	187	179	181	2
Tomatoes, all	173	159	151	143	119	-17
Sweet corn	126	143	140	119	126	6
Peppers, bell	104	88	86	83	79	-5
Spinach	96	67	70	81	86	6
Other	1,101	957	958	901	876	-3
Subtotal	**3,582**	**2,920**	**2,957**	**2,937**	**2,856**	-3
Mushrooms	17	9	15	15	14	0
Potatoes	1,140	939	864	1,009	895	-11
Sweet potatoes	571	528	549	464	496	7
Total	**5,311**	**4,396**	**4,385**	**4,425**	**4,262**	**-4**

[1]Excludes melons and dry pulses. [2]Includes chayote.

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

Following the mid-March shutdown of much of the economy, April fresh import volume dropped 10 percent from the 3-year average on the collapse of foodservice and institutional demand (figure 7). However, once strong retail demand emerged and the market adjusted, imports again resumed their upward trend, averaging a 13 percent monthly gain over the 3-year average between May and September.

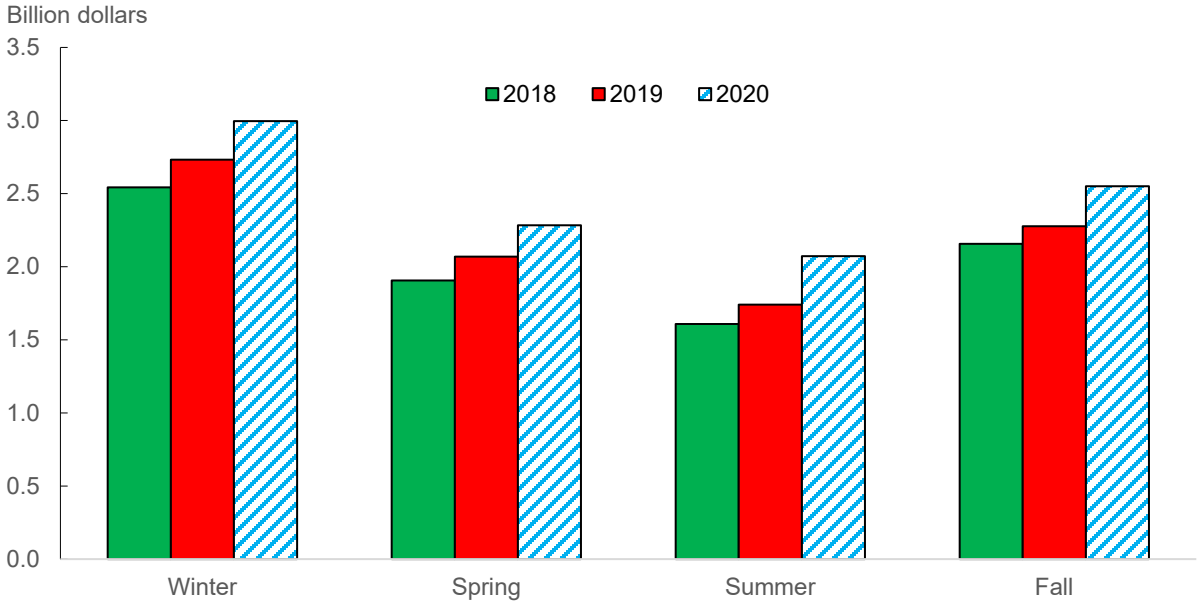
Despite the sizeable decline in April, the volume of fresh vegetable (excluding potatoes and dry pulse crops) imports increased 1 percent from a year earlier and was 6 percent above the 2017-19 average during the January through October period of 2020. The value of those imports totaled $8.1 billion with the top three sources, Mexico (up 14 percent), Canada (up 15 percent),

and Peru (up 5 percent), each registering year-over-year gains. The value of fresh imports from China (largely consisting of garlic) were down 20 percent through October. Together, Mexico and Canada accounted for 90 percent of U.S. fresh-market vegetable import volume during this period, up slightly from a decade earlier (89 percent). Through October, import volume is mixed among the major commodities, with increases for bell peppers, broccoli, and asparagus and declines for carrots, lettuce, and chile peppers.

In 2019, with rising imports and lower domestic output, the fresh vegetable (excluding potatoes and mushrooms) import share of availability reached a record high of nearly 32 percent—up from 21 percent a decade earlier. Given the continuing gains experienced in import volume this year in spite of the unsettled nature of the market, import share is projected to continue rising, further challenging domestic producers.

Figure 7

Value of quarterly fresh-market vegetable imports, 2018-20[1]



[1] Fall 2020 is projected by ERS. Excludes potatoes. Winter=Jan.-Mar, Spring=Apr.-June, Summer=July-Sept., Fall=Oct.-Dec.

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

Processing Vegetables

California Tomato Crop Up Despite Challenges

With a 1-percent increase in contract area expected to be joined by a slight gain in yield per acre, contract production of California processing tomatoes was estimated to total 11.4 million short tons (table 10). However, according to the California Processing Tomato Advisory Board (PTAB), the crop came in at 11.3 million tons. The processing season began in early July and was complete by late October. Although this year's crop is down from earlier intentions, it is up 1 percent from a year earlier and about equal to the 2017-19 average output (figure 8). Tomatoes were expected to be harvested from a contract area of 230,000 acres, down from the earlier forecast of 235,000 acres. According to PTAB, within the 11.3 million tons, 526 thousand tons (4.7 percent of the 2020 crop) was produced organically, up 30 percent from a year earlier and the second highest (2016 was the highest at 737 thousand tons) over the past 7 years.

As with a year earlier, California's processing tomato yield fell below trend expectations. Although short of expectations, yield managed to exceed that of a year earlier despite facing several adversities. Fields experienced bouts with plant-stressing unusually hot weather at the start and end of the season. Pest pressures were also reported to be a negative factor on yield this season along with the usual limitations in State and Federal water allocations (20 percent) and periods of smoke-reduced sunlight in areas of the state downwind from severe wildfires. Additionally, a shortage of drivers for tomato delivery trucks was noted (possibly COVID-19 related).

Table 10. California production of processing tomatoes

Year	Harvested acres	Yield	Utilized production	Price[1]	Value
	Thousand acres	*Tons/acre*	*Thousand tons*	*Dollars/ton*	*Million dollars*
2000-04	274.2	37.1	10,181.3	57.49	585.4
2005-09	285.8	39.8	11,384.4	73.05	831.6
2010-14	265.4	47.5	12,597.6	82.06	1,033.8
2015-19	248.0	49.2	12,188.4	84.34	1,028.0
2015	296.0	48.5	14,361.0	93.00	1,335.6
2016	258.0	49.0	12,647.0	86.30	1,091.4
2017	222.0	47.1	10,464.0	81.00	847.6
2018	236.0	52.1	12,284.0	79.00	970.4
2019	228.0	49.1	11,186.0	80.00	894.9
2020p	230.0	49.6	11,400.0	83.00	946.2

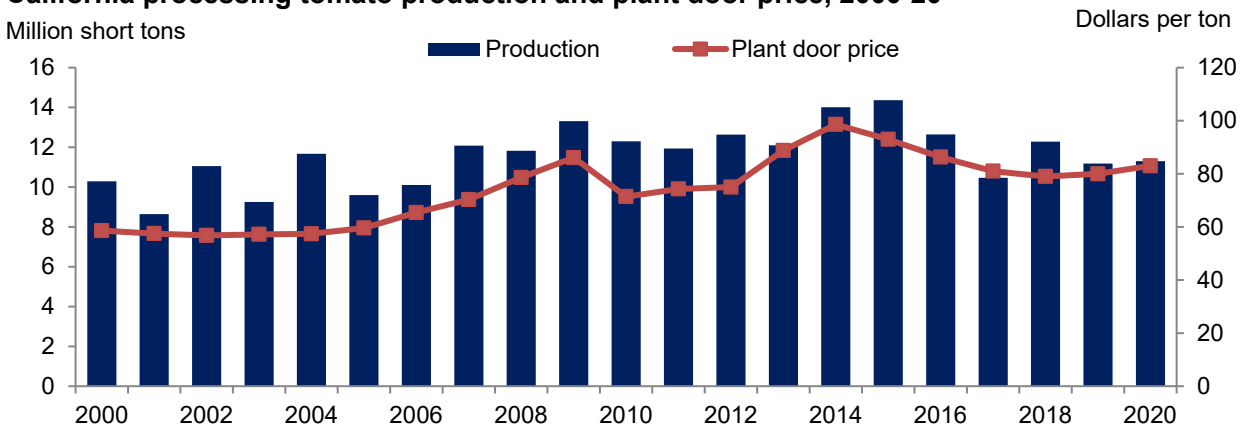
Note: Tons are expressed as short (2,000 lb) tons. p=preliminary.

[1] Price at the processing plant door. 2020 price is projected by ERS.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Figure 8

California processing tomato production and plant door price, 2000-20



Note: Ton is a 2,000 pound short ton. Production for 2020 is preliminary and price is an ERS forecast.

Source: USDA, Economic Research Service using data of Processing Tomato Advisory Board and USDA, National Agricultural Statistics Service.

but it is unknown if any fields were bypassed or suffered quality issues (and rejection by processors) due to delayed harvest. Most rejected loads were likely related to heat and pest/mold issues. Although pandemic mitigation costs likely added to expenses for both growers and processors, few other discernable impacts on raw tomato output can be directly ascribed to COVID-19.

In addition to the California crop, another 0.5 to 0.6 million tons of processing tomatoes are produced in other States. No official estimates are available for these States as they were dropped from the crop estimates program by the National Agricultural Statistics Service after the 2018 season for budgetary reasons. The majority of these tomatoes are produced in Indiana, Ohio, Michigan, and Pennsylvania.

The outlook for 2020/21 remains clouded by the continuing impact of the pandemic on domestic and foreign consumer behavior. Improved tomato product movement at retail has offset reductions in foodservice demand but industry export volume is running below a year earlier. Inventories coming into the 2020/21 season were down 15 percent from a year earlier and were the lowest in several years. The industry (and all of California agriculture) is also concerned with the specter of drought and the irrigation water situation. With most key reservoir levels currently below the 15-year historical average and groundwater a fragile and uncertain resource (groundwater provides 40 percent of the state's water supply in normal years and up to 60 percent in dry years), an above average snowpack will be on agriculture's wish list this winter. Despite the continued reign of market uncertainty and prospects for continued sluggish export markets, a combination of shrinking inventories, higher paste prices, and the likelihood of a

foodservice industry recovery during the 2021/22 marketing season could spur a modest increase in tomato contract intentions in 2021.

Price Negotiations Stretch into Fall

According to the California Tomato Growers Association (CTGA), the final 2020 base price (price at the first delivery point, excluding premiums) has yet to be finalized with all 9 processors. Eight of the nine processors agreed to accept $78.50 per short ton (unadjusted for inflation), up from $75 the previous season. However, as of this writing, the CTGA and 1 remaining processor were headed to conciliation for final settlement.

Given the contentious nature of price negotiations in 2020 and the likelihood of similar market forces in 2021, growers and processors may be equally hard-pressed to quickly come to agreement in the coming year. It appears the 2021 raw tomato base price will experience some upward pressure based on industry stock levels, an under-budget 2020 crop, and expectations about the initial CTGA price position which consider rising input costs, higher paste prices, and an apparent slowdown in yield trends. However, downward pressure may come from stronger export competition (larger world output in 2020), the relatively strong dollar, and potentially sluggish foodservice demand during the cooler months of the 2020/21 market year.

Table 11. Processed vegetables: U.S. Consumer and Producer Price Indices, 2019-20[1]

Input	2019				2020				4th Q Change[2]	
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q f	Quarter	Year
	Index								*Percent*	
Consumer Price Indexes (12/97=100)										
Processed fruits and vegetables	155.8	157.1	156.7	155.2	157.1	163.5	164.0	161.4	-1.6	4.0
Canned vegetables	172.2	175.5	174.5	170.7	173.2	181.9	182.0	178.5	-1.9	4.6
Frozen vegetables (1982-84=100)	197.0	200.3	200.5	198.1	201.3	209.2	208.8	206.0	-1.3	4.0
Dry beans, peas, lentils	179.2	180.4	180.8	183.4	182.5	191.6	195.9	187.0	-4.5	2.0
Olives, pickles, relishes	--	141.4	141.1	142.3	146.8	147.0	148.0	149.7	1.1	5.2
Producer Price Indexes (1982=100)										
Canned vegetables and juices	176.6	175.6	177.0	180.3	183.1	184.4	183.9	186.5	1.4	3.4
Tomato catsup and sauces[3]	157.6	158.2	158.6	160.6	161.1	160.5	160.1	162.3	1.4	1.0
Other canned vegetables[3]	192.7	188.7	192.2	196.9	204.5	209.5	209.0	211.8	1.4	7.6
Vegetable juices[3]	145.8	145.1	145.6	151.1	--	--	--	--	--	--
Pickles and products	241.9	241.6	241.1	241.1	241.1	241.6	242.0	242.3	0.1	0.5
Canned dry beans	171.4	170.8	172.7	173.6	173.0	173.5	172.9	174.2	0.8	0.3
Frozen vegetables (excl potatoes)[4]	150.2	150.7	153.4	155.7	156.2	156.4	157.6	157.7	0.0	1.3
Frozen vegetables (incl potatoes)	211.9	212.1	213.8	215.4	216.2	216.3	217.1	217.2	0.0	0.8
Frozen potato products[4]	208.0	208.0	208.1	208.7	209.5	209.5	209.5	209.5	0.0	0.4
Dried/dehy. fruit & vegetables	238.5	238.8	237.7	237.7	239.1	247.8	249.2	252.0	1.1	6.0

Note: f=ERS forecast. -- =not available. Q=calendar quarter. 1/ Not seasonally adjusted.

2/ Change in projected fourth quarter 2020 from previous quarter/year. 3/ Index base is 1987=100. 4/ Index base is 1990=100.

Source: USDA, Economic Research Service using data from U.S. Dept of Labor, Bureau of Labor Statistics.

Given these offsets and barring sustained improvement in tomato product movement this winter, continued market uncertainty appears likely through the end of the 2020/21 market year and points to the possibility of another year of unusually contentious price negotiations.

Given a smaller-than-expected 2020 tomato crop and low beginning stocks, it is likely that wholesale prices will remain above year-earlier levels for most tomato products into next summer (table 11). Since the start of the marketing year in July, spot wholesale prices for 31-percent industrial tomato paste have risen from 38 cents to 40 cents per pound. Nominal dollar tomato paste prices are running 8 percent above a year earlier and are the highest since 2015. In the past, sustained prices at this level have been indicative of impending increases in contract output.

Global Tomato Production Estimated Higher

According to the World Processing Tomato Council, the preliminary estimate for 2020 global production of tomatoes used to make processed products increased 3 percent to 42.5 million short tons. This gain occurred despite lower-than-expected output in the United States, the top global producer with 28 percent of the 2020 crop. In China, preliminary estimates indicate the processing tomato crop will be up about one-fourth from a year earlier at 6.4 million short tons. China was the second leading global producer in 2020, with the majority of the crop produced in Xinjiang, where yields were reported to be favorable. Italy rounds out the top three producers and expects a crop of 5.7 million short tons (13 percent of global output), up 8 percent from the 2019 crop.

Processing Vegetable Exports Down, Imports Up

Based on data for January through October, the value of U.S. processed vegetable exports (canned, frozen dried/dehydrated, juice) declined 12 percent from a year earlier to $2.9 billion while import value rose 4 percent to $4.1 billion. Each of the top 3 trading partners increased shipments to the United States led by Canada (up 4 percent), Mexico (up 9 percent), and China (up 21 percent). Half of processed imports consisted of frozen vegetables, with 42 percent of these (largely frozen potato products) entering from Canada. Shelf-stable vegetables (prepared/preserved) accounted for 36 percent of processed vegetable import value, with Mexico (16 percent), Canada (12 percent), and Italy (12 percent) the top sources.

On the export side, most of the decline was in reduced exports to the leading market, Canada (down 9 percent). With the exception of dried/dehydrated products, the value of processed

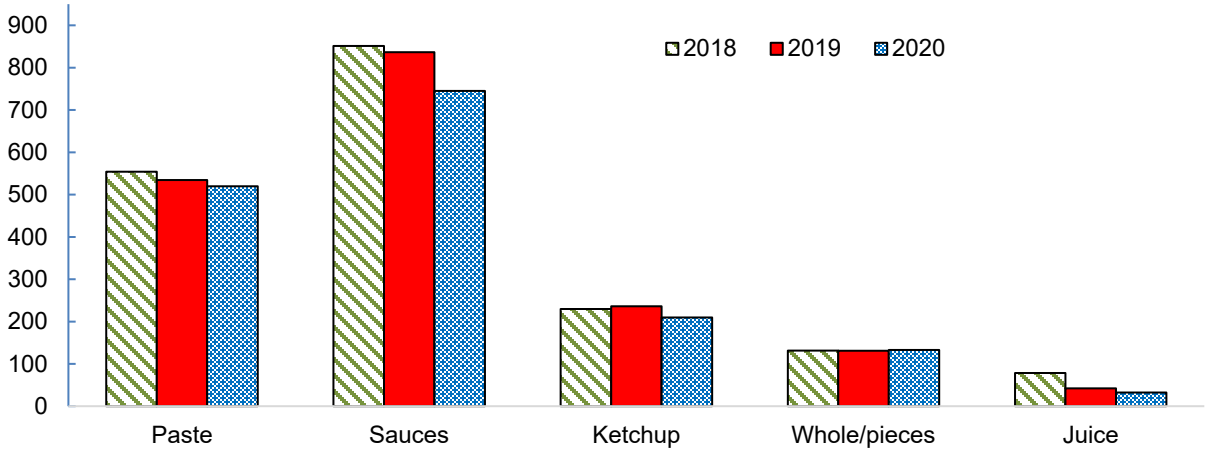
vegetable exports to Canada were lower for each of the major subgroups. The value of dried and dehydrated vegetable exports (excluding pulse crops) rose 3 percent led by mixed dried/dehydrated vegetables (up 11 percent) and dried onions (up 8 percent). The value of processed vegetable exports to Japan, the second leading market, declined 5 percent led by a 7-percent drop in frozen products (largely french fries) and an 8 percent reduction in shelf-stable (canned) products. Exports of dried and dehydrated vegetables to Japan rose 8 percent with potato flakes (up 23 percent) and dried onions (up 24 percent) leading the way. Exports of dried vegetables occurred in the 2-3 months after the pandemic began perhaps reflecting concern by industrial users that export markets might be hampered to the point that these products would be difficult to receive.

In terms of volume, shelf stable (largely canned) vegetable exports were running behind year earlier volume for each of the top 3 markets with exports to Canada (down 8 percent), Mexico (down 4 percent), and Japan (down 8 percent). Notably, U.S. canned exports to Saudi Arabia, the fourth leading market in 2020, were down 22 percent driven by a 15 percent drop in tomato sauce. Through October, tomato products continued to dominate the top 3 canned export products led by sauces, paste, and ketchup (figure 9). Exports of each of these products were running below a year earlier and given rising world supplies, higher U.S. prices, and a relatively strong (although weakening) dollar, exports are expected to remain under pressure into 2021.

Figure 9

Volume of selected processed tomato exports, January-October, 2018-20

Million pounds



[1] Sauces include purees.

Source: Compiled by USDA, Economic Research Service from data of U.S. Dept of Commerce, Bureau of the Census.

The volume of frozen vegetable exports plummeted 18 percent from a year earlier during the January-October period. The majority of this decline can be explained by a drop in frozen french fries (down 20 percent) and other frozen potato products (down 8 percent). Exports of frozen fries are driven largely by global foodservice demand (particularly by quick service restaurants) and account for nearly three-fourths of annual U.S. frozen vegetable export volume. The pandemic has been particularly tough on foodservice sales on which french fries account for the vast majority of domestic and export movement. The top three nations comprise more than half of U.S. frozen vegetable exports. Although frozen exports to Mexico (the second-leading nation) were up 3 percent in 2020, volume was lower for top market Japan (down 7 percent) and Canada (down 18 percent).

Although the value was up 2 percent, the volume of dried and dehydrated vegetable (excludes pulse crops) exports rose 8 percent from a year earlier through October (table 12). However, most of the gain is from temporary surges in demand largely driven by pandemic-inspired purchases. For example, movement to the top 3 traditional markets was down 8 percent through October, with dried/dehydrated exports down 16 percent to Canada, 8 percent lower to Mexico, but 3 percent higher in the third-leading market, Japan. Notably, U.S. dried/dehydrated exports to China, the fourth-leading market, accounted for most of the total gain in the U.S. global total—leaping 548 percent, driven mostly by mixtures of dried and dehydrated vegetables. Most of this gain occurred in August and was likely a one-time purchase reflecting an industrial need.

Table 12. Selected processed vegetable trade value, 2017-20

Item	2019 Annual	January - October 2017	2018	2019	2020	Change 2019-20
	Million dollars					*Percent*
Imports						
Canned vegetables	1,526	1,269	1,293	1,295	1,447	12
Tomatoes	232	155	175	189	250	32
Artichokes	139	121	114	113	101	-11
Peppers, all	113	97	105	92	92	-1
Mushrooms	115	91	92	97	96	-1
Juices (including tomato)	68	34	61	58	51	-11
Frozen vegetables	2,345	1,687	1,913	1,944	2,133	10
Potatoes	969	718	803	799	880	10
Broccoli	360	242	295	304	320	5
Cauliflower	80	47	53	64	76	18
Dried and dehydrated	748	604	653	634	542	-15
Starches	212	135	170	177	141	-20
Potato flakes and granules	147	122	140	125	113	-9
Potato chips	102	63	75	86	75	-12
Garlic, dried/dehydrated	22	52	33	19	17	-10
Selected total imports	**4,619**	**3,559**	**3,858**	**3,873**	**4,121**	**6**
Exports						
Canned vegetables	1,785	1,551	1,509	1,498	1,359	-9
Tomatoes	1,247	1,065	1,026	1,038	967	-7
Sweet corn	96	93	91	82	71	-13
Cucumbers	71	64	66	63	38	-39
Juices (including tomato)	40	51	49	34	33	-3
Frozen vegetables	1,583	1,284	1,252	1,316	1,075	-18
Potatoes	1,251	980	961	1,037	830	-20
Sweet corn	102	86	87	89	79	-11
Dried and dehydrated	504	440	408	418	426	2
Potato chips	185	165	158	153	154	1
Potatoes, dried/dehydrated	141	94	93	116	112	-3
Onions, dehydrated	79	66	68	66	69	5
Selected total exports	**3,873**	**3,275**	**3,168**	**3,232**	**2,859**	**-12**

Note: Potato chips were grouped with dried and dehydrated for the purposes of this table. Excludes soybeans.

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

Frozen Stocks Up 4 Percent in October

According to the NASS *Cold Storage* report for October, frozen vegetable stocks (including potatoes) were up from a month earlier 4 percent above a year ago (table 13). With stronger retail demand offsetting reduced foodservice sales, frozen vegetable stocks registered few unusual movements during the year. Although record low stocks were recorded for lima beans and french-style green beans in October, these were most likely reflective of long-term downward trends in demand for these vegetable packs.

Table 13. Frozen vegetables: U.S. cold storage holdings during initial month of the quarter, 2019-20[1]

Input	2019				2020				Change previous:[2]	
	January	April	July	October	January	April	July	October	July	Year
	Thousand pounds								*Percent*	
Asparagus	7,694	5,714	7,297	6,344	5,936	4,298	7,666	5,937	-22.6	-6.4
Lima beans	34,443	18,879	11,091	39,771	30,762	21,005	11,083	26,908	142.8	-32.3
Snap beans	156,582	121,611	141,796	205,362	157,106	103,693	136,842	254,126	85.7	23.7
Broccoli	63,250	76,705	82,456	85,859	75,586	82,128	75,905	77,107	1.6	-10.2
Brussels sprouts	15,728	13,341	12,930	12,982	13,256	9,172	10,118	9,550	-5.6	-26.4
Carrots	220,326	182,744	141,737	199,854	262,482	199,297	139,801	195,669	40.0	-2.1
Cauliflower	28,000	23,981	19,682	21,973	26,212	28,132	28,570	31,998	12.0	45.6
Sweet corn, cut	433,018	295,948	250,720	674,400	510,508	372,483	261,628	690,936	164.1	2.5
Sweet corn, cob	242,621	169,151	137,583	345,723	246,556	177,364	128,561	316,594	146.3	-8.4
Mixed vegetables	60,231	63,707	62,213	58,664	52,790	54,632	54,875	52,296	-4.7	-10.9
Okra	37,915	16,652	43,014	57,568	43,036	25,797	39,287	41,334	5.2	-28.2
Onions, all	69,721	82,588	77,280	67,368	67,871	92,375	77,129	74,413	-3.5	10.5
Blackeye peas	1,497	1,495	1,615	1,904	1,187	1,499	1,589	1,415	-11.0	-25.7
Green peas	188,769	132,510	385,001	277,596	185,946	112,569	341,429	281,524	-17.5	1.4
Southern greens	11,889	9,976	15,254	14,583	10,403	10,524	14,533	16,106	10.8	10.4
Spinach	30,847	34,603	39,444	32,030	35,144	43,320	53,806	44,542	-17.2	39.1
Squash	55,342	48,370	37,843	55,609	53,090	39,749	34,347	58,821	71.3	5.8
Other vegetables	535,862	440,646	354,953	458,115	406,680	381,515	363,933	517,389	42.2	12.9
Potatoes, french fries	1,030,263	969,089	907,021	942,518	990,553	975,074	867,817	1,022,623	17.8	8.5
Potatoes, other frozen	234,970	242,123	227,235	228,186	210,687	217,686	219,902	219,050	-0.4	-4.0
Total	3,458,968	2,949,833	2,956,165	3,786,409	3,385,791	2,952,312	2,868,821	3,938,338	37.3	4.0

1/ Reported stocks in cold storage during the first month of the calendar quarter. 2/ Percentage change in October stocks from July and the previous October.

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

However, two record highs were also noted in October for sweet corn (cut from the cob) and onions (other than onion rings). The highs for onions may reflect greater availability this year with favorable yields for onions in several areas and strong demand from food processors realizing strong retail demand for frozen meal preparations. Similarly, record stocks for cut corn likely reflects good retail and food manufacturing demand. This may be a bit of good news for sweet corn processors, considering that since per capita availability peaked in the 1990s, consumer demand for frozen sweet corn has slackened, with average domestic per capita availability down 16 percent between the 1990s and the 2010s.

Mushrooms

Sales Value and Prices Up, Volume Continues Down

USDA's National Agricultural Statistics Service (NASS) reported the 2019/20 season (July-June) farm value of all mushrooms (Agaricus and specialty), increase of 3 percent to $1.15 billion. The rise in mushroom farm value is mostly attributed to increases in both white-button and brown mushroom varieties. White and brown mushrooms accounted for 98 percent of all mushroom sales in 2019/20 season with white-button sales of 74 percent of total mushroom sales alone. Sales value for white mushrooms climbed 4 percent from the previous year to $789.7 million due to a 9-cent increase in the season-average price (point of first sale) from $1.21 per pound in 2018/19 to $1.30 per pound in 2019/20. Similarly, the sales value of brown mushrooms has also increased by 4 percent from the previous year (table 14).

Table 14: Mushrooms sales volume, price, and sales value

	Volume of Sales		Price		Value of Sales	
Item	2018/19	2019/20	2018/19	2019/20	2018/19	2019/20
	---- Thousand pounds ----		--- Dollars per pound ---		---- Thousand dollars ----	
Agaricus	**812,469**	**796,362**	**1.29**	**1.36**	**1,048,459**	**1,085,850**
White	628,695	607,659	1.21	1.30	762,926	789,711
Brown[1]	183,774	188,703	1.55	1.57	285,533	296,139
All Specialty	**19,255**	**20,005**	**3.44**	**3.37**	**66,251**	**67,446**
Shitake	6,726	7,013	3.20	3.44	21,515	24,091
Oyster	8,623	8,517	3.10	2.70	26,695	23,032
Other	3,906	4,475	4.62	4.54	18,041	20,323
Total	**831,724**	**816,367**	**1.34**	**1.41**	**1,114,710**	**1,153,296**

[1]Includes Portobella and Cremini.

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

Divergent Agaricus and Specialty Mushroom Prices

The 2019/20 season price of all mushrooms (Agaricus and specialty) has trended upward of 5 percent from $1.34 to $1.41 per pound in 2019/20 from the previous year. The increase in Agaricus mushroom prices have increased 6 percent while specialty mushroom prices have declined by 2 percent from last year (table 14). The NASS reported divergent price trends of specialty mushroom and Agaricus prices are also consistent with reports from the mushroom industry.

Reports from the mushroom industry attribute the decline in specialty mushroom prices and the increase in Agaricus mushroom prices to changes in consumer demand and higher grower costs. Despite State price differences, reports from the mushroom industry overall cite foodservice demand declines from restaurants closing which traditionally have greater demand for specialty mushrooms. While the most common mushroom varieties (Agaricus) have experienced increasing demand at supermarket retailers and farmers markets as consumers shift their consumption away from restaurants during the coronavirus pandemic.

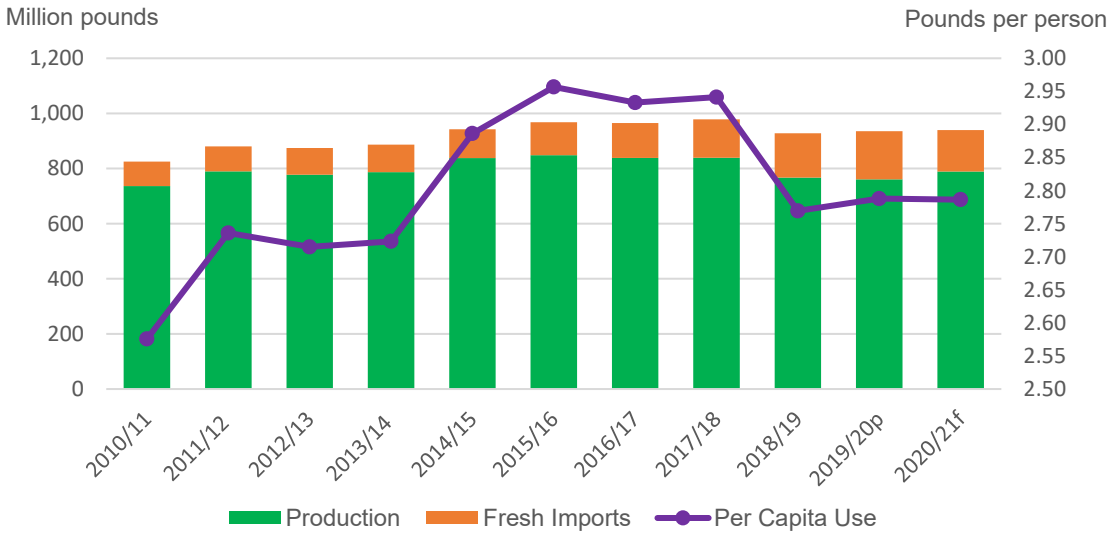
Mushrooms Sales Volume Down

The 2019/20 season sales volume of all mushrooms (Agaricus and specialty), declined 2 percent to 816 million pounds. Most of the volume decline was realized in the white-button mushroom variety from 628.7 million pounds in 2018/19 to 607.7 million pounds in 2019/20. Despite the decline in white-button volume, brown mushrooms (including Portobella and Cremini) increased 3 percent to 188.7 million pounds (table 14).

Fresh Mushroom Supply and Per Capita Availability

Per capita availability (previously called disappearance or use) for fresh Agaricus mushrooms has been steadily climbing since the 2010/11 season with a slight increase of 2.79 pounds per person during the 2019/20 season from 2.77 pounds per person last year. U.S. fresh-mushroom imports grew to an all-time high at over 19 percent of total domestic availability to 174.8 million pounds and continues to be increasingly important to per-capita availability. Fresh-mushroom production also increased 760.8 million in the 2019/20 season pounds (figure 10).

Figure 10
Domestic supply and per capita availability of fresh Agaricus mushrooms



Sources: USDA, National Agricultural Statistics Service, Production; U.S. Dept. of Commerce, Bureau of the Census, Import Data; USDA, Economic Research Service, Per Capita Estimates.

Processed Mushroom Supply and Share of Availability

U.S. processed-mushroom trade share of imports continues to be increasingly important over the past 20 years as the share of imports continues to climb. Despite the volume of imports being relatively stable with 271.6 million pounds of processed imports in 2019/20, the trade share of imports has increased from 67 percent in 2000/01 to an all-time high of over 86 percent in 2019/20 (figure 10). The increase in the trade share of imports is due in part to declines in processed mushroom production over time coupled with a steady decline in per capita availability. Processed exports have remained relatively low over this same 20-year time period.

The top 5 countries shipping to the U.S. representing 91 percent of total processed imports for the past 3 years are the Netherlands (68 percent) with 98.4 million pounds, China (9 percent) with 12.9 million pounds, France (5 percent) with 7.5 million pounds, Spain (5 percent) with 6.9 million pounds, and Poland (4 percent) with 5.9 million pounds. The processed utilization types from the Netherlands for the 2019/20 season were canned (63 percent) with 62.3 million pounds and frozen (37 percent) with 36.1 million pounds.

Potatoes

Production Down on Reduced Area

The first estimate (November) of the 2020 potato crop produced in the 13 States included in the USDA National Agricultural Statistics Service (NASS) estimates program indicated a 3 percent reduction from a year earlier to 415 million hundredweight (cwt) (table 15). All the reduction stemmed from a 2 percent decline in harvested area with 10 of the 13 States reporting fewer acres. The majority of the acreage reductions occurred in Washington, Idaho, California, and Texas. Three States harvested more area in 2020, with the most notable being North Dakota (up 12,500 acres), which was recovering from heavy weather-related acreage losses (21 percent of planted area went unharvested) in 2019. North Dakota, the fifth leading potato-producing State, is one of the top 2 producers of red potatoes which were in short supply last year.

Table 15. U.S. potato area, yield, production, price and crop value, 2000-20

Year	Harvested acres	Yield	Total production	Price[1]	Crop value
	Thousand acres	*Cwt/acre*	*Million cwt*	*Dollars/cwt*	*Million dollars*
2000-04	1,250.0	372	464.7	6.00	2,786.8
2005-09	1,083.9	398	431.4	7.82	3,371.6
2010-14	1,070.3	409	437.4	9.21	4,028.9
2015-19	1,021.0	436	444.9	9.17	4,077.8
2015	1,070.9	419	448.6	8.79	3,941.8
2016	1,037.7	434	450.3	9.08	4,090.7
2017	1,044.5	432	450.9	9.17	4,133.1
2018	1,014.8	443	450.0	8.90	4,006.3
2019	937.3	453	424.4	9.94	4,217.3
2020f	915.7	454	415.5	10.45	4,341.8

f = forecasts. Note: Cwt is hundredweight, a unit of weight equal to 100 pounds.

[1] Grower return from all sales modes.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Favorable weather in key potato-producing regions supported crop growth and harvest activity in most States, which allowed per-acre yield to set a new record-high. National potato yield reached 454 cwt per acre—up slightly from a year earlier and the highest since 2018. Record yields were set in Idaho and Nebraska. Yields were notably lower in Texas (down 16 percent) and Michigan (down 12 percent) while one of the driest growing seasons in years slashed Maine's potato yield 18 percent. This left Maine's potato crop down 20 percent from a year earlier and the smallest output since 1918—oddly, a year also known for a viral pandemic. After peaking in 1946 at 47 million cwt (when the State was the nation's top producer), Maine's annual potato production began a slow downward trend, which stopped and stabilized from

2008 through 2019 due largely to the steadying influence of processing demand. The Maine potato crop will receive a much-needed boost over the next few years due to the opening of another french fry processing plant in Northern Maine this past summer.

Cold storage holdings of frozen potato products were up 6 percent in October from a year earlier to a relatively high 1.2 billion pounds (12.4 million cwt). Holdings of frozen french fries, which accounted for 82 percent of frozen potato stocks, were up 8 percent from a year earlier. This was the largest October buildup since 2004 and could reflect anticipation of stronger retail demand and continued strong pull from drive-through quick-service establishments. It could also imply a slowdown in demand caused by the advent of cooler weather and the resurgence of pandemic infections. Future cold storage reports and retail sales reports may help shed light on this situation.

Meanwhile, stocks of other frozen potato products increased monthly from May to September. However, at the end of October these stocks declined 4 percent from a year earlier and were 3 percent below the previous month. Since there was no known manufacturing impediment, this implies increased demand—perhaps as consumers again began to stock up due to a return to tighter pandemic restrictions. In early to mid-November, some city and state officials were limiting business hours in an effort to slow a further rise in COVID-19 infections.

Table 16. Utilization of U.S. potatoes, 2015-19[1]

Utilization category	2015	2016	2017	2018	2019	Change 2018-19
	Million hundredweight (cwt)					*Percent*
Sales, all seasons[2]	410.1	419.0	421.4	420.4	394.8	-6
Table stock	111.0	114.2	109.8	106.5	97.9	-8
Processing[3]	278.9	285.9	282.1	298.3	283.3	
Frozen french fries	152.3	157.0	155.8	163.1	162.4	0
Other frozen	13.6	12.7	13.8	16.0	11.8	-26
Chips	56.8	60.3	58.8	62.7	59.6	-5
Dehydrated	48.0	48.0	45.8	49.1	41.6	-15
Canned	1.7	1.9	1.9	1.9	1.7	-7
Other	6.4	6.0	6.2	5.6	6.0	9
Other sales	26.6	28.0	27.1	24.8	21.2	-14
Seed	25.6	26.8	25.2	24.1	19.7	-18
Feed	0.9	1.2	1.9	0.7	1.5	119
Non-sales	31.1	31.3	29.8	29.6	29.6	0
Seed, feed, on-farm use	4.6	4.4	4.7	4.0	4.6	14
Shrinkage and loss	26.5	26.9	25.1	25.5	25.0	-2

[1] The potato marketing year begins with harvest in the indicated year and ends in August of the following year.
[2] Sales excludes processing volume from outside the NASS estimating states.
[3] Processing includes some potatoes used by processors that originated from outside the NASS program states.

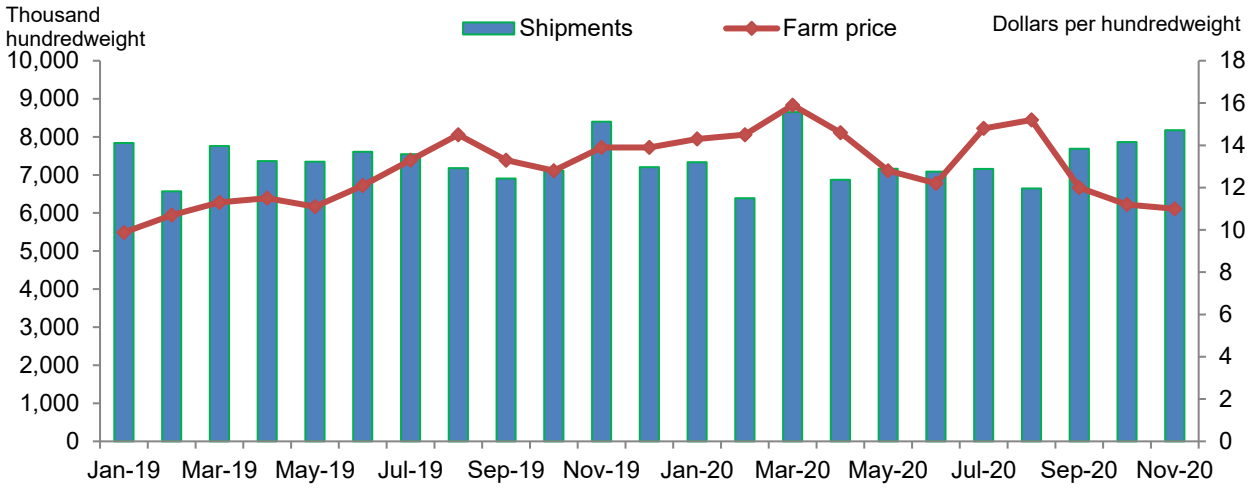
Source: USDA, National Agricultural Statistics Service.

Shipping-point Price Path Uncertain

A tumultuous early spring rife with market uncertainty and angst, courtesy of the pandemic, caused the industry to plant 4 percent fewer acres in 2020—a year that normally might have seen acreage rising due to the incentive of higher prices wrought by the small 2019 crop. With reduced table stock volume from the 2019 crop (table 16) facing strong pre-pandemic demand last fall and then later pandemic-inspired hoarding by consumers this past spring, the market-year average price for all potatoes increased 12 percent to $9.94 per cwt. This was also 8 percent above the 2017/18 average price. Powered in part by stronger retail sales this past spring, table potato prices surged 27 percent to $13.60 per cwt while the average price for processing uses (moderated by contract volume) was up 7 percent to $8.46 per cwt (figure 11).

Figure 11

U.S. monthly fresh potato shipments and price, 2019-20



Source: USDA, Economic Research Service using data from USDA, Agricultural Marketing Service, *Fruit and Vegetable Market.*

The 2020 potato crop is the smallest since 2010 but because of the demand-limiting effects of various pandemic reduction practices, season-average potato prices may not rise much in 2020/21 and could average lower depending on the volume sold early in the season. Typically, about half of the potato crop (all seasons) is marketed in the year it is produced (prior to January 1). This share has been slowly declining for decades due to the increased prevalence of processing. Shipping-point prices for fresh potatoes got off to a weak start during the first few months of the 2020-21 marketing year, running well below year-earlier levels. The November average f.o.b. price for fresh potatoes was more than a tenth below year-earlier levels. This pattern of price weakness may hold until some certainty is injected into the market via an event such as the widespread acceptance of an effective vaccine.

Consumer Prices Ease in Fall, Up in 2020

Reflecting reduced supplies, strong retail demand, and higher prices for the 2019 crop, the Consumer Price Index for fresh potatoes increased 6 percent from a year earlier during January-October 2020 (table 17). This would be the greatest year-over-year increase in fresh potato consumer prices since 2011 when prices surged 12 percent. Prior to the pandemic taking hold in late March and April, fresh potato prices were on track to rise about 4 percent over a year earlier due to the short 2019 crop. Prices began to rise in late March, peaked in August, and eased modestly in September as the fall crop harvest gathered steam.

Table 17. Potatoes: U.S. Consumer and Producer Price Indices and advertised retail prices, 2019-20[1]

Item	2019				2020				4th Q Change[2]	
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q f	Quarter	Year
	Index								*Percent*	
Producer Price Indexes										
Fresh tablestock (2011=100)	105.4	113.2	126.9	127.4	139.8	122.1	128.1	109.0	-14.9	-14.4
Fresh, russet (1991=100)	172.8	182.0	219.4	208.7	229.8	192.1	221.6	173.0	-21.9	-17.1
Fresh, red (1991=100)	168.2	171.9	235.0	286.5	265.8	261.5	213.9	200.0	-6.5	-30.2
Fresh, round white (1991=100)	195.1	154.4	121.4	224.3	229.4	248.6	161.4	250.0	54.9	11.5
Frozen products	208.0	208.0	208.1	208.7	209.5	209.5	209.5	209.9	0.2	0.6
Chips (includes corn) (1985=100)	219.0	219.3	219.5	219.8	222.2	222.2	222.4	222.6	0.1	1.3
Consumer Price Indexes										
Fresh tablestock (1982-84=100)	355.2	357.5	375.6	359.2	371.1	392.9	390.7	362.0	-7.3	0.8
	Dollars/pound									
Retail Prices [4]										
Fresh potatoes, white	0.75	0.75	0.79	0.78	0.79	0.85	0.84	0.78	-6.7	0.5
Potato chips	4.51	4.46	4.44	4.54	4.57	4.98	5.07	5.05	-0.4	11.3
Retail Prices (advertised)[5]										
Fresh, russet	0.529	0.521	0.523	0.502	0.494	0.517	0.516	0.468	-9.4	-6.8
Fresh, red	0.633	0.647	0.712	0.654	0.705	0.726	0.662	0.643	-3.0	-1.7
Fresh, yellow	0.665	0.674	0.715	0.640	0.663	0.744	0.686	0.656	-4.3	2.6
Fresh, round white	0.538	0.550	0.568	0.476	0.579	0.592	0.578	0.545	-5.8	14.6

Note: Q=calendar quarter. f=ERS forecast. 1/ Not seasonally adjusted. 2/ Change in projected fourth quarter 2020 from the previous quarter/year. 3/ Index base year is 1982=100. 4/ As reported by BLS.
5/ Average of weekly advertised retail prices as reported by *Market News* per pound for 5-lb bags.

Source: USDA, Economic Research Service using data from U.S. Dept of Labor, Bureau of Labor Statistics (BLS) and USDA, Agricultural Marketing Service, *Market News Service*.

Most of the price high points occurred during April through August when consumers stocked up on less-perishable staple vegetables like potatoes in grocery stores in order to increase home meal preparation. Fresh potato retail prices reached nominal dollar record highs this summer, with peak August prices averaging 85.6 cents per pound—9 percent above a year earlier. Prices then began to drop seasonally even as a slightly smaller 2020 fall crop was harvested. Advertised retail prices during the holiday-rich fall quarter (October-December) for a 5-pound bag of conventionally grown (non-organic) russet potatoes averaged $1.16 per bag, down 2 percent from a year earlier.

With comfort and snack foods much in demand this year, retail prices for potato chips surged 9 percent above a year earlier to $4.89 per pound during the January-October period. Chip prices

had changed little over the previous 5 years with average annual price increases of less than 1 percent. The potato chip market has long been under price pressure from fabricated chips made from dehydrated potatoes and grains such as corn and wheat. Supplies of potatoes used for chipping in the 93 (the number as of 2019) U.S. chip manufacturing plants had been tight for most of the year. With chip demand remaining strong, supplies could tighten again this coming spring. With a smaller-than-expected potato crop in Michigan and a drought-reduced crop in Maine, both key suppliers of fall/winter chipping potatoes, chip manufacturers may need to look for more acreage from the Florida winter/spring crop to meet demand.

Imports Continue to Rise

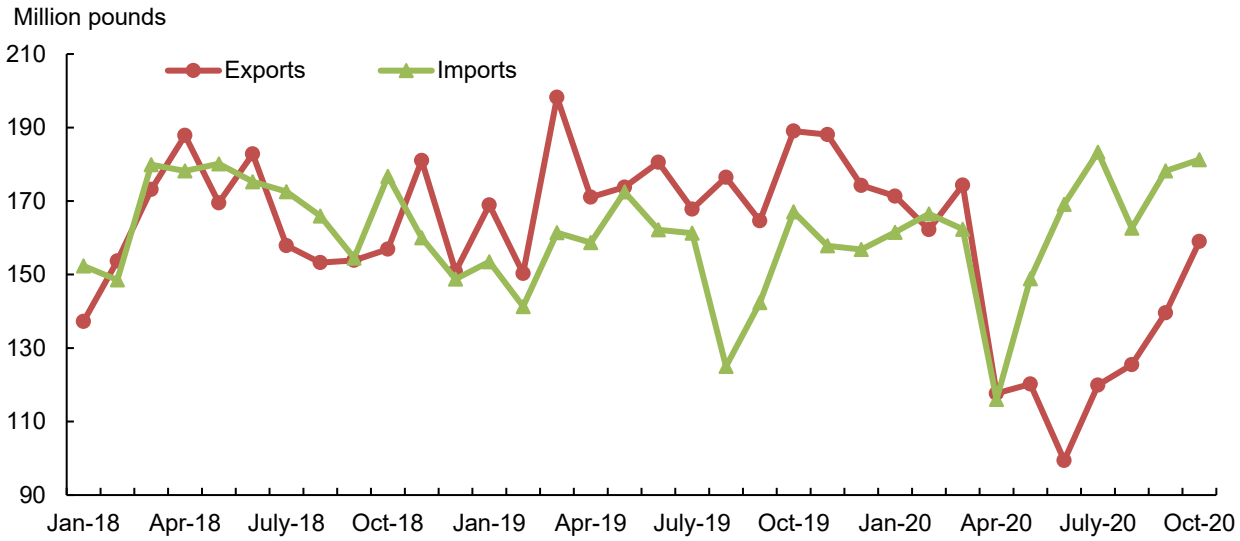
Despite the pandemic, imports of potatoes and potato products continued their upward march. During the January through October period, total potato imports were on pace for double digit gains in terms of both volume and value in 2020. Import volume was higher for each of the major import categories including fresh (up 29 percent), starch (up 23 percent), dried/dehydrated (up 15 percent), frozen (up 10 percent), chips (up 10 percent) and seed (up 7 percent). Unit values (a price proxy) were lower for most items with the exception of frozen yellow potatoes (due to the short domestic crop in 2019), granules and flour (in greater demand due to the pandemic), and frozen french fries. According to the United Nations, the United States is by far the leading importer of frozen potato products with 12 percent of the global volume over the 2014-18 period (the latest data available).

The slight gain in fry value may reflect stronger demand for retail packs for which sales have reportedly been brisk. Import volume of frozen french fries is higher, while volume of other frozen potato products (up 44 percent in 2020) have been surging since 2016. At least a portion of the gain in this category reflect higher retail demand for frozen products such as wedges, tots, rounds, and twice baked.

Notably, the source for much of these rising imports over the past 4 years is the European Union (EU), particularly Belgium and the Netherlands leading EU potato processing nations. Frozen potato import growth appears to coincide with the rapid expansion of European discount supermarket chains in the United States (figure 12). On the East coast, two of these retailers feature low-priced store-brand frozen potato products, sourced from either the EU or Canada. One such retailer, Aldi, has expanded rapidly across the United States and plans to open enough new stores by 2022 to place the retailer third in total store units behind Kroger and Albertson’s. However, in terms of total sales, Aldi is currently the number 5 supermarket chain in

the United States, with total sales about one-fourth that of industry leader Kroger.

Figure 12
U.S. frozen french fries: Export and import volume, 2018-20



Source: U.S. Dept of Commerce, Bureau of the Census.

Pandemic Pulls Exports Down

During the January-October period, the value of U.S. potato exports declined 14 percent from a year earlier to $1.4 billion—the lowest since 2012. The volume of frozen potato exports dropped 19 percent with most of the loss in french fries (down 20 percent), reflecting the pandemic's worldwide impact on foodservice demand. However, since bottoming out this past spring, both imports and exports of frozen fries trended higher through October.

During the first quarter (January-March), the value of all potato exports was down less than 1 percent. Pandemic impacts were concentrated in trade with those countries affected earliest, especially China, where french fry import volume from the United States was cut 41 percent.

Potato export value plummeted 27 percent during the spring quarter (April-June) as most countries went into economic and social lockdowns. With foodservice demand extremely limited, exports of frozen potato products suffered the greatest drop-off, falling 35 percent. Global industrial demand for starch and dextrin also dried up with export value down 28 percent. Fresh potato exports fell 21 percent during the spring with Canada (less need of potatoes destined to be processed into frozen fries) and Japan each reducing imports.

The value of summer quarter (July–September) U.S. potato exports began to recover (especially by September) following the easing of pandemic restrictions but were still 16 percent

below year-earlier levels. Potato chips and dry/dehydrated potato products (each up 3 percent in value) managed to register export gains this summer. While fresh exports were down just 4 percent, frozen exports were off by 25 percent from a year earlier as a weak recovery in foodservice and the restricted travel industry tamped down demand. Also, beginning to help exports was the value of the dollar, which peaked in March, fell substantially against most currencies through the summer and fall, and remains subdued heading into winter. Reasons cited for the weaker dollar since March include a lackluster economy and the rising money supply. However, of current concern is the impact of the current wave of coronavirus infections in the United States and prospects for new economic restrictions.

Dry Edible Beans

Dry Bean Production Expected to Soar Across the U.S.

The top dry bean producing U.S. States are North Dakota, Michigan, Minnesota, and Nebraska, together representing 86 percent of U.S. dry bean production in 2020. According to the USDA's *Crop Production* report, U.S. dry bean production is expected to increase by 68 percent from 2019 (table 18). North Dakota consistently produces more dry beans than any other State and NASS estimates a production increase of 89 percent from 2019. Moreover, all states that NASS reports show increased dry bean production except California in 2020.

Table 18: U.S. dry bean production by state, 2016-20

						Change
Dry Bean States	**2016**	**2017**	**2018**	**2019**	**2020**	**2019-20**
	---------- Hundredweight[1], thousands ----------					**Percent**
California	929	803	735	729	624	-14
Colorado	742	1,071	556	623	1,091	75
Idaho	1,130	1,655	1,103	1,067	1,666	56
Michigan	4,002	4,358	4,564	3,662	6,040	65
Minnesota	3,279	3,491	3,844	4,101	5,839	42
Nebraska	2,723	3,496	2,828	1,883	3,487	85
North Dakota	8,655	11,850	8,811	7,691	14,560	89
Washington	718	599	539	665	1,040	56
Wyoming	733	918	481	390	637	63
Other States[2,3]	345	1,260	3,518	-	-	-
U.S. Total	**23,256**	**29,501**	**26,979**	**20,811**	**34,984**	**68**

[1] Hundredweight, a unit of weight equal to 100 pounds. [2] ERS included MT & TX in Other States from 2016-2018, NASS stopped reporting those states in 2019; [3] ERS adjusted Other States values in 2016 and 2019 so that US totals match the most recent values from *Crop Production Annual*.
Source: USDA, National Agricultural Statistics Service, *QuickStats* and *Crop Production Annual*.

U.S. Dry Bean Production Expected to Increase

The top U.S. dry bean producing classes are pinto, black, navy, and kidney (dark and light red) representing 80 percent of the total U.S. dry beans produced in 2019. U.S. dry bean production was down 23 percent from 2018 with declining production in most dry bean classes except baby lima and light red kidney beans (table 19). Disregarding the other bean category, the largest production declines within the most predominant bean classes in 2019 were with navy (down 28 percent) and pinto (down 23 percent). The top 3 U.S. States (Michigan, North Dakota, and Minnesota) producing 98 percent of all U.S. navy beans all declined from 2018. Similarly, the top 2 U.S. States (North Dakota and Nebraska) producing 78 percent of all U.S. pinto beans

declined from 2018. NASS estimated production for the 2020/21 (September – August) season to increase by 68 percent from the previous season. ERS utilized the NASS estimated 2020 total bean production to forecast the production breakdown by dry bean class (table 19).

Table 19: U.S. dry bean production by class, 2016-20

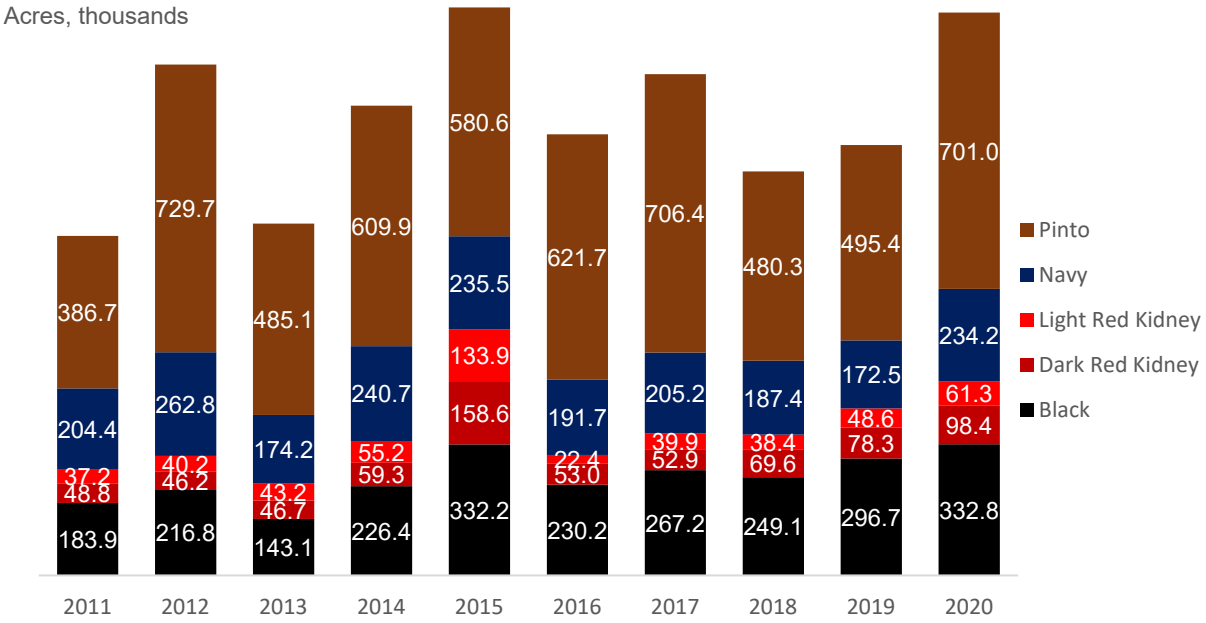
Commodity	2016	2017	2018	2019	2020f[1]	Change 2019-20
	----------Hundredweight[2], thousands----------					Percent
Dry Bean Classes						
Black	4,360	5,120	5,212	5,069	6,971	38
Blackeye	572	437	528	259	554	114
Cranberry	65	185	244	161	267	66
Dark red kidney	1,126	1,099	1,625	1,489	1,907	28
Great northern	845	1,403	1,188	1,040	1,643	58
Light red kidney	462	899	897	915	1,227	34
Lima baby	209	204	275	278	343	23
Lima large	300	255	234	197	311	58
Navy	3,516	4,161	4,191	3,029	5,151	70
Pink	307	332	398	291	462	59
Pinto	9,638	13,617	8,778	6,769	13,200	95
Small red	657	438	701	567	772	36
Small white	0	171	155	105	195	86
Other	1,199	1,180	2,553	642	1,980	208
Total Beans	**23,256**	**29,501**	**26,979**	**20,811**	**34,984**	**68**

[1] f = ERS forecast, [2] Hundredweight, a unit of weight equal to 100 pounds.
Sources: USDA, Economic Research Service, 2020 Dry Bean Class Projection; USDA, National Agricultural Statistics Service, *QuickStats*, 2016-19 and 2020 total.

Dry Bean Planted Area and Yield Up

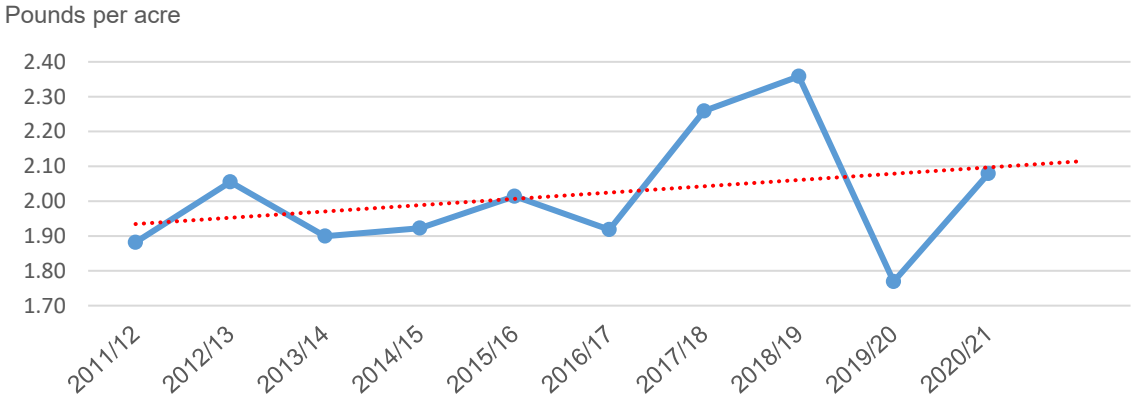
The 2019/20 (September - August) dry bean season is complete and overall, dry bean planted acres are up 26 percent from the previous year with several months in the 2020/21 dry bean season yet to be realized. The top dry bean classes planted (pinto, black, navy, and kidney) are all up from the 2019/20 season (see figure 13). The dry bean class with the largest increase among the most predominant classes was pinto with a 42 percent change from 2019 followed by navy with a 36 percent change. Pinto planted acres represent 43 percent of total planted acres while navy represent 14 percent of total planted bean acres in 2020. U.S. dry bean yield for the 2019/20 season is down 14 percent from the 2018/19 season (see figure 14).

Figure 13
Dry bean planted area by major class, 2011-20



Source: U.S. Dept. of Agriculture, National Agricultural Statistics Service, *QuickStats*.

Figure 14
Dry bean yield and trend, 2011-20[1]



[1] Excludes chickpeas.
Sources: USDA, Economic Research Service derived 2011/12 - 19/20 using data from USDA, National Agricultural Statistics Service, *QuickStats.*

Dry Bean Exports Continue Downward Trend

The Food and Agriculture Organization of the United Nations reported the world's top 4 dry bean producing countries were India (19.6 percent), Myanmar (15 percent), Brazil (9.2 percent), and the U.S. (5.4 percent) in 2018. In 2020, the U.S. exported dry beans to 89 countries and the top 5 U.S. export destination countries reported by the Department of Commerce, U.S. Census Bureau were Mexico, Italy, Canada, Dominican Republic, and the United Kingdom which together represented 63 percent of all U.S. dry bean exports.

U.S. dry bean exports overall are down by 4 percent to 754 million pounds in 2019/20 from the previous season, (table 20) which continues a downward trend as the 2018/19 season was previously down by 8 percent to 784 million. The most predominant U.S. dry bean classes exported in the 2019/20 season are kidneys (32.5 percent), which include dark red, light red, and unspecified kidney beans; black (21.7 percent); navy (18.9 percent); and pinto (14.5 percent). Among the more predominant classes, navy bean exports had the most significant decline of approximately 9 percent to 142 million pounds with most of that decline occurring within the United Kingdom and Italy. However, black bean exports offset much of the navy bean decline with a 55 percent increase from the previous season to 163 million pounds. In the 2019/20 season, the U.S. top 4 black bean export destination countries were Mexico, Dominican Republic, Costa Rica, and Haiti, as all black bean exports to those countries increased from the previous year.

Dry Bean Imports Up

In 2020, the U.S. imported dry beans from 69 countries and the top 5 countries reported by the Department of Commerce, U.S. Census Bureau were Canada, Mexico, Nicaragua, China (Mainland), and India, which together represented 72 percent of all U.S. dry bean imports.

U.S. dry bean imports overall are up by 34 percent from the previous season (see table 20). Disregarding the "other bean" class category, the most predominant U.S. dry bean classes imported in the 2019/20 season were mung beans (23 percent); kidney beans (19 percent), which include dark red, light red, and unspecified kidney beans; black beans (12 percent); and pinto beans (9 percent). Mung beans are less well known but in the U.S. are mostly used for bean sprouts in salads or used in soup mixes and bean flour. All the predominant bean class imports increased significantly from the previous season. Imports of mung bean were up by 52 percent to 68 million pounds, kidney bean imports were up by 40 percent to 57 million pounds,

black beans were up by 42 percent to 37 million pounds, and pintos were up by 78 percent to 28 million pounds.

Table 20: U.S. dry bean seasonal export and import volume by class, 2017-20[1]

Commodity	Sep - Aug 2017/18	2018/19	2019/20	Change 2018/19- 2019/20
	--- Hundredweight[2], thousands ----------			Percent
Exports by Class				
Bambara	0.08	0.10	0.03	-66
Black	120.09	105.37	163.40	55
Blackeye	4.01	2.13	1.82	-15
Cranberry	9.39	5.00	9.59	92
Great northern	22.10	51.00	17.28	-66
Kidney, dark red	109.35	139.25	154.14	11
Kidney, light red	30.87	30.50	26.04	-15
Kidney, unspecified	134.77	79.79	64.97	-19
Lima	15.59	20.36	17.62	-13
Lima, baby	6.15	4.01	3.11	-23
Mung	9.37	4.27	2.75	-36
Navy	157.25	155.70	142.08	-9
Pink	4.16	4.63	3.60	-22
Pinto	131.97	112.71	109.19	-3
Small red	25.93	21.39	21.11	-1
White	2.81	4.37	2.76	-37
Other beans, excluding garbanzos	64.60	43.45	14.14	-67
Total Bean Exports	**848.50**	**784.02**	**753.62**	**-4**
Imports by Class				
Bambara	0.36	0.25	0.28	10
Black	31.39	25.91	36.82	42
Blackeye	3.35	15.75	13.05	-17
Great northern	1.63	1.36	6.58	382
Kidney, dark red	6.20	3.60	3.96	10
Kidney, light red	15.21	16.26	22.22	37
Kidney, unspecified	33.37	20.99	30.85	47
Lima	0.71	0.67	1.09	63
Lima, baby	0.70	0.87	0.61	-29
Mung	44.81	44.42	67.55	52
Navy	4.33	7.45	3.17	-58
Pinto	16.29	15.60	27.81	78
Small red	12.52	13.74	19.57	42
White	2.31	1.29	2.47	91
Other beans, excluding garbanzos	60.37	53.23	61.05	15
Total Bean Imports	**233.56**	**221.41**	**297.08**	**34**

Note: [1] This table excludes planting seed, [2] Hundredweight, a unit of weight equal to 100 pounds.
Source: USDA, Economic Research Service using data from U.S. Dept. of Commerce, Bureau of the Census.

In the 2019/20 season, the U.S. top 4 mung bean import origination countries were India, China (Mainland), Thailand, and Myanmar (Burma), representing 84 percent of all mung bean imports to the U.S. and all 4 countries increased mung bean imports from the previous year. In the 2019/20 season, the U.S. top 4 kidney bean import origination countries were Nicaragua, Mexico, Canada, and Argentina, representing 77 percent of all kidney bean imports to the U.S. and all 4 countries increased kidney bean imports from the previous year. In the 2019/20 season, the U.S. top 3 black bean import origination countries were Canada, Mexico, and Argentina, representing 84 percent of all black bean imports to the U.S. and all 3 countries increased black bean imports from the previous year. In the 2019/20 season, the U.S. top 2 pinto bean import origination countries were Canada and Mexico, representing 98 percent of all pinto bean imports to the U.S. and both countries increased pinto bean imports from the previous year.

Dry Peas and Lentils

Dry Pea Acreage Down, Lentil Acreage Up

The 2019/20 (July-June) marketing season for chickpeas is complete. According to the USDA's *Crop Production* report, overall area planted for dry peas declined 9 percent from last year's estimate to 0.99 million acres (table 21). NASS has included Austrian winter peas and wrinkled seed peas in the dry pea estimates since 2019. Lentil planted acreage increased 7 percent from last year's estimate to 0.52 million acres. Harvested acreage, production, value, and yield for dry peas and lentil estimates followed similar declining trends for dry peas and increasing trends for lentils from last year.

Table 21: U.S. dry pea and lentil acres, production, price, value, and yield

Item	2010	2017	2018	2019	2020	Change 2019-20
	Acres, thousands					Percent
Planted						
Dry peas, all	756.0	1,128.0	856.5	1,103.0	999.0	-9
Lentils	658.0	1,104.0	780.0	486.0	518.0	7
	Acres, thousands					
Harvested						
Dry peas, all	711.4	1,051.5	807.9	1,052.0	949.0	-10
Lentils	634.0	1,022.0	718.0	431.0	486.0	13
	Hundredweight[1], thousands					
Production						
Dry peas, all	14,221	14,195	15,929	22,346	18,534	-17
Lentils	8,657	7,482	8,408	5,388	6,504	21
	Dollars per hundredweight					
Price[2]	**2009/10**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**Change 2018/19-2019/20 Percent**
Dry peas, all	8.98	11.00	11.80	10.50	9.64	-8
Lentils	26.80	28.50	25.90	17.70	15.70	-11
	Dollars, thousands					
Value[3]						
Dry peas, all	138,792	165,770	163,963	212,328	178,668	-16
Lentils	219,073	188,906	131,739	78,779	102,113	30
	Pounds per acre, thousands					
Yield						
Dry peas, all	1.999	1.350	1.972	2.124	1.953	-8
Lentils	1.365	0.732	1.171	1.250	1.338	7

[1] Hundredweight, a unit of weight equal to 100 pounds, [2] NASS marketing year price averages, July-June for dry peas and lentils; [3] Values for 2020 are preliminary calculations derived by Economic Research Service based on recently published prices and production.
Source: USDA, National Agricultural Statistics Service, *Crop Production* and *Agricultural Prices.*

Dry Pea Exports Up

U.S. dry pea export volume has increased 36 percent from the 2018/19 season. Green and split pea classes are the most predominant classes representing 80 percent of total dry pea export volume and have increased up to 1,214.4 million pounds from the 2018/19 season (table 22). Yellow peas are the third predominant class of dry pea and have increased 283 percent from the 2018/19 season. Austrian winter peas are the smallest class of dry pea exported and have declined 44 percent from 2018/19 season.

Table 22: U.S. dry pea seasonal year export volume by class, 2017-20[1]

Commodity	July - June				Change 2018/19 - 2019/20
	2016/17	2017/18	2018/19	2019/20	
	---------- Thousand hundredweight[2] ----------				Percent
Exports by class					
Austrian winter peas	4.8	10.3	5.9	3.3	-44
Green peas	843.3	479.9	576.8	708.2	23
Split peas	315.2	280.1	351.0	506.2	44
Yellow peas	732.1	121.8	56.7	217.1	283
Other peas, excluding chickpeas	350.2	106.1	135.3	92.4	-32
Total	**2,245.4**	**998.1**	**1,125.7**	**1,527.3**	**36**

[1] This table excludes planting seed, [2] Hundredweight, a unit of weight equal to 100 pounds.
Source: USDA, Economic Research Service using data from U.S. Dept. of Commerce, Bureau of the Census.

Lentil Exports Down and Lentil Exports to India Plummet

U.S. lentil export volume is down 52 percent from the 2018/19 season (table 23). Lentil export volume to India declined from 154.6 million pounds in 2018/19, as the second largest lentil export destination, to 16.1 million pounds, becoming the seventh largest export destination not including “other States” in 2019/20. Lentil exports to Canada have also declined 64 percent from 2018/19 but despite the decline, Canada remains the top destination of U.S. lentil exports. Although China is not a top lentil export destination, China’s lentil export volume has increased 325 percent from 2018/19.

Table 23: U.S. dry lentil exports by destination, 2017-20[1]

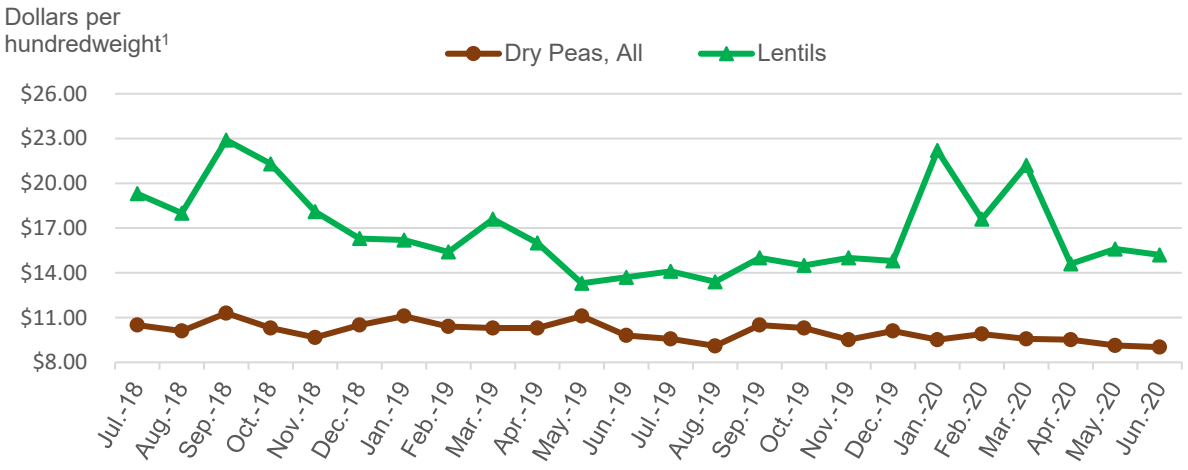
Commodity	July - June 2017/18	2018/19	2019/20	Change 2018/19 - 2019/20
	---------- Hundredweight[2], thousands ----------			Percent
Exports by destination				
Canada	18.2	195.2	70.3	-64
India	161.9	154.6	16.1	-90
Spain	64.4	83.3	58.9	-29
Mexico	25.4	56.4	30.6	-46
Colombia	15.5	50.4	45.1	-11
Peru	25.3	41.3	26.0	-37
Sudan	24.2	22.7	29.5	30
Italy	20.0	18.2	9.9	-46
China (Mainland)	2.0	2.1	9.1	325
United Arab Emirates	13.3	14.0	4.3	-69
Other countries	78.1	111.3	57.0	-49
Total	**448.4**	**749.5**	**356.8**	**-52**

[1] This table excludes planting seed, [2] Hundredweight, a unit of weight equal to 100 pounds.
Source: USDA, Economic Research Service using data from U.S. Dept. of Commerce, Bureau of the Census.

Dry Pea and Lentil Prices Decline

According to the USDA's *Agricultural Prices* report, average prices for the 2019/20 marketing season declined 8 percent for dry peas to $15.70 per hundredweight and 11 percent for lentils to $9.60 per hundredweight from last season (table 21 and figure 15). Dry pea and lentil producers are eligible for loan deficiency payments (LDPs) from local FSA county offices if posted weekly regional prices are lower than published loan rates. LDPs are potentially available from the beginning of harvest through the end of May. During the 2019 crop season, lentil prices fell below posted regional rates in both the eastern and western regions August 16, 2019 – May 29, 2020, ranging from $0.20 - $2.20 per hundredweight below the posted regional rates with the highest shortfall in mid-November of 2019. The repayment rate for lentils fell below the loan rate in early June 2020 but since most harvesting begins in late July, no lentil LDPs were processed for the 2020 season. No dry pea LDPs have been triggered in the 2019 or 2020 seasons thus far.

Figure 15
U.S. dry pea and lentil prices, July-June, 2018-20



[1] Hundredweight, a unit of weight equal to 100 pounds.
Source: USDA, National Agricultural Statistics Service, *Agricultural Prices.*

Chickpeas

Chickpea Area, Price, and Value Continue to Decline

The 2019/20 (September - August) season for chickpeas is complete. According to the USDA's *Crop Production* report, overall area planted for large and small chickpeas declined 38 and 62 percent respectively from last year's estimates to 254 thousand acres (table 24). Chickpea estimates for harvested acreage, production, and value followed similar downward trends from the previous year. The decrease in chickpea planted, harvested, and production is a result of grower reactions to low prices. However, chickpea yield overall is mostly unchanged with an increase of 1 percent for large chickpeas and virtually no change for small chickpea yield from the previous year.

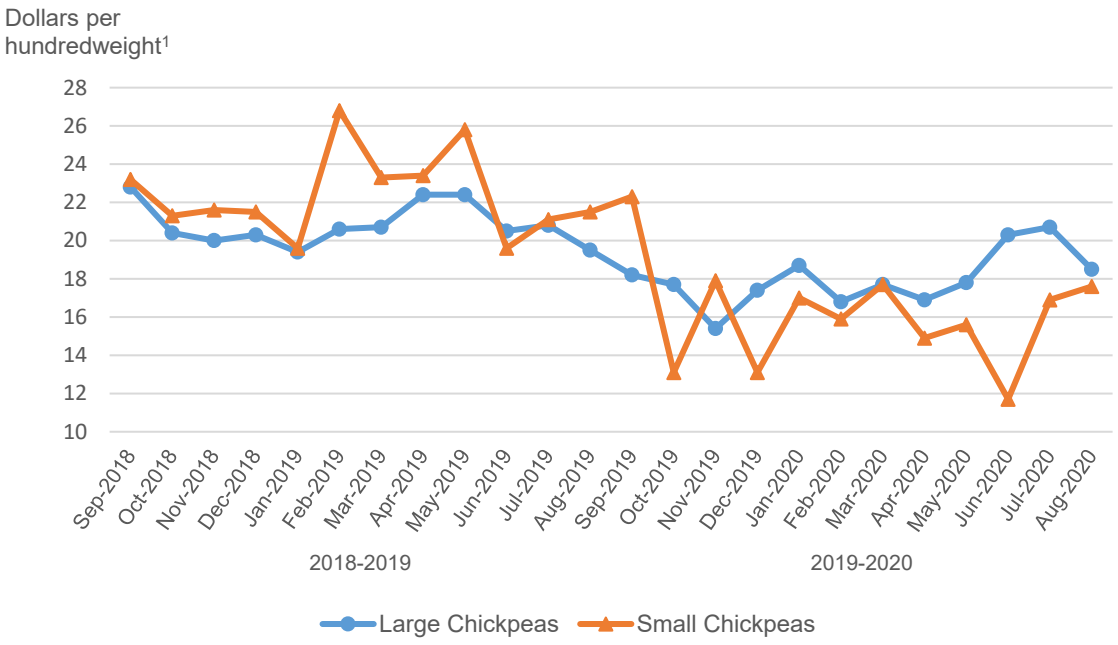
Table 24: U.S. chickpea acres, production, price, value, and yield

Item	2010	2017	2018	2019	2020f[1]	Change 2019-20
	Acres, thousands					Percent
Planted						
Large chickpeas	120.9	446.0	637.5	346.4	214.0	-38
Small chickpeas	25.1	179.5	225.7	105.0	40.0	-62
	Acres, thousands					
Harvested						
Large chickpeas	119.6	435.2	623.9	310.7	210.4	-32
Small chickpeas	24.5	175.8	222.6	93.3	38.8	-58
	Hundredweight[2], thousands					
Production						
Large chickpeas	1,594	5,088	9,441	4,814	3,295	-32
Small chickpeas	345	1,969	3,346	1,423	594	-58
	Dollars per hundredweight					
Price[3]	**2009/10**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**Change 2018/19-2019/20 Percent**
Large chickpeas	29.1	32.1	34.6	20.9	17.8	-15
Small chickpeas	20.3	24.9	25.4	21.5	15.0	-30
	Dollars, thousands					
Value[4]						
Large chickpeas	48,019	170,960	209,774	93,037	58,651	-37
Small chickpeas	7,823	52,170	71,677	24,019	8,910	-63
	Pounds per acre, thousands					
Yield						
Large chickpeas	1.33	1.17	1.51	1.55	1.57	1
Small chickpeas	1.41	1.12	1.50	1.53	1.53	0

[1] f = forecast; [2] Hundredweight, a unit of weight equal to 100 pounds; [3] NASS marketing year price averages, September-August for chickpeas; [4] Values for 2020 are preliminary and ERS derived based on recently published NASS prices and production.
Source: USDA, National Agricultural Statistics Service, *Crop Production* and *Agricultural Prices*.

According to the USDA's *Agricultural Prices* report, large and small chickpea average prices for the 2019/2020 marketing season declined 15 and 30 percent respectively from the previous season (table 24 and figure 16). Chickpea acres and prices have been trending down for the past 2 years following a large supply and soaring prices in 2017 and 2018 in addition to ongoing trade duties from India.

Figure 16
U.S. chickpea monthly prices received, September - August, 2018-20



[1] Hundredweight, a unit of weight equal to 100 pounds.
Source: USDA, National Agricultural Statistics Service, *QuickStats* and *Agricultural Prices.*

Chickpea Prices Triggered LDPs in 2019, No LDPs in 2020

Chickpea producers are eligible for loan deficiency payments (LDPs) from local FSA county offices if posted weekly regional prices are lower than the published loan rate. LDPs are potentially available from the beginning of harvest through the end of May. During the 2019 marketing year, large and small chickpea prices fell below the posted national rate September 20, 2019 – April 10, 2020 (with the exception of the week of September 27, 2019) triggering LDPs ranging from $0.04 - $0.50 per hundredweight with the highest rates triggered in early to mid-November of 2019. No LDPs have been triggered for the 2020 season thus far.

U.S. Exports Up For 2019/20 Despite Pandemic and Tariffs

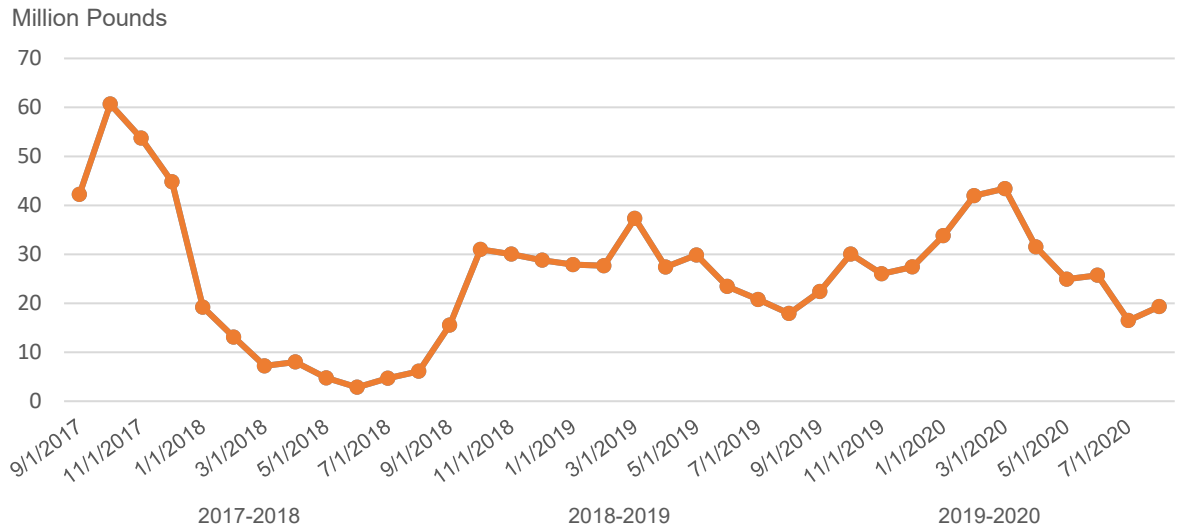
The Food and Agriculture Organization of the United Nations reported the world's top 5 chickpea producing countries were India (66.1 percent), Australia (5.8 percent), Turkey (3.7

percent), the Russian Federation (3.6 percent), and the U.S. (3.4 percent) in 2018. In 2020, the U.S. exported chickpeas to 45 countries and the top 3 countries reported by the Department of Commerce, U.S. Census Bureau were Pakistan, Spain, and Canada, which together represented 72 percent of all U.S. chickpea exports.

U.S. export volume during the 2019-20 season averaged 28.6 million pounds, peaking in March 2020, at 43.4 million pounds (figure 17) when many regions began shutting down business and schools to slow the spread of COVID-19. This spurred increased demand as consumers prepared to cook at home. In comparison to the 2018-19 season, export volume is up 8 percent mostly attributed to increased chickpea exports to Pakistan, which increased 71 percent to 126 million pounds from the previous season alone. This offset declines in other key markets in India (down 67 percent), Portugal (down 49 percent), and Canada (down 23 percent).

India, the world's largest producer of chickpeas, lowered the import duty of chickpeas from 50 percent to 30 percent for the U.S., while reducing duties for all other countries from 30 percent to 10 percent. India reduced its import duties to curb the supply shortages brought on by India's cargo transportation restrictions to slow the spread of COVID-19. Despite the duty reduction for the U.S., chickpea trade with India has continued to decline. India's retaliatory tariffs were initially established in early 2018 in response to Trump Administration efforts to protect U.S. steel and aluminum producers and were continued in June of 2019 after a Presidential Proclamation removed India from the U.S. Generalized System of Preferences program in May 2019 (Congressional Research Report #R45903).

Figure 17
Chickpea monthly export volume



Source: U.S. Department of Commerce, U.S. Census Bureau.

Organic Vegetables

Organic Area Continues to Trend Higher

The National Agricultural Statistics Service (NASS) of USDA released its latest survey of national organic food production in October. The first organic survey was initiated in 2008 and was conducted as part of the Census of Agriculture as a special study. The 2008 and 2014 surveys collected data from certified and exempt organic operations, while all other surveys (including the 2011 and 2019 surveys) collected data only from certified organic operations.

Table 25. Certified organic vegetables: U.S. farms, area, and production, 2011 and 2019[1]

Commodity	2011			2019			Change		
	Farms	Area[2]	Quantity	Farms	Area[2]	Quantity	Farms	Area	Quantity
	Number	*Acres*	*Cwt*	*Number*	*Acres*	*Cwt*		*Percent*	
All vegetables	1,998	118,071	NA	3,300	224,122	NA	65.2	89.8	NA
Lettuce, all	810	22,673	2,466,424	1,129	38,525	6,086,142	39.4	69.9	146.8
Tomatoes, field	928	5,997	3,125,274	1,238	10,751	5,869,683	33.4	79.3	87.8
Potato, table	732	9,088	2,379,491	886	23,612	3,948,714	21.0	159.8	65.9
Carrots	485	9,802	1,504,233	961	11,959	3,503,842	98.1	22.0	132.9
Onions, dry bulb	492	3,311	1,385,177	964	7,520	3,300,290	95.9	127.1	138.3
Spinach	311	9,162	582,948	603	23,018	2,015,494	93.9	151.2	245.7
Sweet potatoes	177	4,348	904,826	401	9,130	1,669,935	126.6	110.0	84.6
Celery	114	1,406	536,841	328	3,786	1,540,323	187.7	169.3	186.9
Broccoli, all	444	6,461	743,088	821	11,945	1,418,623	84.9	84.9	90.9
Corn, sweet	311	9,504	1,160,842	497	11,059	1,332,976	59.8	16.4	14.8
Squash	954	4,923	638,080	1,540	7,848	1,178,666	61.4	59.4	84.7
Cauliflower	185	1,751	168,793	450	7,583	1,118,299	143.2	333.1	562.5
Cabbage, all	432	1,534	244,395	970	3,568	762,766	124.5	132.6	212.1
Peppers, bell	502	901	155,410	926	1,779	376,611	84.5	97.4	142.3
Beans, snap	618	4,568	318,596	782	6,513	371,773	26.5	42.6	16.7
Peas, green	274	6,143	319,998	524	9,397	284,100	91.2	53.0	-11.2
Garlic	503	772	66,246	1,047	2,419	152,711	108.2	213.3	130.5
Herbs, fresh-cut	406	3,142	195,793	853	2,047	104,698	110.1	-34.9	-46.5
Artichokes	40	308	28,125	92	432	68,529	130.0	40.3	143.7
Green onions	NA	NA	NA	528	332	29,181	NA	NA	NA
Other vegetables	928	10,228	922,141	1,601	28,150	5,750,699	72.5	175.2	523.6
Pulse/other crops									
Beans, dry edible	118	17,907	285,803	210	26,192	428,208	78.0	46.3	49.8
Chickpeas	NA	NA	NA	31	6,048	105,458	NA	NA	NA
Dry peas and lentils	62	10,379	101,998	NA	30,482	376,055	NA	193.7	268.7
Lentils	NA	NA	NA	44	12,434	101,398	NA	NA	NA
Peas, dry	NA	NA	NA	104	16,666	254,890	NA	NA	NA
Peas, dry Austrian	NA	NA	NA	12	1,382	19,767	NA	NA	NA
Herbs, dried	43	2,988	37,583	43	1,872	33,684	0.0	-37.3	-10.4

Note: NA=not available or applicable. Cwt=hundredweight. 1/ Field-grown only. 2/ Area includes fresh-market and processing.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Certified vegetable farms sell through wholesale markets, direct to consumers (Community Supported Agriculture arrangements, farm stands, farmers markets, internet, mail), and via retail markets, local restaurants, and institutions. Farm sales of organic vegetables nearly doubled

between 2011 and 2019 to $2.1 billion. In 2019, five States accounted for 83 percent of all certified organic vegetable sales, led by California with $1.4 billion (66 percent). Arizona (6 percent), Oregon (6 percent), Washington (4 percent), and Florida (2 percent), round out the top five States. Arizona is the second leading purveyor of organic vegetables by sales with both area and sales concentrated in 3 crops: lettuce, spinach, and broccoli.

The 2019 survey revealed that area devoted to fresh and processing vegetables certified as organic increased 90 percent since 2011 (table 25). California (60 percent of organic area), Washington (7 percent), Arizona (4 percent), Oregon (4 percent), and Wisconsin (3 percent), were the top 5 states in terms of organic vegetable area. Lettuce, tomatoes, and spinach were the top 3 certified vegetables in terms of acres harvested. The number of farms producing certified organic vegetables increased 65 percent between 2011 and 2019 with farm numbers rising in most states. Texas was the only State with at least 1,000 acres in certified organic vegetables to register a reduction in farms.

Lettuce (of all types) replaced tomatoes as the top certified organic vegetable in 2019 in terms of both volume and value of sales. Lettuce has been the sales leader among organic vegetables for several years, but tomatoes had long been the volume leader. This largely reflects the enduring popularity of bagged salad mixes which has driven growth in romaine and leaf lettuces in general. About one-tenth of U.S. lettuce area is now sold as certified organic.

Organic culture has become an important factor in the spinach industry. About 70,000 acres of spinach is harvested in the United States under all forms of crop culture. Based on the 2019 organic survey, about one-third of this acreage is now certified as organic. This compares with about 15 percent of cauliflower, 11 to 12 percent of carrots and celery, 5 percent of sweet potatoes, and 3 percent of tomato area.

Among reported organically grown field crops, dry edible beans were valued at nearly $30 million in 2019. Production has risen 50 percent since 2011 to 428 thousand cwt with black beans (44 percent of dry beans) and pinto beans (36 percent) accounting for the majority of dry beans grown organically. Reflecting both rising demand for organics in general and new products featuring pulse crops, organically produced dry pea and lentil output has jumped 269 percent since 2011. About 2 percent of dry pea and lentil area is now produced under organic culture.

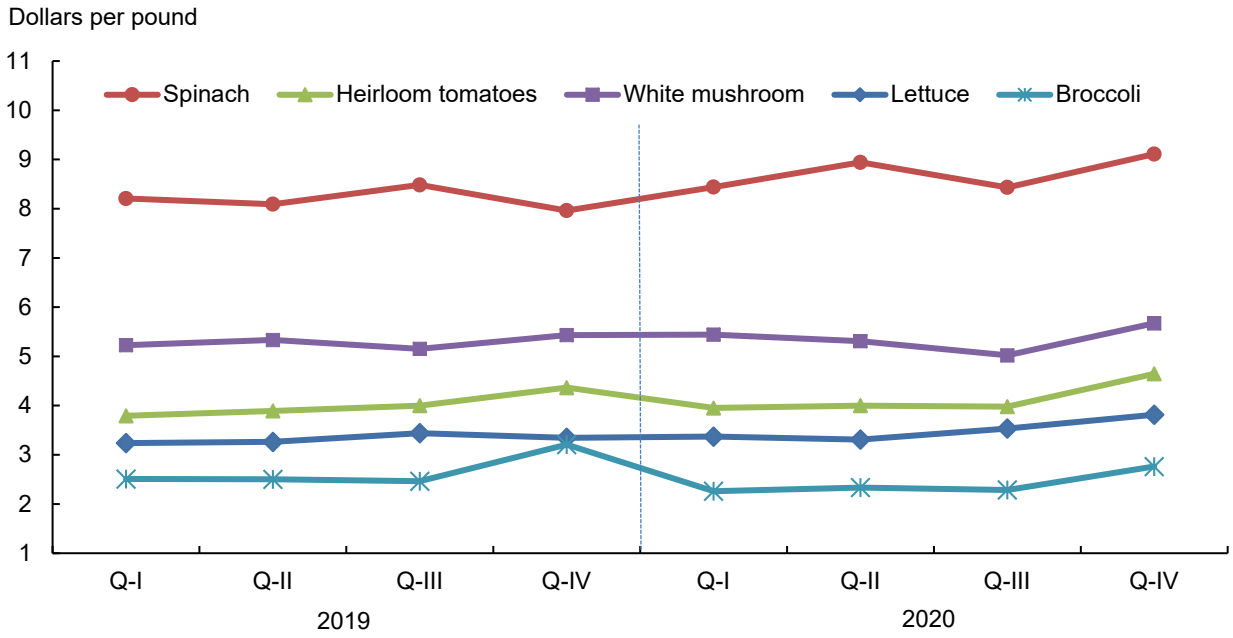
Driven by rising interest in Mediterranean, Middle Eastern, and Indian foods, consumption and production of chickpeas (garbanzo beans) has been trending higher. As a result, over 6,000 acres were reported to be certified organic in 2019. Certified organic garbanzo beans

(chickpeas), which were grouped with dry beans in 2011 but are now reported separately, had sales of $7 million in 2019.

Organic Retail Prices Mixed in 2020

Advertised retail prices for most organic vegetables posted limited increases over the first 3 quarters of 2020 (figure 18). Following the unsettled nature of the market during the early days of the pandemic, market volume for both organic and conventionally grown vegetables settled into a steady pattern with retail sales moving to a higher level. Average advertised retail prices for flat baby spinach (up 4 percent), romaine hearts (up 3 percent), and heirloom round tomatoes (up 2 percent) registered modest gains while prices for broccoli (down 8 percent) and cauliflower (down 4 percent) declined from the weather-induced highs of a year earlier. Despite weathering a period of supply shortages in late spring and early summer, retail prices for white button mushrooms remained steady.

Figure 18
Organic vegetables: Selected advertised quarterly retail prices, 2019-20



Source: Compiled by USDA, Economic Research Service from data of USDA, Agricultural Marketing Service, *Market News*.

The advertised retail price premium for many organic vegetables was generally running between 40 percent and 70 percent in November. For example, the advertised retail price for a 1-pound bag of baby peeled organic carrots was selling 58 percent above conventionally produced carrots in November 2020 and were 53 percent higher in November 2019. These higher prices have not been an impediment to sales over the last few years. In general, as per

capita disposable income has risen, consumers have been willing to spend more to acquire premium vegetables (e.g., greenhouse, heirloom varieties) and various organics.

Suggested Citation

Lucier, Gary and Wilma Davis, *Vegetables and Pulses Outlook*, VGS-365, U.S. Department of Agriculture, Economic Research Service, December 17, 2020.