COVID-19 Losses for U.S. Soybean Crushers & Farmers

Report for:

National Oilseed Processors Association and United Soybean Board

July 2020

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Executive Summary

The world economy has been hit hard by COVID-19. The IMF now forecasts that only China and India among individual economies will have higher GDP in 2021 than in 2018.

U.S. GDP in 2021 is expected to be 2% less than in 2018, even after recovering next year.

U.S. diesel and biodiesel demand have been less badly hit during the COVID-19 lockdown than gasoline demand. Among U.S. biodiesel feedstocks, soybean oil was largely insulated from the fall in biodiesel output, as soybean oil was used to offset the loss of supplies of other oils and fats as a direct result of the contraction that occurred in other sectors.

Soybean meal demand depends on U.S. livestock activity. This was hit in April, but then recovered in May, with a similar pattern in all major meat sectors, as well as egg layers.

The U.S. crush of soybeans fell in May, in anticipation of a slowdown in the demand for soybean meal from livestock producers.

The loss of value due to COVID-19 between January and June 2020 is summarized in Table EXEC.1. The loss of value on total sales (excluding changes in stocks), derived entirely from detailed estimates published by USDA WASDE, may be shown to be:

- **$220 million on soybean meal, a 1.4% decline in value;**
- **$1,500 million on soybean oil, a 17.5% decline in value;**
- **A total of $1,720 million on the two products combined, a 7.2% decline in value;**
- **$2,999 million on soybean sales, an 8.3% decline in value.**

Table EXEC.1: Loss of value due to COVID-19 in the 2019/20 market year between January and June 2020 on sales by U.S. soybean producers and crushers, $ million

	Value in $ million		Loss of value due	
Date of estimate	Jan-20	Jun-20	to COVID-19	as a %
Soybean meal	15,250	15,030	**220**	**1.4%**
Soybean oil	8,568	7,068	**1,500**	**17.5%**
Combined products	23,818	22,098	**1,720**	**7.2%**
Soybean production	36,072	33,074	**2,999**	**8.3%**

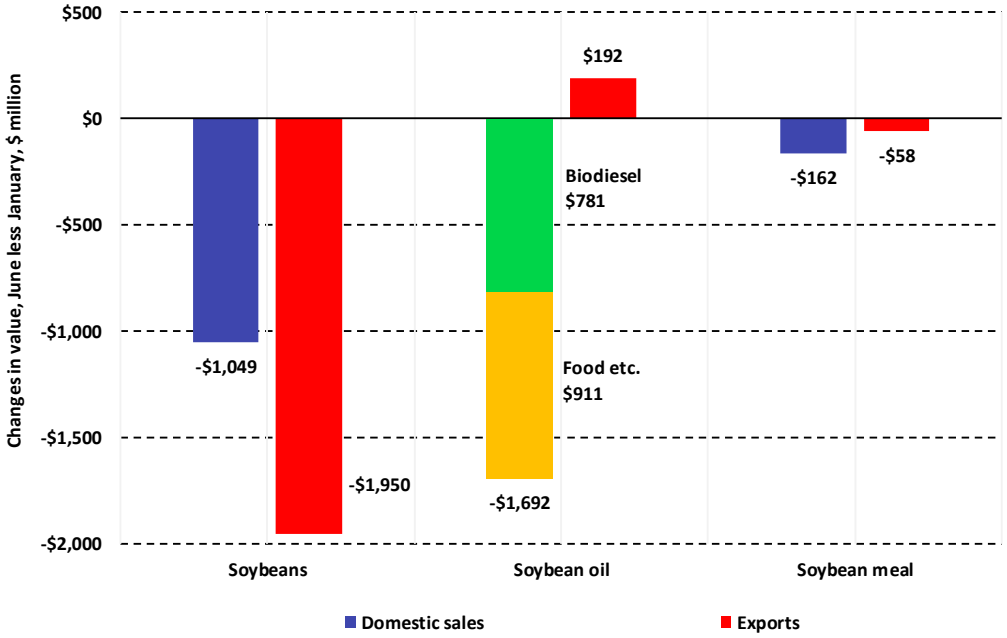
Sources: Derived from USDA World Agricultural Supply and Demand Estimates (WASDE) reports in January and June 2020.

Soybean oil proves to be the product whose demand is most sensitive to weak GDP growth.

Further analysis that we undertook indicates that a 2% slowdown in GDP worldwide cuts global import demand for all oils by 4.21 billion lbs. This equals 2.5% of total world imports of all vegetable oils. This decline is equivalent to over 17% of U.S. total soybean oil output.

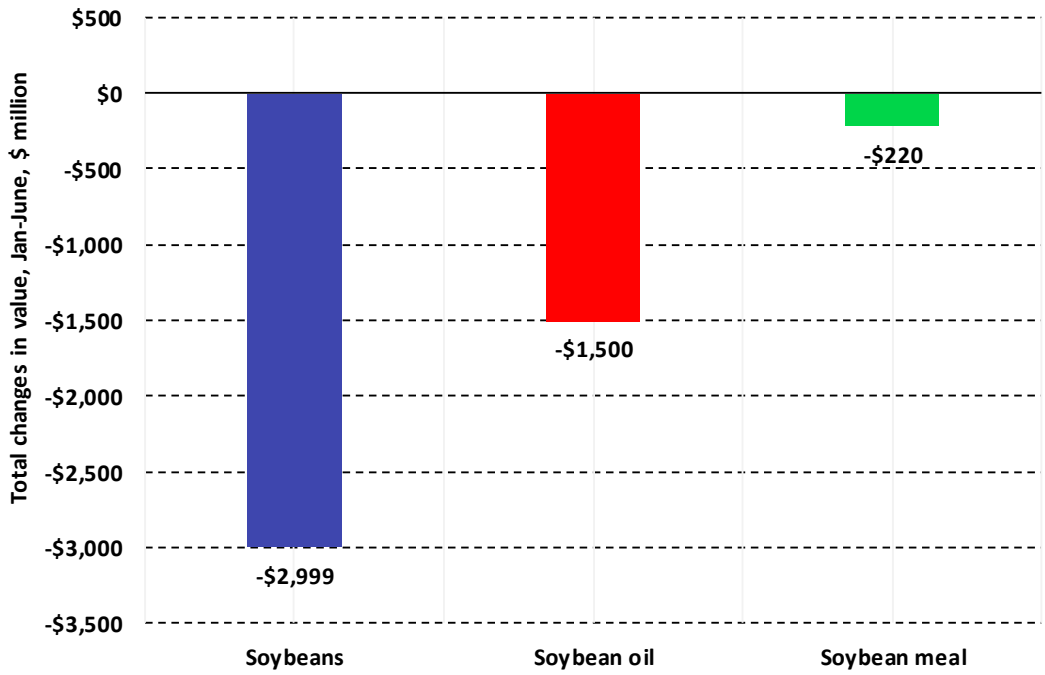
The allocation of the loss of sales value in the 2019/20 market year due to COVID-19, is depicted in Diagrams EXEC.1 and EXEC.2. The loss of value for soybean oil is divided into domestic biodiesel and food & feed end-use sales in Diagram EXEC.1

Diagram EXEC.1: Loss of soybean and soybean product value in domestic sales and exports, in the 2019/20 market year due to COVID-19, $ million



Source: USDA WASDE reports in January and June 2020.

Diagram EXEC.2: Total loss of soybean and soybean product sales value, in the 2019/20 market year due to COVID-19, $ million



Source: USDA WASDE reports in January and June 2020.

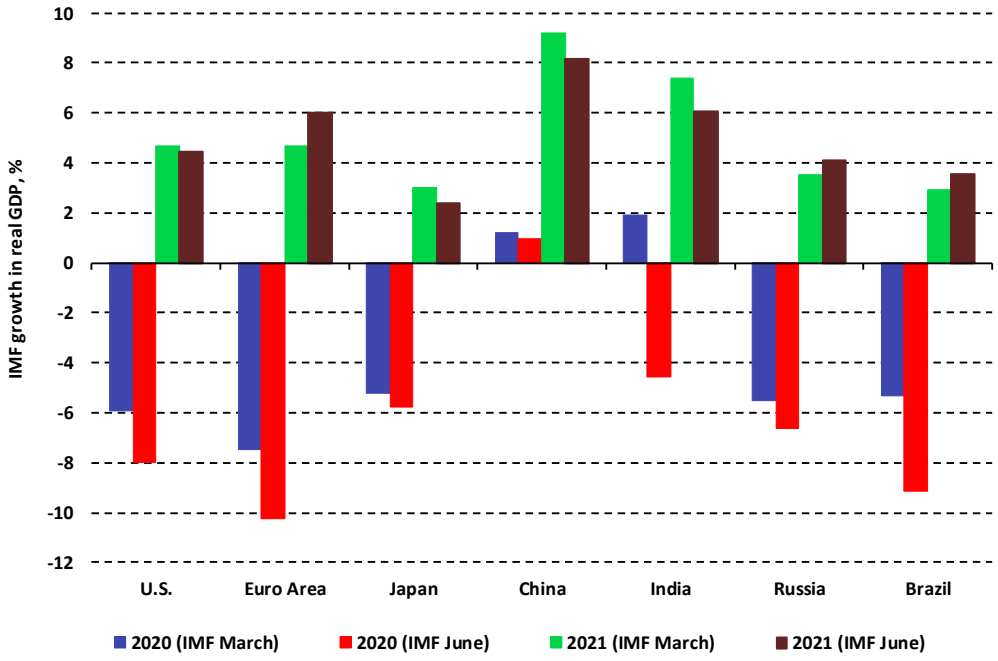
1. The macro-economic impact of COVID-19

The COVID-19 pandemic has had a big impact on global economic activity. The International Monetary Fund in March estimated that it would cause 2020 U.S. GDP to fall 6%, with sharper falls in the Euro Area. Only China and India among the major economies were then expected to record an increase in GDP in 2020.

The IMF downgraded its 2020 forecasts in June. U.S. GDP is now forecast to fall by 8% from 2019, the Euro zone by over 10%, and India by over 4%, leaving only China as an economy with positive, but small, growth. A recovery is expected to occur everywhere in 2021.

Diagram 1 plots the IMF's March and June forecasts for 2020 and 2021 GDP growth for all major economies and illustrates the extent of the contraction expected this year and recovery next year.

Diagram 1: The changes in IMF GDP growth forecasts in 2020 and 2021

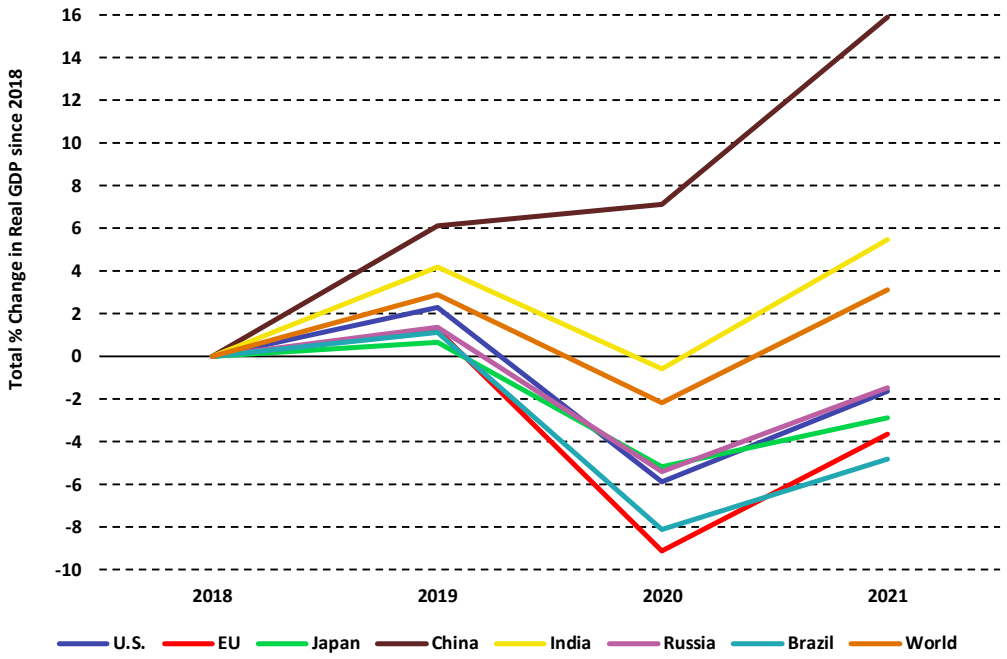


Source: International Monetary Fund, World Economic Outlook March & June 2020.

The growth rates are put into longer term context in Diagram 2. This reveals the overall growth in GDP since 2018 for all the economies in the June figures.

- **<u>Conclusion</u>: Only China and India among individual economies are forecast to have higher GDP in 2021 than in 2018, though the contribution of China to the world total is sufficient to pull global GDP above its 2018 level by 2021.**
- **U.S. GDP is expected to stand 2% below its 2018 figure in 2021.**

Diagram 2: The implications for cumulative growth in GDP since 2018

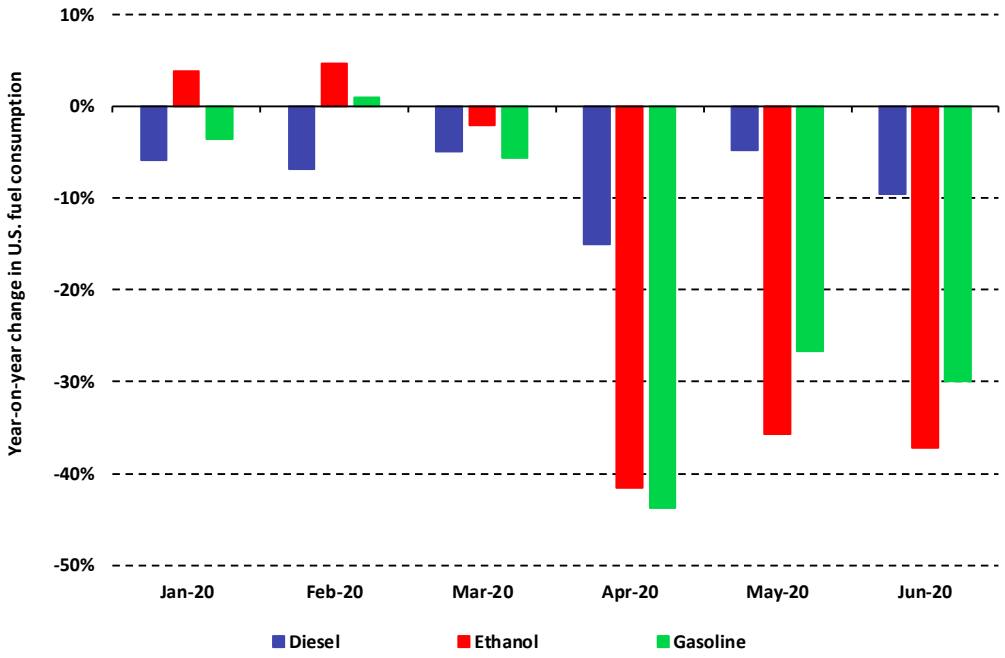


Source: International Monetary Fund, World Economic Outlook June 2020.

2. The direct impact of COVID-19 on U.S. fuel and biofuel demand

The pandemic affected three economic sectors immediately: the transportation, hospitality and food service industries. Diagram 3 depicts the changes in monthly U.S. transportation fuel demand from their 2019 volumes, distinguishing between diesel, gasoline and ethanol use.

Diagram 3: Year-on-year changes in U.S. fuel use



Source: U.S. Energy Information Administration (EIA) Weekly Reports on Transportation Fuel Consumption.

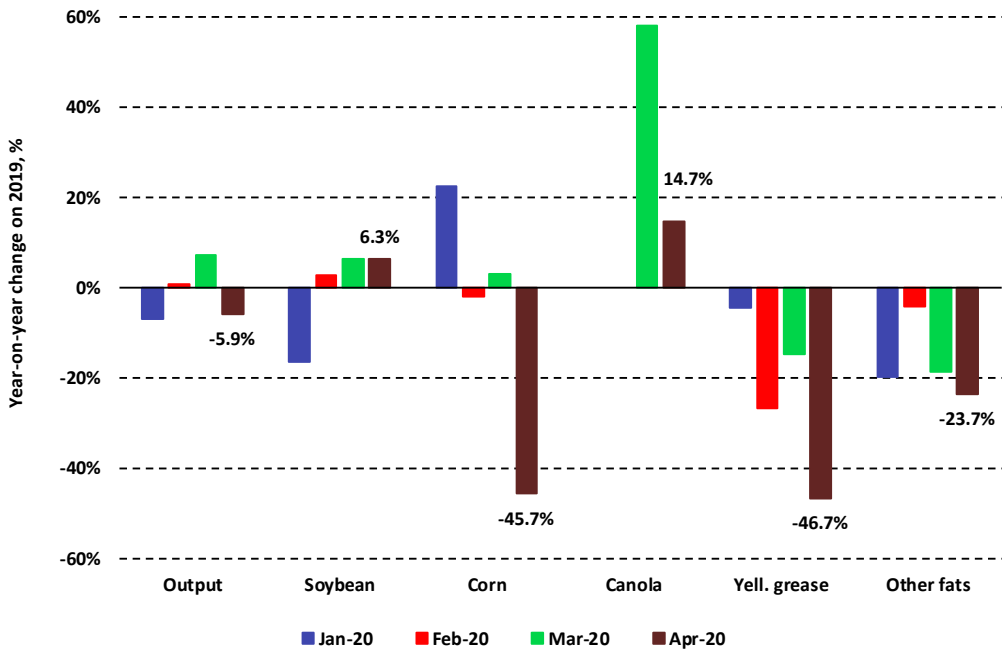
The continued demand for heavy vehicle transportation during COVID-19 lockdowns protected diesel demand from the steep declines recorded in U.S. gasoline and ethanol use. The steepest falls were in April, but declines continued through June, when diesel use was still almost 10% below 2019.

The year-on-year changes in U.S. biodiesel output and in the use of different feedstocks are plotted in Diagram 4. The latest month for which data are available is April and the changes from April 2019 are listed in the diagram.

The overall U.S. output of biodiesel was 5.9% below the 2019 figure. Among the different feedstocks, the pattern varied widely. Yellow grease (from recycled cooking oil, a by-product of catering) was down by almost 47%, and the use of technical corn oil (derived as a by-product from corn ethanol production) was down almost 46%. Consumption of other fats (primarily animal fats, such as tallow and lard, derived from meat packers and renderers) were down almost 24%.

By contrast, both soybean and canola oil use increased year-on-year in April, by 6.3% in the case of soybean oil, to fill the gaps left by the shortfall in corn oil, yellow grease and animal fat availability.

Diagram 4: Year-on-year changes in U.S. biodiesel feedstock use



Source: U.S. EIA Reports on Biodiesel Feedstocks.

- **<u>Conclusion</u>: U.S. diesel fuel demand has been less badly hit during the COVID-19 lockdown than gasoline demand. Biodiesel output was reduced by the weakness of diesel sales.**
- **However, among the feedstocks for biodiesel, soybean oil demand was insulated from the overall decline in biodiesel production, as soybean oil was used to offset the loss of supplies of other oils and fats as a direct result of the contraction that occurred in other processing sectors.**

3. COVID-19 and U.S. livestock production and soybean crushing

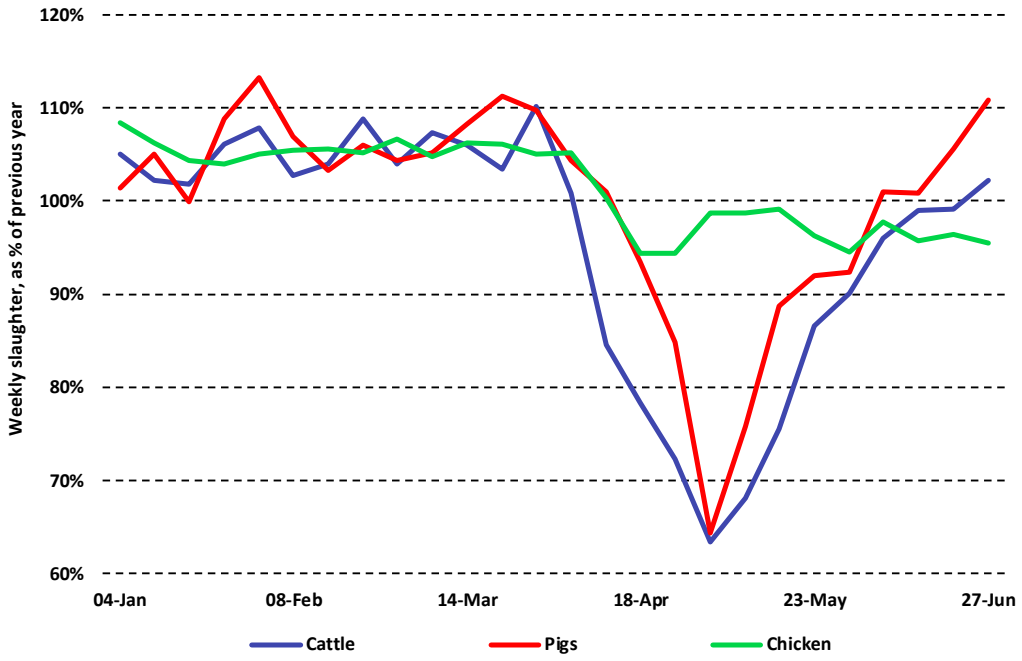
The main end-use for soybean products is as protein meal for the feed in the livestock sector. Diagrams 6 and 7 indicate how weekly slaughter rates for the main livestock sectors, namely cattle, pigs and chickens, as well as the weekly output of eggs, the placing of young chickens and the birth rates of piglets, compared with the volumes in the corresponding weeks of 2019. Appendix B presents similar detailed information for China.

With the exception of piglets, where the feedback from changes in demand to changes in numbers takes longer, all livestock activities suffered a sharp decline in April-May, with the low point in early May. By June, these livestock operations were generally back to their 2019 levels, or slightly ahead.

The official USDA NASS data on monthly oilseed crushing tonnages are available only through May, but Diagram 7 demonstrates that May's weakness of activity in the livestock sector pulled U.S. soybean crushing volumes that month below its level in April (where the changes are shown as three-month moving averages to smooth the curves and make them easier to interpret).

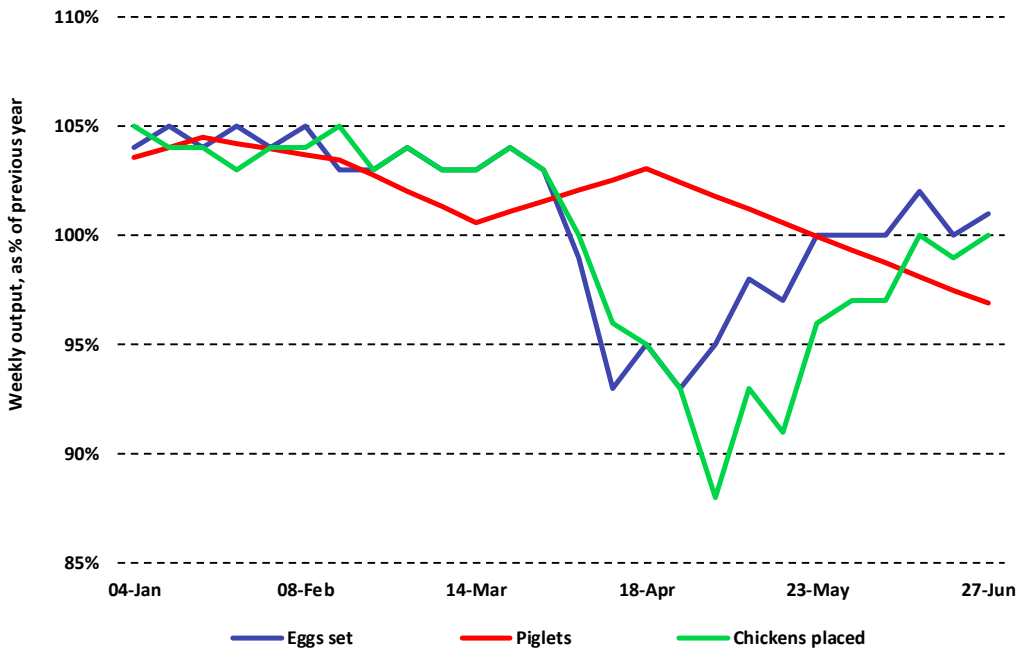
- **<u>Conclusion</u>: Soybean meal demand depends on activity in the U.S. livestock industry, which was hit in April, but then recovered in May. This affected all the major meat sectors, as well as the production of eggs.**
- **The monthly U.S. crush of soybeans also recorded month-on-month declines in May, as a quick reaction to the slowdown anticipated in the demand for soybean meal from livestock producers.**

Diagram 5: Year-on-year changes in U.S. meat output



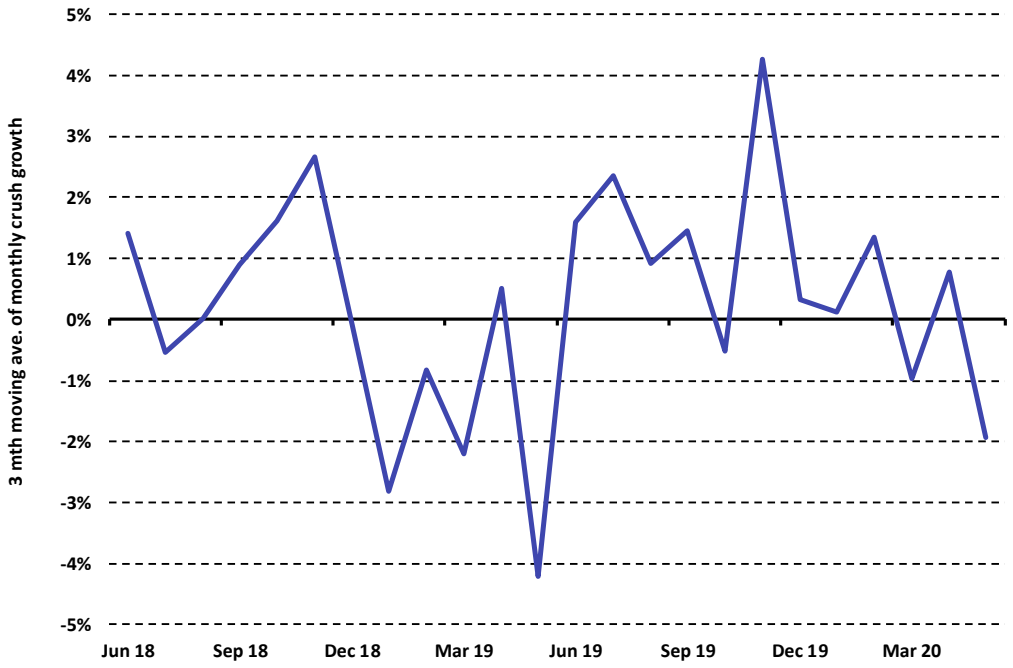
Sources: USDA AMS Market News Miscellaneous Poultry & Meat Production.

Diagram 6: Year-on-year changes in U.S. chicken, piglet and egg output



Sources: LMC analysis of USDA ERS Broiler Hatchery and USDA NASS Hogs & Pigs Reports.

Diagram 7: Monthly growth in U.S. soybean crushing, June 2018-May 2020



Source: USDA NASS Oilseed Crushings, Production, Consumption and Stocks.

Note: The changes in crushing volumes from the previous month are plotted as three-month moving average to smooth the series and make the underlying trends clearer.

4. The loss of value to the U.S. soybean sector due to COVID-19

The USDA monthly WASDE reports provide estimates, by marketing year, of U.S. domestic supply-demand balances for soybeans and soybean products, as well as estimates of the average prices received by soybean farmers and by soybean crushers for soybean oil and meal sales in the year.

Appendix A describes the changes that occurred between January and June 2020 in WASDE projections of 2019/20 output, sales and prices of soybean products.

Appendix A indicates that changes in domestic sales volumes are concentrated in soybean oil deliveries, with exports and end-year stocks rising to absorb the oil available from crushers.

The WASDE reports' estimates of selling prices over the full marketing year provide a guide to the WASDE valuation of output over the year.

Table 1 reveals the result of multiplying the average prices projected in January and June by the sales volumes predicted in the same months to derive the value of soybean product sales from crushers and the value of the soybeans sold by U.S. farmers.

The decline in value, which is depicted in Diagram 8, is interpreted as the loss of value due to COVID-19.

The loss of sales value due to COVID-19 between January and June 2020 is detailed in Table 1. The loss of value on total sales (excluding changes in stocks), derived entirely from detailed estimates published by USDA WASDE, may be summarized as follows:

Conclusion from Table 1: The loss of value due to COVID-19 was estimated to be:

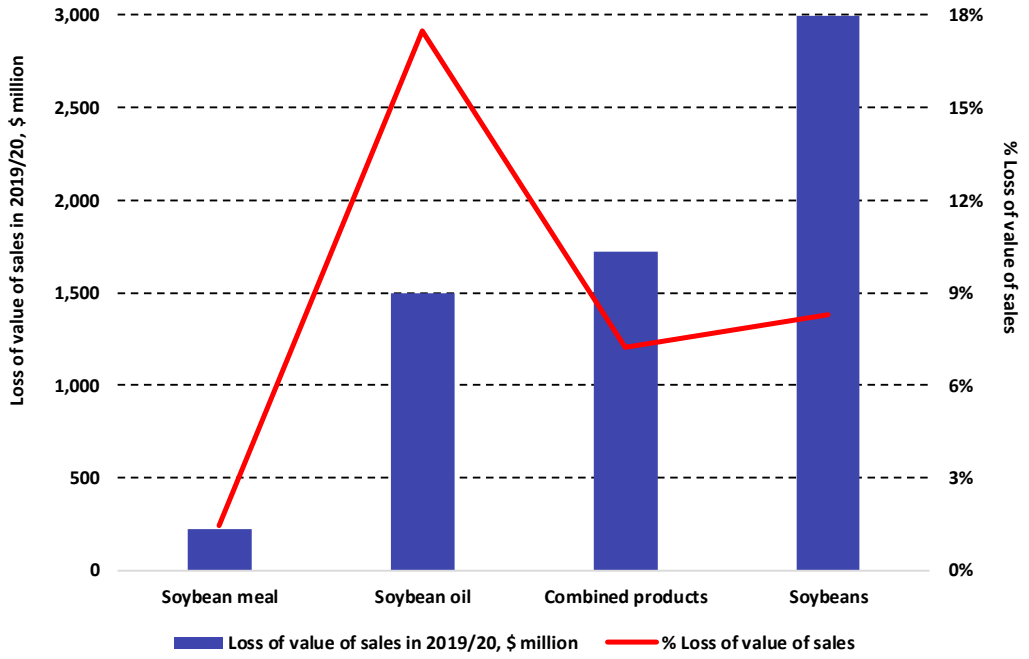
- **$220 million on soybean meal, a 1.4% decline in value;**
- **$1,500 million on soybean oil, a 17.5% decline in value;**
- **A total of $1,720 million on the two products combined, a 7.2% decline in value;**
- **$2,999 million on soybean sales, an 8.3% decline in value.**

Table 1: Loss of value due to COVID-19 in the 2019/20 market year between January and June 2020 on sales by U.S. soybean producers and crushers, $ million

	Value in $ million		Loss of value due	Loss of value
Date of estimate	Jan-20	Jun-20	to COVID-19	as a %
Soybean meal	15,250	15,030	220	1.4%
Soybean oil	8,568	7,068	1,500	17.5%
Combined products	23,818	22,098	1,720	7.2%
Soybeans	36,072	33,074	2,999	8.3%

Sources: Derived from USDA World Agricultural Supply and Demand Estimates (WASDE) reports in January and June 2020.

Diagram 8: Loss of value to U.S. soybean crushers and farmer suppliers between January and June 2020 due to COVID-19, in $ million in 2019/20



Source: USDA WASDE reports in January and June 2020.

5. Sensitivity of world demand to different GDP growth rates

The analysis of the impact of COVID-19 on demand for soybean products suggests that the product that has borne the brunt of decline in demand due to lower economic activity is oil. Table 2 draws upon LMC's model of global demand for oilseed products to determine the decline in vegetable oil imports, of all oils, and not just soybean oil, if GDP everywhere falls 2%, i.e., from 3% global growth in 2021 (as in the latest IMF forecast) to just 1%.

- **<u>Conclusion</u>: Table 2 reveals that a 2% slowdown in GDP cuts world import demand for all oils by 4.21 billion lbs. This equals 2.5% of total imports of all oils.**
- **Putting this loss of import markets into a U.S. context, this decline is equivalent to over 17% of U.S. total soybean oil production.**

Table 2: Decline in vegetable oil imports as a result of 2% lower GDP growth, based on 2019/20 USDA PSD estimates made in June (billion lbs)

	Billion lbs decline in imports			% share of
	Food use	Non-food use	**Total**	world imports
World	2.58	1.63	**4.21**	2.50%
Asia	*1.80*	*1.26*	***3.07***	
Latin America	*0.48*	*0.22*	***0.71***	
Others	*0.29*	*0.14*	***0.44***	

Source: LMC analysis of the global market for oilseed products.

Appendix A: WASDE Forecasts in January and June 2020

The USDA World Agricultural Supply and Demand Estimates (WASDE) forecasts are updated each month and cover the current marketing year, and as the next marketing year approaches, are extended for this following year, too.

The revisions to the forecasts take account of changes that occur each month in the USDA's detailed projections, using reports from USDA FAS Agricultural Attachés as a basis for estimates of global demand and trade. Therefore, a comparison of the January and June 2020 WASDE reports provides an excellent independent assessment of the changes in the supply-demand outlook between those dates, in which the one major external event that will have altered projections was the arrival of COVID-19.

Changes in WASDE forecasts of the U.S. supply-demand balance

Tables A1-A3 in this Appendix summarize the WASDE forecasts of U.S. soybean, soybean meal and soybean oil supply-demand in the January and June 2020 reports. The main changes that did occur in these forecasts over this period were:

- For U.S. soybean supply-demand, 2019/20 marketing year output figures barely changed. This was no surprise since the crop was known by January.
  - Crushing rose slightly; export forecasts fell, presumably a result of weaker overseas demand; and end-stocks rose as a consequence.
- For U.S. soybean meal supply-demand, output rose, as crushing increased.
  - U.S. disappearance also rose. This was a consequence of the decline in corn ethanol demand, which reduced the dry milling of corn and therefore also supplies of distillers' dried grain, the second largest source of vegetable protein meal after soybean meal. Soybean meal made up for the shortfall.
  - U.S. soybean meal exports and end-stocks both changed little.
- For U.S. soybean oil supply-demand, output rose slightly, as crushing increased.
  - U.S. disappearance for biodiesel manufacture fell in response to the decline in overall diesel fuel use.
  - U.S. disappearance in food products, also fell, declining by 2% between the January and June WASDE estimates.
  - Exports of soybean oil rose by 1.0 billion lbs between the two reports, which represented an increase in estimates of almost 60% from January to June.
  - This implied that U.S. soybean exporters had to develop new, less profitable, markets to which to sell the larger export quantities, and this was undoubtedly one factor behind the fall in the domestic U.S. soybean oil price, as the lower FOB U.S. Gulf prices needed to make such sales were transmitted to local U.S. markets.
  - In spite of the large increase in the estimates of U.S. soybean oil exports, the WASDE estimates of the end-stocks of soybean oil were also increased significantly between the January and June reports.

Table A1: WASDE forecasts of U.S. soybean supply-demand, January and June 2020, million bushels

	Jan-20	Jun-20	Change
Output	3,558	3,552	-6
Crushing	2,105	2,140	35
Export	1,775	1,650	-125
End-Stocks	475	585	110

Sources: USDA WASDE reports in January and June 2020

Table A2: WASDE forecasts of U.S. soybean meal supply-demand, January and June 2020, million tons

	Jan-20	Jun-20	Change
Output	49,498	50,323	825
Disappearance	36,800	37,500	700
Export	13,200	13,450	250
End-Stocks	400	375	-25

Sources: USDA WASDE reports in January and June 2020.

Table A3: WASDE forecasts of U.S. soybean oil supply-demand, January and June 2020, million lbs

	Jan-20	Jun-20	Change
Output	24,420	24,590	170
Biodiesel	8,500	7,400	-1,100
Food etc.	15,000	14,700	-300
Export	1,700	2,700	1,000
End-Stocks	1,446	1,940	494

Sources: USDA WASDE reports in January and June 2020.

- **<u>Conclusion</u>: The components of the U.S. supply-demand balance for both soybean and soybean meal have been little affected by the arrival of COVID-19.**
- **The WASDE analysis implies that the main blow has fallen on soybean oil, whose domestic disappearance for both biodiesel and, to a lesser extent, food use has been harmed.**
- **With crushing volumes maintained, the loss of domestic disappearance of soybean oil led to a rise in end-stocks and projections of a sharper rise in export volumes.**

Changes in USDA PSD forecasts between January and June 2020 of world soybean product and other major vegetable oil imports

The USDA Production, Supply & Distribution (PSD) database provides a great deal of background detail to the WASDE data and forecasts by country and product. Tables A4- A6 describe changes between the January and June 2020 PSD forecasts in global imports of soybeans and soybean products. The soybean forecasts also cover 2020/21 imports in both monthly updates. As soybean oil is just one part of a broader vegetable oils sector, Table A6 includes data on the WASDE estimates of imports of the other major vegetable oils.

- For world soybean imports, Table A4 makes a distinction between China and Rest of the World, and that in turn is divided between Argentina/Canada and Others.
  - For China, the import forecasts were increased significantly during the early months of 2020 for both soybean marketing years, implying minor reductions between January and June in the forecasts of Rest of World imports in both the 2019/20 and 2020/21 marketing years.
  - The January projections were prepared once COVID-19 had taken hold in China, and therefore, the January forecasts were based on a very bleak assessment of its impact. By June, the prospects appeared much brighter.
  - Argentina and Canada are mentioned separately because they are net exporters of soybeans, but they also import beans on a small scale for local crushing.
  - Soybean imports into “Others” are similar in January and June estimates.
  - Other than China, which is unpredictable as an export market for soybeans in current circumstances and where COVID-19 was already factored into the January figures, it appears that COVID-19 has had little effect upon import demand for soybeans from the U.S. and elsewhere.
- For world soybean meal imports, Table A5 divides the flows into those to the EU and those to the Rest of the World.
  - For both the EU and the Rest of the World, there was a small decrease, of the order of 2%, in the estimates of 2019/20 imports between the January and June sets of projections.
  - As was the case with soybeans for the world outside China, it seems from the detailed USDA PSD forecasts that COVID-19 has had little effect upon import demand for soybean meal from the U.S. and elsewhere.
- For world soybean oil and other vegetable oil imports, Table A6 divides the flows between those to India, the largest importer, and those to the Rest of the World.
  - In step with the downgrading of soybean oil disappearance in the U.S., global imports of both soybean oil and the other major oils were lowered by 6% on average between the January and June forecasts.

Table A4: Forecasts of world soybean imports in 2019/20-2020/21, billion bushels

	Bean imports 2019/2020			Bean imports 2020/2021	
	Jan	June		Jan	June
China	3,033	3,380	China	3,123	3,527
Rest of World	2,330	2,253	Rest of World	2,313	2,279
Argentina/Canada	*279*	*156*	*Argentina/Canada*	*176*	*152*
Others	2,051	2,097	Others	2,137	2,126

Note: Derived from USDA PSD projections in January and June 2020.

Table A5: Forecasts of world soybean meal imports in 2019/20, million tons

	Jan	June
EU	20.9	20.4
Rest of World	50.3	49.4

Note: Derived from USDA PSD projections in January and June 2020.

Table A6: Forecasts of world soybean oil and other major vegetable oil imports in 2019/20-2020/21, billion lbs

	Soy oil imports 2019/2020			Palm, rapeseed, sun oil imports	
	Jan	June		Jan	June
India	7.7	7.1	India	27.9	25.8
Rest of World	17.8	16.7	Rest of World	119.8	113.1
World	25.5	23.7	World	147.7	138.8

Note: Derived from USDA PSD projections in January and June 2020.

- **<u>Conclusion</u>: In a similar manner to the domestic U.S. soybean supply-demand balance, the global import picture is broadly speaking one in which the impact of COVID-19 on imports of soybeans and of soybean meal is viewed as very limited.**
- **The segment that has been affected significantly is global soybean oil imports, and this is in line with the pattern for other vegetable oils, for which world import demand is projected to be reduced by 6-7% in all.**
- **The exception to this broad conclusion is in USDA PSD estimates of China's 2019/20 soybean imports, which were lifted by well over 10% between January and June. The reason for this dramatic change was that COVID-19 had already hit China in January and the estimates at that time reflected the prevailing pessimism then. The subsequent rapid recovery in China led to the upward revision in Table A4.**