United States Department of Agriculture

Agricultural Marketing Service

Ukraine Grain Transportation

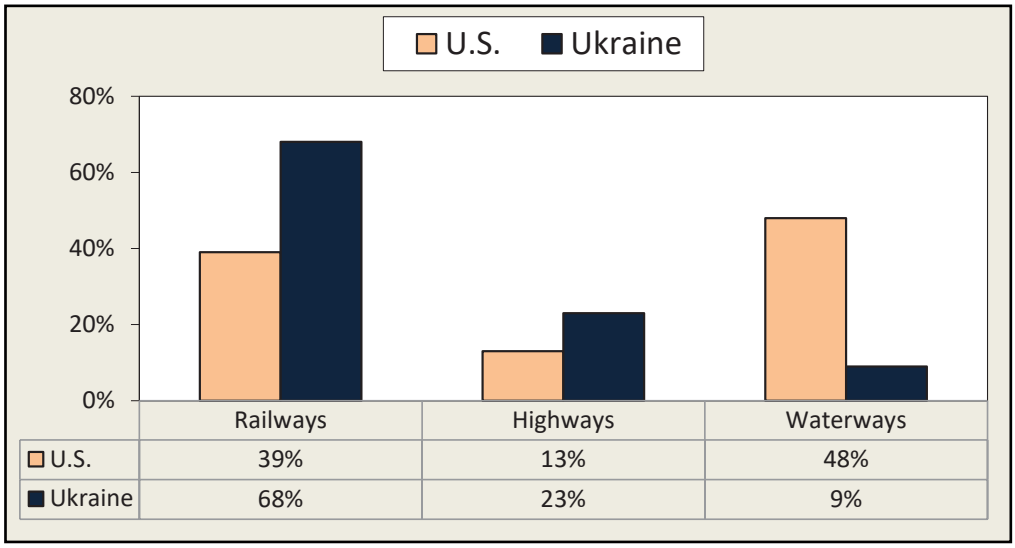
Published March 17, 2020

USDA is publishing the Ukraine Grain Transportation to provide an indicator report to evaluate the Black Sea Region's Grain Transportation. Initial interest came from a September 2018 meeting of the BNSF Agriculture Rail Business Council (ARB)[1], in which grain producers requested that USDA assess U.S. grain transportation cost competitiveness, especially for wheat and corn. Interest levels during a session on this topic at USDA's 2020 Agricultural Outlook Forum confirmed that this report will likely be useful to U.S. grain producers**.**

Why are U.S. grain producers interested in this region? The Black Sea region–Kazakhstan, Russia, and Ukraine–is a strong player in the global wheat market. Black Sea wheat successfully competes on the basis of lower prices, favorable exchange rates, and the region's advantageous location (FAS, Grain: World Market and Trade January 2018). Ports on the Black Sea have easy access to the rapidly growing markets in the Middle East and North Africa where wheat and feed demand has grown. The U.S. share of the global wheat market has been declining as the European Union (EU) and Russia have risen in prominence. Globally, wheat is mainly used for human consumption. But Ukraine exports wheat both for milling and feed. Russia is the top wheat exporter, followed by the EU, United States, Canada, Ukraine, Australia, and Argentina.

In the corn market, the United States is still the leading exporter, but faces strong competition from Brazil, Argentina, and Ukraine. U.S. corn prices are still competitive, but Black Sea prices are declining and production is increasing (FAS, Grain Market and Trade February 2019). The U.S. Department of Agriculture forecasts that Ukraine is expected to grow as a major corn exporter, reaching shipments of 31.2 million metric tons (mmt) in 2029. Corn is mainly used for feed in the Middle East and North Africa. Because of challenges obtaining specific data from the full Black Sea region, Ukraine is being used as a proxy for the entire region.

Figure 1. U.S. and Ukrainian grain and oilseeds exports by mode, 2019



	Railways	Highways	Waterways
U.S.	39%	13%	48%
Ukraine	68%	23%	9%

Source: USDA, Agricultural Marketing Service, 2016, Ukrzaliznytsia and Ukrainian Sea Ports Authorities, 2019.

Rail

Most Ukrainian grain is transported by rail (68 percent), followed by truck (23 percent) and river (9 percent) (fig. 1). The rail freight market is under Government control.

1 The ARB is a group that BNSF started 13 years ago as a forum for dialogue between producers, co-ops, and other agricultural groups to discuss issues of importance in the BNSF service territory. The ARB group consists of about 25 individuals and meets twice a year.

Ukraine Grain Transportation

Ukrzaliznytsia (UZ), the state-owned rail company, owns the rail infrastructure and provides services. Tariff rates are not published. UZ uses the former Soviet Union's railway-tariff-setting model. Since 2009, the Ministry of Infrastructure updated the rail model without significant changes to the base tariff. Using privately-owned railcars can surpass the cost of using state owned railcars by up to $4.00/metric ton (mt) per 350 miles. When shippers call UZ to get a quote, they have the options of using private railcars and/or railcars in the UZ grain hopper fleet. More than 95 percent of Ukrainian grain exports are via the Black Sea ports (CFTS Consulting 2014).[2]

Trucking

Roads in Ukraine vary in quality from freeways to dirt. All roads are public and toll free. The average truck weighs 40 mt with a maximum cargo of 23-25 mt.[3] Currently, the main challenge is mitigating damage from trucks with overweight cargo (which is, most commonly, grain). The degradation to roads caused by overweight cargo requires substantial funding to repair. In Ukraine, trucks typically deliver grain to port over short distances—up to 124 miles (200 km) in the areas that deliver to the nearest sea ports such as Odesa and Mykolaiv. Freight prices are determined by supply and demand for the transport service.

Barge

As in many other parts of the world, barge is considered to be the most economical means of moving bulk commodities in Ukraine. However, Ukrainian navigable waterways currently cover only a part of the country, which limits the potential of river transportation. At present, three rivers are used for cargo transportation: the Dnipro, Southern Bug, and Danube. The Dnipro river (627 miles/1,009 km) is the main route competing with other transport modes for cargo flow. The Ukrainian part of the Danube (106 miles /171 km) is short, located along the border with Romania, and used for international shipments only. The navigable part of the Southern Bug is also very short (124 miles/200 km) and has no adequate transshipment facilities. Currently, only one company uses the Southern Bug for grain delivery from its terminal to the port of Mykolaiv.

Figure 2. Ukrainian river cargo volume, 2013-19

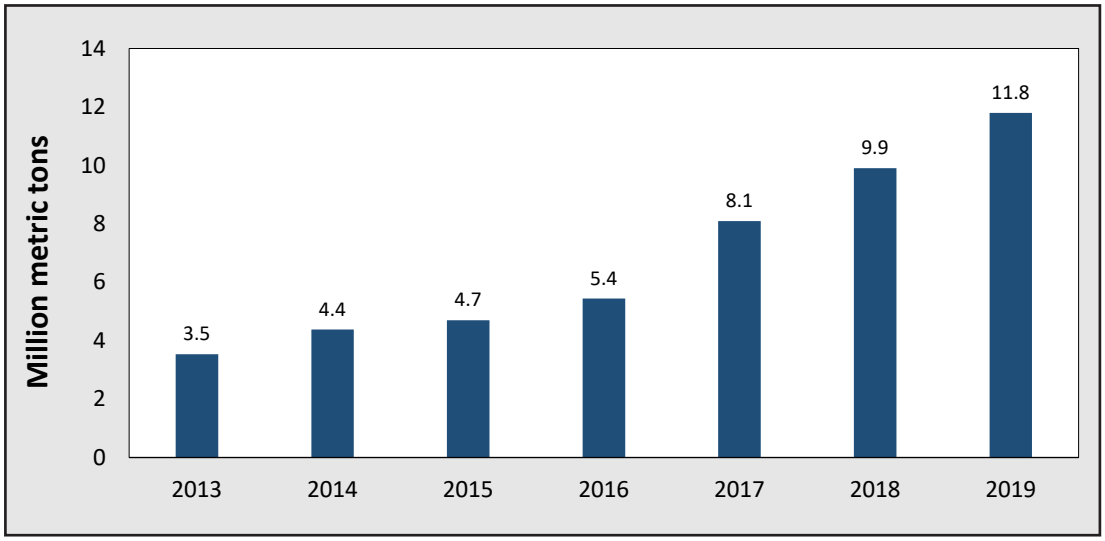


Figure 2 shows the growth rate of barge transportation, which has increased significantly from 3.5 mmt to 11.8 mmt. Within the next decade, river cargo volume is expected to surpass the infrastructure capacity. Built in the middle of the 20th century, it requires substantial funding for repair and maintenance.

Source: Ukrainian Sea Ports Authority.

2 The Ukrainian Black Sea Region includes the ports of Odesa, Chornomorsk, Yuzhnyi, Bilhorod-Dnistrovskyi, Izmail, Reni, Ust-Dunaisk, Skadovsk, Olviia, Mykolaiv, and Kherson. It does not include the ports in occupied Crimea (Yevpatoriia, Kerch, Sevastopol, Feodosiia, and Yalta).

3 The truck weighs 15-17 mt plus a cargo of 23-25 mt = approximately 40 mt.

Ukraine Grain Transportation

This *Ukraine Grain Transportation Report* is an indicator designed to better understand the freight market in Ukraine. The indicator shows the cost of shipping wheat, corn, and soybeans from major production regions in Ukraine to the ports and then to major export markets. The indicator comprises 3 regions in 24 provinces and represents roughly 100 percent of the total 2018 Ukrainian wheat, corn, and soybean production (see fig. 3 inside the report). These are the latest official statistical data available and follow the classification used by the State Statistics Service of Ukraine. Analysis of origins and destinations resulted in six routes (figs. 3-6 and tables 1-3 in the report). For this report, the ports of Odesa and Mykolaiv were selected as the major export-originating points for shipments to Egypt, Indonesia, and China (table 5).[4] The ocean freight prices from the "Centre for Transport Strategies (CFTS)" correspond to actual values negotiated between shippers and carriers. These were averaged according to the weights of the shipped volumes. Rail rates were estimated using specialized software "TM-Karta" in accordance with UZ tariff regulation. Truck rates were estimated based on the market data for various ranges (100 miles and 30 miles) obtained from service providers. For more information, contact Delmy L. Salin at delmy.salin@usda.gov, Andrii Shkliar at andrii.shkliar@cfts.org.ua, and Andrey Isayev at andrey.isayev@cfts.org.ua.

4 The ocean freight rates and transshipment costs for Odesa and Mykolaiv are typical of the rates and costs for the majority of the ports.

Ukraine Grain Transportation

Figure 3. Routes[1] and wheat, corn, and soybean regions considered in the Ukrainian grain export transportation indicator[2]

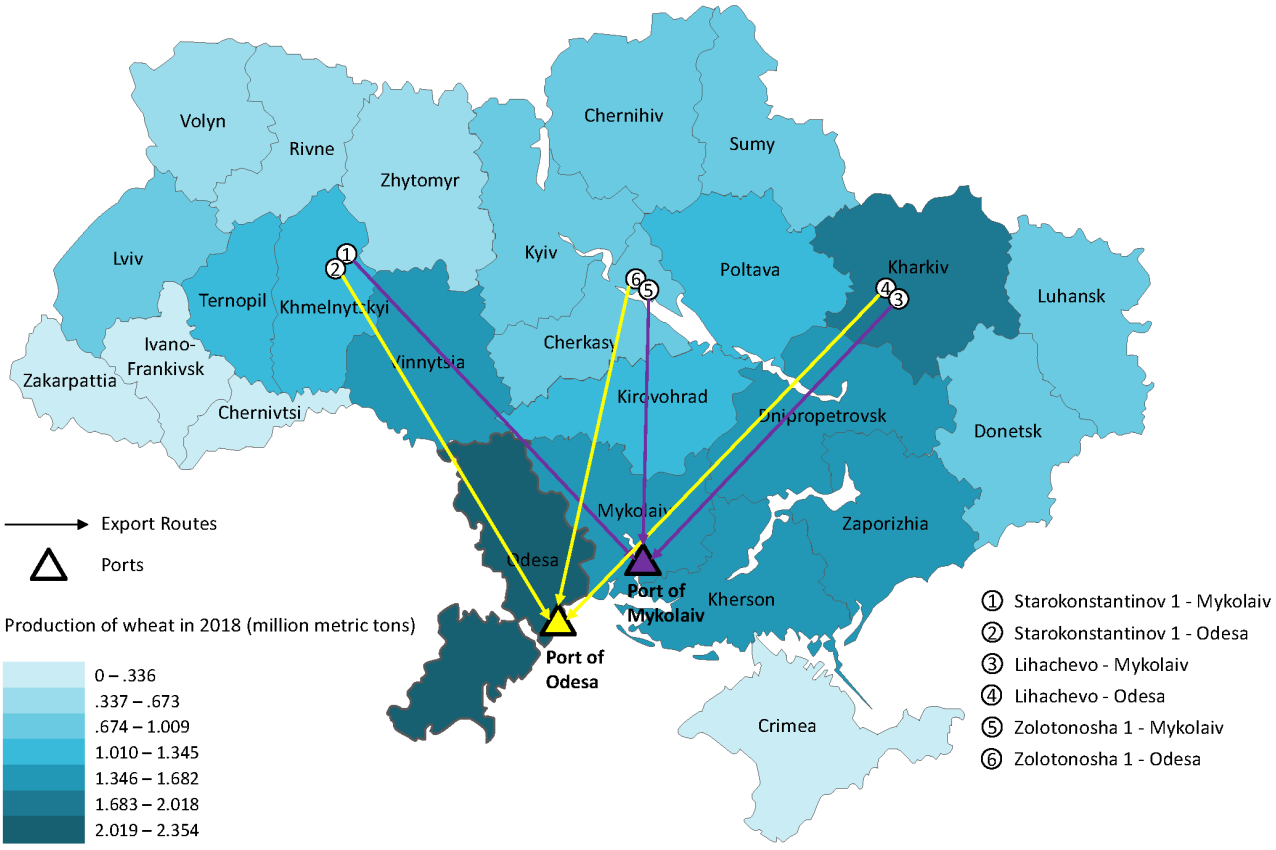
[1]Table defining routes by number is shown on page 10.

[2]Regions comprised roughly 100 percent of wheat, corn, and soybean production, 2018.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Ukraine Grain Transportation

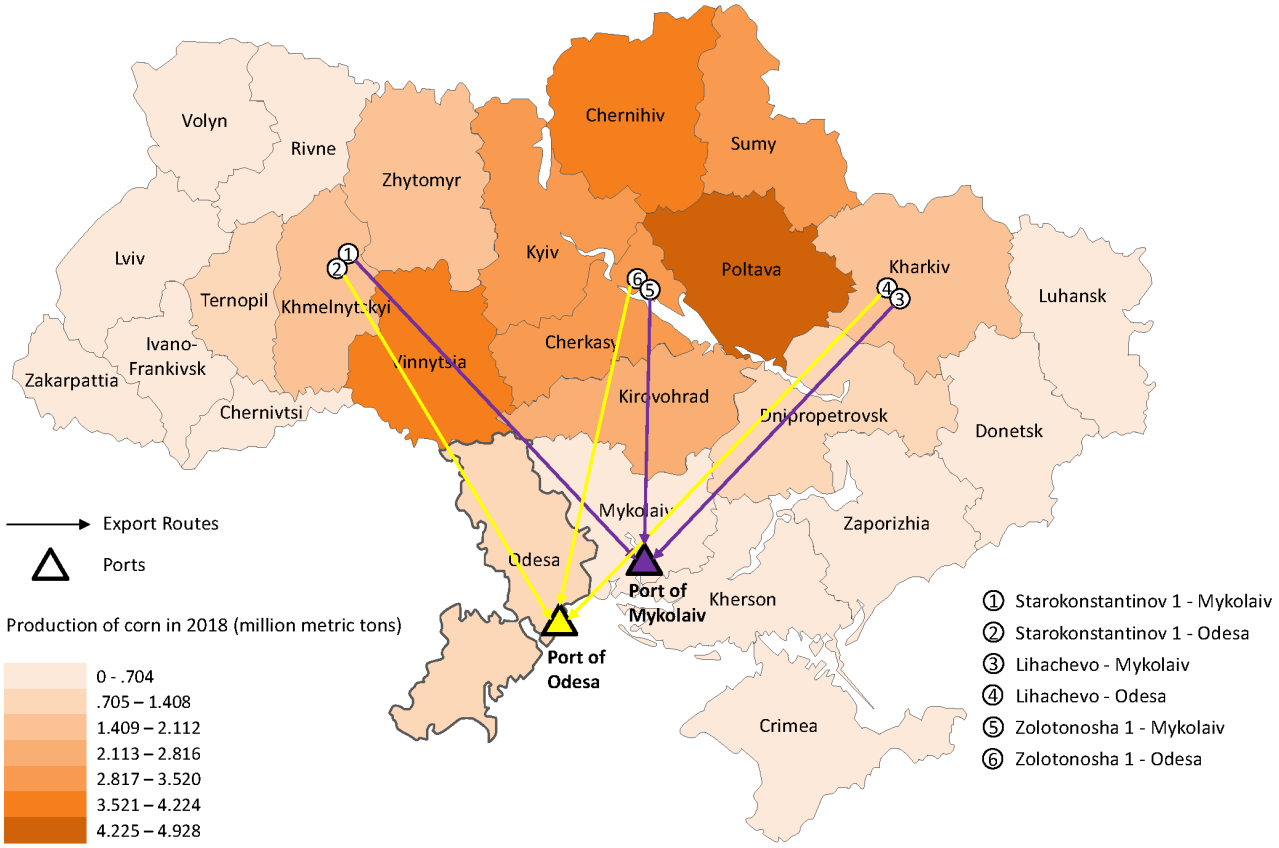
Figure 4. Routes[1] and wheat regions considered in the Ukrainian grain export transportation indicator[2]



[1]Table defining routes by number is shown on page 10.
[2]Regions comprised roughly 100 percent of wheat production, 2018.
Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Ukraine Grain Transportation

Figure 5. Routes[1] and corn regions considered in the Ukrainian grain export transportation indicator[2]

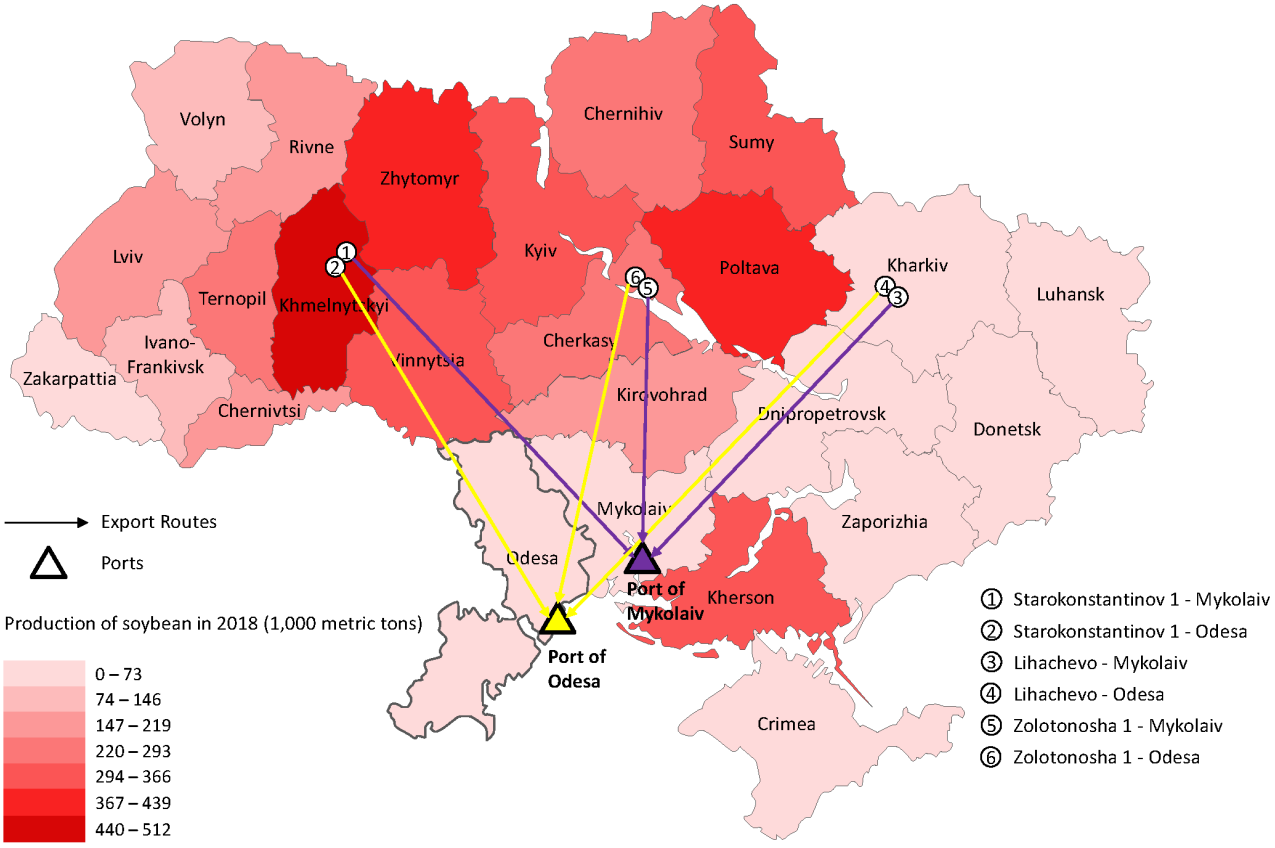


[1]Table defining routes by number is shown on page 10.

[2]Regions comprised roughly 100 percent of corn production, 2018.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Figure 6. Routes[1] and soybean regions considered in the Ukrainian grain export transportation indicator[2]



[1]Table defining routes by number is shown on page 10.
[2]Regions comprised roughly 100 percent of soybean production, 2018.
Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Ukraine Grain Transportation

Table 1. Quarterly costs of transporting Ukrainian wheat from the Black Sea ports to Egypt and Indonesia

	2019 3rd qt	2019 4th qtr	Average 2019	2019 3rd qtr	2019 4th qtr	Average 2019
	To Alexandria, Egypt					
	Central Ukraine[1] - Odesa[2] —US$/mt—			Central Ukraine[1] - Mykolaiv[2] —US$/mt—		
Truck	6.65	9.57	8.11	6.65	9.57	8.11
Rail[3]	14.17	14.85	14.51	10.64	11.14	10.89
Ocean	14.58	14.08	14.33	16.33	15.83	16.08
Total transportation	35.41	38.51	36.96	33.62	36.55	35.08
Farm price[4]	183.65	184.87	184.26	183.65	184.87	184.26
Landed cost	219.06	223.37	221.22	217.27	221.42	219.34
Transport % of landed cost	16.2	17.2	16.7	15.5	16.5	16.0
	To Ciwandan/Cigading, Indonesia					
	Central Ukraine[1] - Odesa[2] —US$/mt—			Central Ukraine[1] - Mykolaiv[2] —US$/mt—		
Truck	6.65	32.65	19.65	6.65	9.57	8.11
Rail[3]	14.17	14.85	14.51	10.64	11.14	10.89
Ocean	38.17	33.83	36.00	39.92	35.58	37.75
Total transportation	58.99	81.34	70.17	57.20	56.30	56.75
Farm price[4]	183.65	184.87	184.26	183.65	184.87	184.26
Landed cost	242.64	266.21	254.43	240.85	241.17	241.01
Transport % of landed cost	24.3	30.6	27.4	23.7	23.3	23.5

[1]Central Ukraine producing region = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.
[2]Export ports.
[3]Rail rates include the cost of delivery to the railway station and the cost of grain hopper rent but do not include movement and positioning of rail cars at the elevator and at the port, railway station fees, security service from loading to discharging port, and freight forwarding service, which could exceed the rail tariff rate. Rail rates are estimated by using specialized software "TM-Karta" in accordance with Ukrzaliznytsia (UZ) tariff regulation.
[4]Farm price = elevator price − handling costs − farm to elevator transportation.
Note: qtr = quarter. mt = metric ton.
Source:Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Ukraine Grain Transportation

Table 2. Quarterly costs of transporting Ukrainian corn from the Black Sea ports to Egypt and China

	2019 3rd qt	2019 4th qtr	Average 2019	2019 3rd qtr	2019 4th qtr	Average 2019
	To Alexandria, Egypt					
	Central Ukraine[1] - Odesa[2] —US$/mt—			Central Ukraine[1] - Mykolaiv[2] —US$/mt—		
Truck	6.65	9.57	8.11	6.65	9.57	8.11
Rail[3]	14.17	14.85	14.51	10.64	11.14	10.89
Ocean	14.58	14.08	14.33	16.33	15.83	16.08
Total transportation	35.41	38.51	36.96	33.62	36.55	35.08
Farm price[4]	155.52	145.84	150.68	155.52	145.84	150.68
Landed cost	190.93	184.35	187.64	189.14	182.39	185.77
Transport % of landed cost	18.5	20.9	19.7	17.8	20.0	18.9
	To Shanghai, China					
	Central Ukraine[1] - Odesa[2] —US$/mt—			Central Ukraine[1] - Mykolaiv[2] —US$/mt—		
Truck	6.65	9.57	8.11	6.65	9.57	8.11
Rail[3]	14.17	14.85	14.51	10.64	11.14	10.89
Ocean	35.33	33.50	34.42	38.08	36.25	37.17
Total transportation	56.16	57.93	57.04	55.37	56.97	56.17
Farm price[4]	155.52	145.84	150.68	155.52	145.84	150.68
Landed cost	211.68	203.77	207.72	210.89	202.81	206.85
Transport % of landed cost	26.5	28.4	27.5	26.3	28.1	27.2

[1]Central Ukraine producing region = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.
[2]Export ports.
[3]Rail rates include the cost of delivery to the railway station and the cost of grain hopper rent but do not include movement and positioning of rail cars at the elevator and at the port, railway station fees, security service from loading to discharging port, and freight forwarding service, which could exceed the rail tariff rate. Rail rates are estimated by using specialized software "TM-Karta" in accordance with Ukrzaliznytsia (UZ) tariff regulation.
[4]Farm price = elevator price − handling costs − farm to elevator transportation.
Note: qtr = quarter. mt = metric ton.
Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Ukraine Grain Transportation

Table 3. Quaterly rail rates for selected Ukrainian grain export transportation routes, 2019

Route #	Origin (reference city)[1]	Destination	Distance (miles)	Share (%)[2]	Freight Price (US$/mt/100 miles)[3]				
					1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
1	Western Ukraine (Khmelnitskii, station Starokonstantinov[1])	Mykolaiv	501	30			3.87	4.06	3.97
2	Western Ukraine (Khmelnitskii, station Starokonstantinov[1])	Odesa	343				4.13	4.33	4.23
3	Eastern Ukraine (Kharkiv, station Lihachevo)	Mykolaiv	340	16			4.17	4.37	4.27
4	Eastern Ukraine (Kharkiv, station Lihachevo)	Odesa	521				3.75	3.93	3.84
5	Central Ukraine (Cherkasy, station Zolotonosha[1])	Mykolaiv	240	54			4.43	4.65	4.54
6	Central Ukraine (Cherkasy, station Zolotonosha[1])	Odesa	341				4.15	4.35	4.25

[1]Although each origin region comprises several cities, the major station at the center of each region is considered as a reference to establish the freight price. Western Ukraine producing region = Chernivtsi, Ivano-Frankivsk, Khmelnitskii, Lviv, Rivne, Ternopil, Vinnytsia, Volyn, Zakarpattia, and Zhytomyr provinces. Eastern Ukraine producing region = Dnipropetrovsk, Donetsk, Kharkiv, Luhansk, and Zaporizhia provinces. Central Ukraine producing region = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.

[2]Share is measured as a percentage of total production and illustrates the production in the region.

[3]Rail rates include the cost of delivery to the railway station and the cost of grain hopper rent but do not include movement and positioning of rail cars at the elevator and at the port, railway station fees, security service from loading to discharging port, and freight forwarding service, which could exceed the rail tariff rate. Rail rates are estimated by using specialized software "TM-Karta" in accordance with Ukrzaliznytsia (UZ) tariff regulation.

Average monthly exchange rate from the National Bank of Ukraine was used to convert Ukrainian Hryvnia to U.S. dollars.

Note: qtr = quarter. mt = metric ton. Avg = average.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Table 4. Monthly Ukrainian grain export truck transportation cost index

Month	Freight price (US$/mt/100 miles)	Index variation (%) (Base: prior month)	Index value (Base: Jan. 05 = 100)
Jan-19	18.65	0.0	100.00
Feb-19	19.15	2.6	102.65
Mar-19	16.75	-12.5	89.81
Apr-19	14.92	-10.9	79.99
May-19	15.16	1.6	81.30
Jun-19	15.09	-0.5	80.93
Jul-19	15.53	2.9	83.28
Aug-19	15.84	2.0	84.94
Sep-19	16.15	1.9	86.58
Oct-19	16.12	-0.2	86.45
Nov-19	18.47	14.5	99.01
Dec-19	17.80	-3.6	95.42

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Table 5. Quarterly ocean freight rates for shipping grain from selected Ukrainian ports (US$/metric ton)

Cargo	Port	Destination	1st qtr 2019	2nd qtr 2019	3rd qtr 2019	4th qtr 2019
Wheat	Mykolaiv	Alexandria, Egypt[1]			16.33	15.83
Wheat	Mykolaiv	Ciwandan/Cigading, Indonesia[2]			39.92	35.58
Wheat	Odesa	Alexandria, Egypt[1]			14.58	14.08
Wheat	Odesa	Ciwandan/Cigading, Indonesia[2]			38.17	33.83
Corn	Mykolaiv	Alexandria, Egypt[1]			16.33	15.83
Corn	Mykolaiv	Southern ports, China[2]			38.08	36.25
Corn	Odesa	Alexandria, Egypt[1]			14.58	14.08
Corn	Odesa	Southern ports, China[3]			35.33	33.50
Soybeans	Mykolaiv	Southern ports, China[3]			37.08	35.25
Soybeans	Odesa	Southern ports, China[3]			35.33	33.50

[1]Vessel size = 25,000-30,000 metric ton.
[2]Vessel size = 50,000-55,000 metric ton.
[3]Vessel size = 60,000-70,000 metric ton.
Note: China's main southern ports include Shanghai, Ningbo, Shenzhen, and Guangdong.
Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine and USDA, Agricultural Marketing Service.

Ukraine Grain Transportation

Acknowledgments:

The authors would like to thank Andrew Sowell, Yoonhee Macke, William George, Ryan Taylor Williams, Robin Gray, and Denys Sobolev (USDA, Foreign Agricultural Service (FAS)); Michael Jewison (USDA, Office of the Chief Economist (OCE)), and James Hansen (USDA, Economic Research Service) for providing data, regional information, and ocean route maps. They also thank Keith Menzie, William Chambers (USDA, OCE); Patrick Packnett, Andrew Sowell, Yoonhee Macke, and Denys Sobolev (USDA, FAS); Surajudeen Olowolayemo, and Kranti Mulik (USDA, AMS); and William Wilson (North Dakota State University) for comments and critiques. Thanks also to USDA, AMS employees Maria Williams, editor, and Jessica Ladd, graphic designer.

Contact Information:

Delmy L. Salin
Senior Economist, Project Manager
delmy.salin@usda.gov
202.720.0833

Jessica Ladd
Graphic Analyst
jessica.ladd@usda.gov
202.720.6494

Data Sets (XLS files):

- Figure 1. U.S. and Ukrainian grain and oilseeds exports by mode, 2019
- Figure 2. Ukrainian river cargo volume, 2013-19
- Table 1. Quarterly costs of transporting Ukrainian wheat from the Black Sea ports to Egypt and Indonesia
- Table 2. Quarterly costs of transporting Ukrainian corn from the Black Sea ports to Egypt and China
- Table 3. Quaterly rail rates for selected Ukrainian grain export transportation routes, 2019
- Table 4. Monthly Ukrainian grain and oilseeds export truck transportation cost index
- Table 5. Quarterly ocean freight rates for shipping grain from selected Ukrainian ports (US$/metric ton)

Preferred Citation:

Delmy Salin. March 2020. *Ukraine Grain Transportation*, U.S. Department of Agriculture, Agricultural Marketing Service. Web <http://dx.doi.org/10.9752/TS260.02-2020>

Photo Credit: USDA