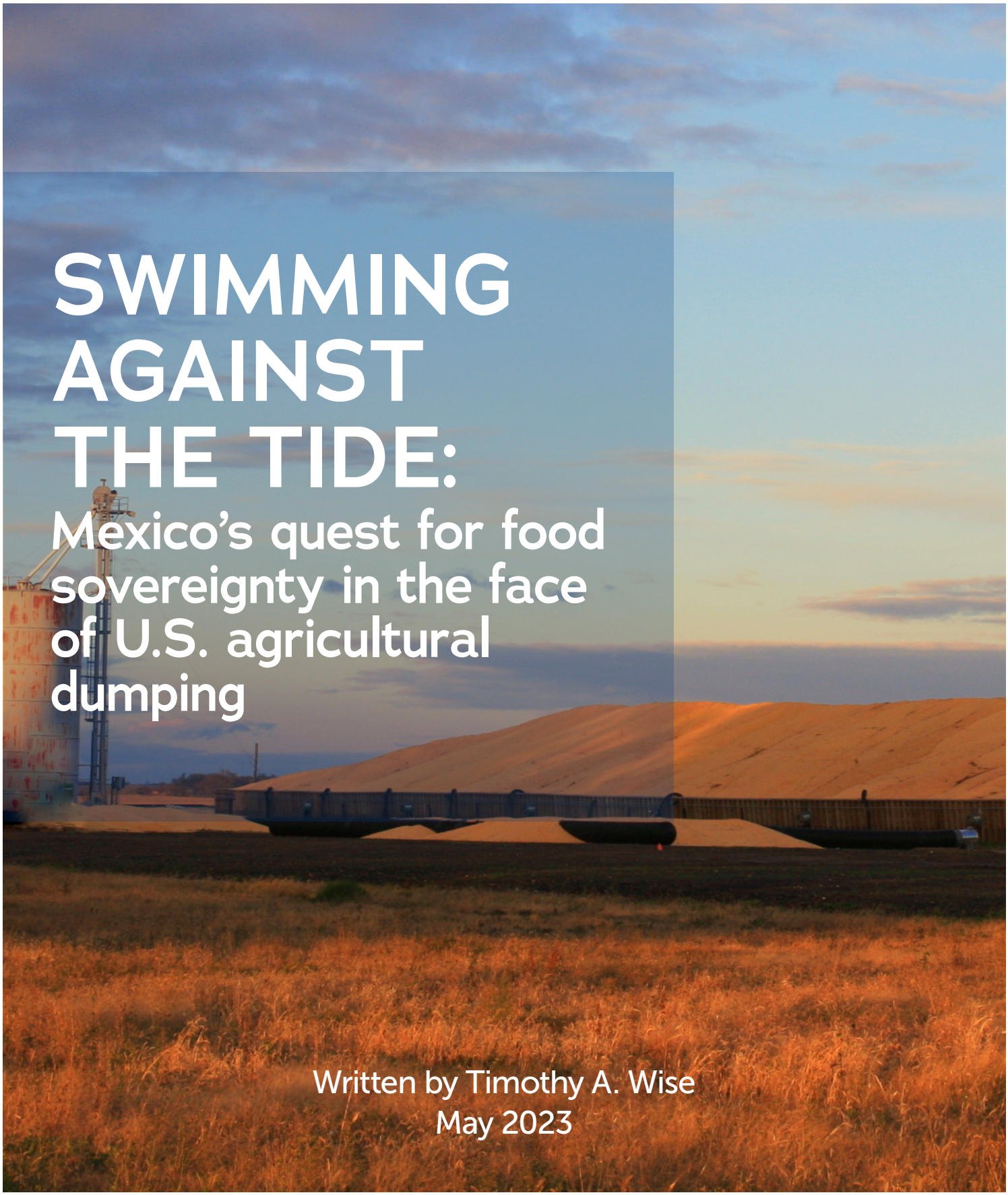

SWIMMING AGAINST THE TIDE:

Mexico's quest for food sovereignty in the face of U.S. agricultural dumping

Written by Timothy A. Wise

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Institute for Agriculture & Trade Policy

Swimming Against the Tide: Mexico's quest for food sovereignty in the face of U.S. agricultural dumping

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SWIMMING AGAINST THE TIDE:
MEXICO'S QUEST FOR FOOD SOVEREIGNTY IN THE FACE OF U.S. AGRICULTURAL DUMPING

EXECUTIVE SUMMARY

Since the beginning of the North American Free Trade Agreement (NAFTA) in 1994, Mexico has experienced a dramatic deterioration in its ability to grow its own food. This has been particularly true for basic grains and meats, foods that flooded Mexico with cheaper exports from the United States after NAFTA eliminated most of the trade restrictions Mexico had used to protect its farmers from foreign competition. Many of those U.S. exports were especially cheap because the U.S., during much of the post-NAFTA period, exported products at prices below what it cost to produce them, one definition of the unfair trade practice known as dumping.

As the Institute for Agriculture and Trade Policy (IATP) has documented, in 16 of the 28 years since NAFTA took effect, the U.S. exported corn, soybeans, wheat, rice and cotton at prices 5-40% below what it cost to produce them. IATP refers to these percentages as dumping margins. With post-NAFTA export volumes of key food crops surging, Mexican producers of these crops saw prices fall precipitously. The foreign competition and low prices dampened Mexico's domestic production, prompting a steady rise in the country's dependence on imported foods.

Given their relative importance in Mexican agriculture and diets, corn and wheat are of particular concern. Prior to NAFTA, Mexico was nearly self-sufficient in corn, importing just 7% of its needs. That rose to 30% in 2006-8 under the deluge of cheap imports, and it now stands at 38%. Wheat production has fared even worse, with import dependency rising from 18% before NAFTA to 66% now. Mexico now imports 48% of its grain and oilseed consumption, with just 52% produced in Mexico.

The purpose of this report is to assess how U.S. agricultural dumping of cheap exports has contributed to Mexico's loss of food self-sufficiency. We focus on the most recent period of agricultural dumping, from 2014 to 2020, when key U.S. crops were exported at below what it cost to produce them, building on a 2009 Tufts University study of the first post-NAFTA wave of dumping, from 1997 to 2005.

The government of Andrés Manuel López Obrador came into office in 2018 vowing to address Mexico's rising import dependence. "We are going to produce in Mexico what we consume," promised López Obrador during his campaign. His government has prioritized five key foods — corn, wheat, beans, rice and dairy — with a series of government programs designed to restore some measure of self-sufficiency. Here, we focus on the impact U.S. agricultural dumping has on those staple foods.

We find that:

- After the 1997-2005 period of U.S. dumping, when dumping margins were between 10% and 40%, prices rose with the food-price crisis spurred by the U.S. corn ethanol boom, the 2007-8 financial crisis and a severe drought in 2011. But by 2014 export prices returned to dumping levels, with dumping margins averaging between 6% and 27% through 2020 depending on the crop. Market disruptions from the COVID-19 pandemic and the Russia-Ukraine war raised crop prices in 2021.

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- U.S. exports to Mexico have continued to increase in the last 12 years, not at the exponential rates immediately following NAFTA but generally faster than Mexican production has risen. As a result, Mexico's import dependency for the five priority foods has continued to rise to between 14% and 80%. It has also risen for key meat products.
- U.S. dumping cost Mexican corn and wheat producers nearly $6 billion in lost value for their crops. With U.S. exports of corn and wheat entering Mexico at dumping margins of 10% and 27% respectively from 2014 to 2020, domestic producer prices were lowered by comparable percentages. Collectively, Mexican corn farmers lost $3.8 billion in value for their crop while wheat farmers lost $2.1 billion.
- While the López Obrador administration's efforts to stimulate domestic production have the potential to reduce import dependency, there is limited evidence through 2022 that they have resulted in significant increases in production. In part, this is due to U.S. dumping in the first two years of the administration, as cheap imports and low prices reduced the incentives for Mexican farmers to increase their output.
- International prices are now relatively high, thanks to pandemic disruptions and the Russia-Ukraine war. This may stimulate increases in domestic production, but previous rises in import dependency leave Mexican importers with very high bills. Corn imports alone cost Mexico nearly $5 billion last year. Since 2000, Mexico's costs of importing corn, wheat, beans and rice jumped sevenfold in nominal terms, from $979 million to $7.2 billion.

International crop prices are projected to return to low levels in coming years. U.S. agricultural dumping is not a thing of the past: It is a feature of U.S. industrialized agriculture prone to overproduction and below-cost prices to farmers. This is not just bad for Mexican farmers forced into competition with more industrialized U.S. farms. It is bad for U.S. farmers and rural communities, as low prices undermine local economies and leave farmers dependent on an expensive but inefficient set of government subsidies.

In trying to reverse decades of rural neglect and U.S. dumping, the Mexican government is swimming against some very strong tides, currents made only more treacherous by a trade agreement that severely limits what strokes Mexico can employ. Reducing import dependence and increasing domestic production of priority food crops are worthy goals, for a variety of reasons: poverty reduction, rural development, increased resilience to price and supply shocks, greater control over the quality of the food Mexicans consume and even national security.

Trade practices such as agricultural dumping are unfair and are proscribed by a range of international trade agreements. As we show in this report, U.S. dumping undermines Mexico's legitimate efforts to stimulate domestic production of priority food crops and reduce its dependence on imports.

SWIMMING AGAINST THE TIDE: MEXICO'S QUEST FOR FOOD SOVEREIGNTY IN THE FACE OF U.S. AGRICULTURAL DUMPING

Three decades of unfair trade

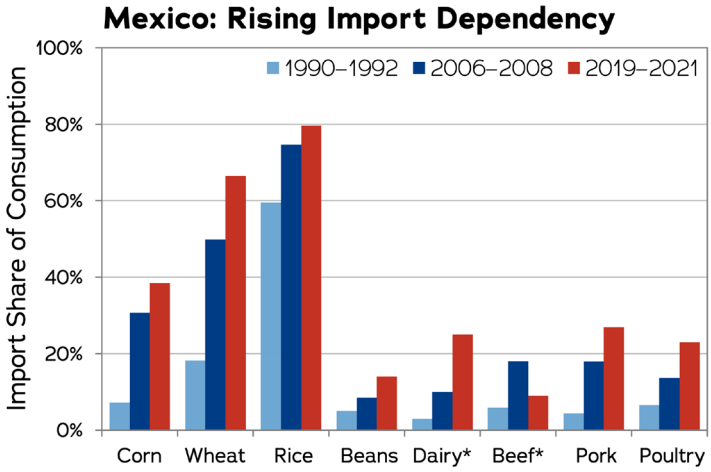
Since the beginning of the North American Free Trade Agreement (NAFTA) in 1994, Mexico has experienced a dramatic deterioration in its ability to grow its own food. This has been particularly true for basic grains and meats, foods that flooded Mexico with cheaper U.S. exports after NAFTA eliminated most of the trade restrictions Mexico had used to protect its farmers from foreign competition. Many of those U.S. exports were especially cheap because the U.S., during much of the post-NAFTA period, exported products at prices below what it cost to produce them, one definition of the unfair trade practice known as dumping.

The impacts were especially dramatic for two of the country's key staple crops, corn and wheat. Corn is the iconic staple of the Mexican diet, economy and culture, with some three million farmers cultivating a wide range of native and hybrid varieties for tortillas, tamales and a sumptuous array of other foods. U.S. corn exports to Mexico increased more than 400% between the early 1990s and 2006, while low U.S. export prices helped drive down the prices Mexican producers received for their corn by 66% by 2005, adjusting for inflation. While not as central to Mexican culture and cuisine, wheat had become a core staple grain, thanks in part to the Green Revolution research done on the crop in Mexico.[1] Under NAFTA, U.S. wheat exports ballooned nearly 600% by 2006, with low export prices driving producer prices down 60%. Rice, another important grain, saw U.S. exports jump more than 500%, forcing down Mexican producer prices by 55%.[2]

While NAFTA generated a boom in Mexican exports to the U.S. of off-season crops such as tomatoes, strawberries and avocados, the country has seen the continued weakening of its capacity to grow a significant share of its own staple foods. As Figure 1 shows, Mexico's dependence on imports has grown steadily since NAFTA for key food crops and products.

For each crop, the three bars present the share of Mexican consumption accounted for by imports. The light blue bar offers a pre-NAFTA baseline for the average import-dependence for the three-year period

Figure 1.



* Calculation ignores non-U.S. imports and Mexican exports
Source: USDA-FAS, PSD Online & GATS, 2023; SAT/SIAT, 2022; FAOSTAT, 2023

1990-2. The dark blue bar is for 2006-8, after NAFTA liberalization and a nine-year period of U.S. dumping, with the red bar presenting the most recent data available for 2019-21. In nearly every case, there has been a steady and significant rise in import-dependence. Given their relative importance in Mexican agriculture and diets, corn and wheat are of particular concern. Prior to NAFTA, Mexico was nearly self-sufficient in corn, importing just 7% of its needs. That rose to 30% in 2006-8 under the deluge of cheap imports, and it now stands at 38%. Wheat production has fared even worse, with import dependence rising from 18% before NAFTA to 66% now. Mexico now imports 48% of its grain and oilseed consumption, with just 52% produced in Mexico.[3]

The Mexican government is now seeking to reverse these trends. The government of Andrés Manuel López Obrador came into office in 2018 with a sweeping mandate to reverse decades of pro-free-trade policies and rural neglect.

"We are going to produce in Mexico what we consume," promised López Obrador during his campaign. "We are in a tremendous crisis because we depend on foreigners for what we consume. There is no food sovereignty."

Through a coordinated set of policies, the government has set out to increase food self-sufficiency in five priority foods: corn, wheat, rice, beans and dairy. All the measures are consistent with existing trade agreements, which limit the use of protective tariffs, the most common measure used historically to increase domestic production while shielding domestic producers from international competition. Those programs include:

- **Producción para el Bienestar**, roughly translated as "Production for Well-Being" — The López Obrador government has shifted its agricultural subsidy programs to favor small and medium-scale farmers, increasing access to technical assistance and inputs, including fertilizers. The government is using some of the programs to promote a transition to agroecological practices.
- **Sembrando Vida** (Sowing Life) — An agroforestry initiative subsidizing the widespread planting of trees on small-scale farms to improve soil fertility, slow erosion, increase soil carbon sequestration and increase staple-crop production.
- **Precios de Garantía** (Support Prices) — Has the goal of providing small and medium-scale producers of priority food crops with remunerative prices to incentivize local production, with public procurement providing healthier local foods to schools, hospitals and other public institutions.

The purpose of this report is to assess how U.S. agricultural dumping of cheap exports has contributed to Mexico's loss of food self-sufficiency. We focus on the most recent period of agricultural dumping, from 2014 to 2020, when key U.S. crops were exported at below what it cost to produce them. This updates a 2009 Tufts University study of the first post-NAFTA wave of dumping, from 1997-2005.[4] Though international prices are now high, thanks to pandemic disruptions and the Russia-Ukraine war, they are likely to return to low levels.[5] Further agricultural dumping could again undermine Mexico's efforts to stimulate domestic production of its priority food crops.

Import dependence and U.S. dumping

Mexico's rising levels of import dependence are closely related to the flood of cheap imports from the U.S. since NAFTA. Cheap imported crops and animal products can displace domestically produced goods. Even when they don't, they put downward pressure on local prices, making it harder for domestic producers to earn a living from their farms while reducing incentives to produce.

That is aggravated by agricultural dumping, when crops and products are exported at below what it cost to produce them. High farm subsidies have been blamed for U.S. agricultural dumping, but the causes are more complex. Industrialized agriculture, if left

Table 1.

U.S. Dumping on Mexican Producers 1997–2005

	United States		Mexico		
	Exports to Mexico 1990-2 - 2006-8 % change	Dumping Margin 1997-2005 average	Real Producer Prices (pesos) 1990-2 - 2005 % change	Production volume 1990-2 - 2006-8 % change	Dumping Losses 1997-2005 millions USD
Corn	413%	19%	-66%	50%	6571
Soybeans	159%	12%	-67%	-83%	31
Wheat	599%	34%	-58%	-7%	2176
Cotton	531%	38%	-65%	-3%	805
Rice	524%	16%	-51%	-8%	67
Beef	278%	5%	-45%	31%	1566
Pork	707%	10%	-56%	40%	1161
Poultry	363%	10%	-44%	133%	455
Total					12832

Source: USDA-FATUS; IATP; Starmer et al. (2006); SAGARPA; losses in constant 2020 USD.

unregulated, has a natural tendency toward overproduction. Chronic overproduction, in turn, pushes down prices as supply outstrips demand. Subsidies make up some losses for some farmers, but prices remain low. When export prices fall below the costs of production (allowing for transport and handling costs), that is considered an unfair trade practice known as dumping. (See Appendix 2 for more on U.S. agricultural dumping.)

IATP has documented U.S. dumping of key agricultural commodities since 1998.[6] After the 1996 Farm Bill dismantled the last vestiges of U.S. government policies designed to boost prices by limiting overproduction, U.S. dumping of key commodity crops became more commonplace. By IATP calculations, from 1997-2005 corn, soybeans, wheat, cotton and rice were exported at prices between 12% and 38% below production costs.[7] IATP refers to these as "dumping margins." After a brief period of higher prices following the 2007-8 food crisis, U.S. dumping resumed in 2014. Between 2014 and 2020, dumping margins for those same crops were between 5% and 28%. Only the disruptions of the pandemic and the Russia-Ukraine war pushed prices above production costs since 2021. (See text box on our methodology.)

That first period of agricultural dumping cost Mexico dearly. As Wise documented in his 2009 study, the post-NAFTA surge in exports made Mexico particularly vulnerable as U.S. export prices depressed domestic prices.[8] The result was rising import dependence and weakened domestic production in most crops. As Table 1 shows, domestic production declined for four

A NOTE ON DATA AND METHODOLOGY

The methodologies and data sources used in this report are presented in detail in Appendix 1. Data are primarily from U.S. and Mexican government sources, as detailed in the appendix. To provide some clarity, we note the most important elements of the methodology and terminology here:

Time periods — For the growth in **U.S. exports** and trends in **Mexican production**, we use three-year averages to smooth annual variations, reporting two periods:

Pre-NAFTA baseline of 1990-2, prior to NAFTA's implementation in 1994, through 2006-8, after the 1997-2005 period of U.S. dumping had its impacts.

From 2006-8 through 2018-20, to capture more recent trends through the end of the 2014-20 period of dumping, and prior to the disruptions of the pandemic and the Russia-Ukraine war.

For **Mexican producer price trends**, adjusting for inflation, we estimate the change in prices from before NAFTA, 1990-2, to the end of the first dumping period in 2005. This measures the real price impacts on Mexican producers from the post-NAFTA surge in exports, often at dumping prices. We then use three-year averages to estimate producer-price trends from 2003-5 to 2018-20, the end of the most recent period of dumping. The goal is to assess whether producer prices recovered or if they continued to fall from previous low levels.

Dumping margins are presented as averages for the two periods, 1997-2005 and 2014-2020, for the crops on which IATP got data. Those are both periods, interrupted by the 2007-8 food price spikes and the 2011 drought, when export prices were below the full costs of production, defined as average farmer costs of production plus transportation, marketing and government-funded input subsidies. The dumping margin is the percentage by which export prices are below full production costs, one method recognized in international trade. (See Appendix 2 for more on agricultural dumping.)

Farmer losses to U.S. dumping — We assume that producer prices in Mexico are reduced by the percentage of the dumping margin for the years in which dumping took place, a reasonable assumption since the Organisation for Economic Cooperation and Development (OECD) considers U.S. prices for these crops to be the "reference prices" in Mexico.[31] We apply that to the volume of Mexican production for each crop in those years to estimate the lost value from dumping-related price suppression, e.g., that Mexican corn farmers' crop would have been worth $3.8 billion more between 2014 and 2020 if U.S. corn exports had not been 10% below the costs of production.

Please see Appendix 1 for more detail and links to data sources.

of those five dumped crops, with only corn production showing surprising resilience.

The table shows: the rise in U.S. exports from before NAFTA to 2006-8 (using three-year averages to account for annual variations); the average dumping margins for the nine-year period; the drop in real producer prices from before NAFTA to 2005; the impact on domestic production from before NAFTA to 2006-8; and the "dumping losses" incurred by Mexican farmers. This is the lost value of Mexican farmers' crops attributable to, for example, the 19% dumping margin for corn, which depressed domestic prices by a commensurate amount. Over nine years, corn farmers are estimated to have lost $6.6 billion to dumping. Wheat farmers also suffered large losses of more than $2 billion.

That earlier study included meats because they showed dramatic increases in U.S. exports, more than 700% for pork. IATP has not calculated dumping margins for animal products due to the technical difficulties of assembling reliable data. Wise's 2009 study estimated one portion of dumping: the extent to which beef, pork and poultry prices were lowered by their access to below-cost corn and soybeans, the key ingredients in feed which account for the largest operating costs for factory farms. He estimated dumping margins just from below-cost feed at 5-10% for pork, poultry and beef. As with the commodity crops, U.S. exports pushed down producer prices in Mexico and producers there saw $3 billion in lost value due to below-cost feed used to produce those meat imports.

U.S. agricultural dumping on Mexico 2014-20

In this report, we assess how the more recent seven-year period of dumping impacted Mexican food production and farmers. The goal is to document not simply the impacts of dumping but the key import, price and production trends for the five food products the Mexican government has prioritized in its effort to improve self-sufficiency: corn, wheat, rice, beans and dairy.

Table 2 shows the main trends since 1990 for those priority food crops, as well as meats.

The table shows:

- The growth in U.S. exports in two periods, from 1990-2 to 2006-8 and 2006-8 to 2018-20. The first period saw an explosion in exports following NAFTA. The second saw continued export growth for most products but at a slower pace.
- The impacts on real producer prices in Mexico for two periods: from before NAFTA to 2005, the end of the first period of dumping; and from 2003-5 to 2018-20, which includes the second dumping period 2014-20, to assess whether producer prices continued their decline or recovered. After producer prices plummeted 48%-68% in real terms

Table 2.

Exports, Producer Prices, and Production Volume 1990-2020

	United States		Mexico			
	Export Growth		Real Producer Prices		Production volume	
	1990-2 - 2006-8	2006-8 - 2018-20	1990-2 - 2005	2003-5 - 2018-20	1990-2 - 2006-8	2006-8 - 2018-20
Corn	413%	48%	-68%	19%	52%	17%
Wheat	599%	26%	-60%	34%	-5%	-16%
Rice	524%	-8%	-55%	27%	-25%	-4%
Beans	38%	-6%	-54%	16%	4%	-10%
Dairy	467%	239%	-52%	-10%	56%	18%
Beef	281%	-35%	-49%	26%	38%	24%
Pork	701%	179%	-48%	-8%	43%	39%
Poultry	335%	106%	-54%	-4%	203%	37%

Source: USDA-FATUS; IATP; Starmer et al. (2006); SAGARPA.

Table 3.

U.S. Dumping on Mexican Producers 2014–2020

	United States		Mexico		
	Exports to Mexico 2006-8 - 2018-20 % change	Dumping Margin 2014-20 average	Real Producer Prices (pesos) 2003-5 - 2018-20 % change	Production volume 2006-8 - 2018-20 % change	Dumping Losses 2014-20 millions USD
Corn	48%	10%	19%	17%	3775
Wheat	26%	27%	34%	-16%	2111
Rice	-8%	5%	27%	-4%	21
Beans	-6%		16%	-10%	
Dairy	239%		-10%	18%	
Beef	-35%		26%	24%	
Pork	179%		-8%	39%	
Poultry	106%		-4%	37%	

Source: USDA-FATUS; IATP; Starmer et al. (2006); SAGARPA; losses in constant 2020 USD.

immediately following NAFTA, farm prices in Mexico subsequently recovered a small share of that lost value for most food products.

- The impacts of each of the two export periods on Mexican production. For wheat and rice, production dropped due to low prices and import competition in the period immediately following NAFTA. Corn was the notable exception with production expanding 52%. Meat production continued to grow despite lower prices. In the second dumping period, crop production grew but relatively slowly, with the exception beans and wheat, which saw continued production declines.

Between 2014 and 2020, the U.S. was exporting key staples at prices below what it cost to produce them. IATP does not calculate dumping margins for beans, dairy or animal products, so we only report "losses to dumping" for corn, wheat and rice.

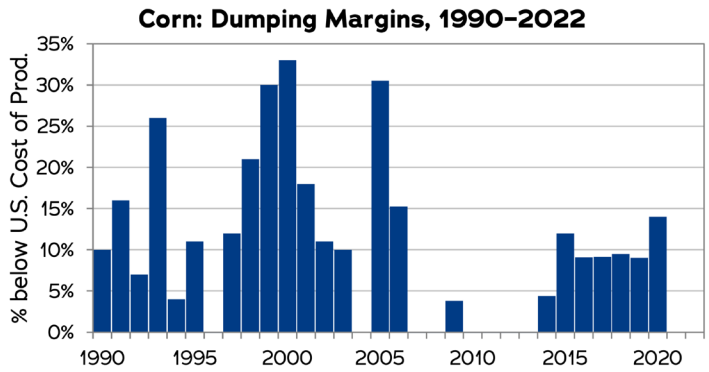
Table 3 shows how dumping slowed domestic production and cost Mexican producers. Overall, the data show that U.S. exports have continued to rise for most crops and products since 2006-8, though not as much as immediately after NAFTA. Dairy, pork and poultry exports continued to grow significantly. Dumping margins are slightly lower, but significant. Producer prices for most products recovered somewhat from their 2005 lows, though real prices still fell for dairy, pork and poultry. Domestic production rose for most products, but not dramatically, and it fell for wheat and beans. Dumping losses were significant for corn and wheat, totaling nearly $6 billion over the seven-year period.

A brief analysis of each of the priority crops follows, drawing primarily on U.S. and Mexican government data.

Corn: U.S. dumping impedes self-sufficiency

Corn is far and away Mexico's most important food crop, and corn for animal feed is the country's most expensive agricultural import. So, it is the top priority in government efforts to increase domestic production and reduce dependence on imports. The data illustrate how dumped U.S. corn exports have contributed to those problems. As Figure 2 shows, the U.S. has been exporting corn at below production costs since 1990, except during the seven-year period from 2007-13 and in the last two years 2021-2. (For years in which export prices are above production costs, the dumping margin is zero in the graph.) During the recent wave of dumping from 2014-20, dumping margins averaged 10%. Despite downward price pressure due to rising U.S. exports at dumping-level prices,

Figure 2.



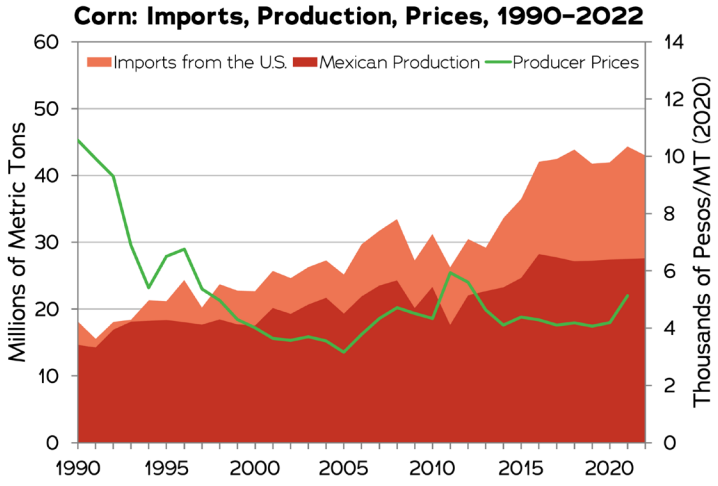
Source: OECD, 2023; IATP, 2023

Mexico has remained largely self-sufficient in white and native corn used for direct human consumption. Its import dependence is overwhelming in yellow corn for animal feed and industrial uses. Nearly all the imported corn is genetically modified, which has been a source of controversy in Mexico.[9]

The long-term trends are evident in Figure 3, which shows:

- A slow rise in domestic production, represented by the red area in the graph (measured on the left axis). This has left Mexico largely self-sufficient in white corn and native corn, the key ingredients in tortillas and many other corn-based foods.
- A faster rise in imports from the U.S. (in orange, on top of Mexican production), which have grown to represent 38% of total corn consumption. Most U.S. exports are yellow corn used as feed and in processed foods. Mexico's import-dependence in corn is largely driven by the rising demand for yellow feed corn.

Figure 3.



Source: USDA-FAS, PSD Online & GATS, 2023; SAGARPA, SIAP, 2023

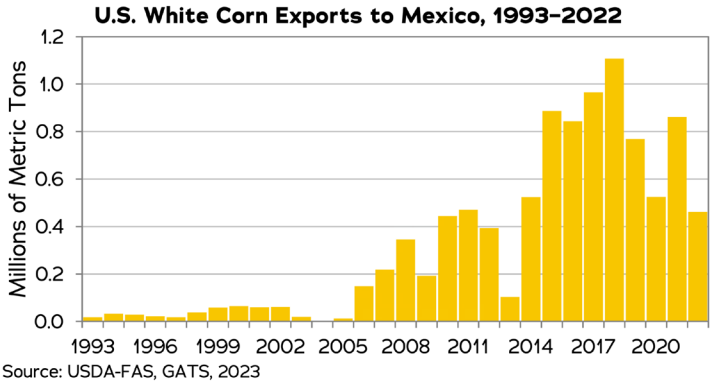
- Producer prices, adjusted for inflation (the green line measure on the right axis), fell dramatically through 2005 under downward pressure from imports, and after a brief rise following the 2007-8 food crisis, they again fell, partly due to pressure from U.S. dumping.
- We estimate the losses to Mexican corn producers from lower prices depressed by U.S. dumping to be $3.8 billion between 2014 and 2020.

Mexico's corn production illustrates the ways in which prices can influence production. Rising prices in 2007-8 provided incentives that increased domestic corn production nearly 20% from 2005-8. The growth in imports slowed as domestic production increased. The generalized, if erratic, upward production trend stopped in 2016 when international prices and U.S. dumping eliminated those incentives to produce. Low or falling prices are directly related to the surges in corn imports from 1997 to 2006 and again from 2014 to 2018.

Remarkably, the precipitous drop in producer prices following the NAFTA-fueled surge in imports did not produce the decline in production seen for other crops. This may well have been because U.S. yellow corn exports were not a ready substitute for the white and native corn varieties used in most Mexican food preparations. Demand for white and native corn continued to grow, which seems to have sustained Mexican corn production despite punishingly low prices paid to farmers.[10]

U.S. white corn exports have been rising since 2005, though they still represent only about 4% of U.S. exports to Mexico (see Figure 4). It is unclear what portion of this is genetically modified (GM) corn — the U.S. government does not track such data — nor what portion, if any, is imported for use in tortillas and other

Figure 4.



Source: USDA-FAS, GATS, 2023

foods made from minimally processed corn. Mexico's revised February 2023 restrictions on GM corn apply not to imports but to use in this segment of the market largely supplied by Mexican production.[11]

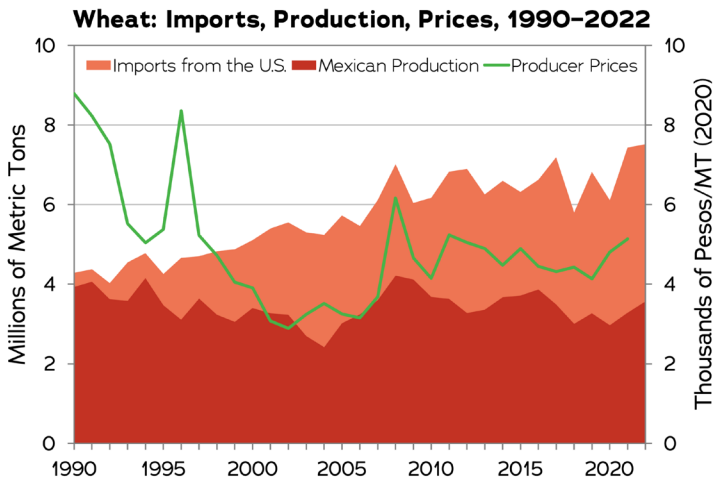
While the decline in white corn imports in 2022 suggests some progress in reducing import-dependence, national-level data through 2022 show few signs that the government's new policies have stimulated a significant increase in corn production. A 2012 study showed that Mexico has the potential to restore much of its self-sufficiency with the right mix of government policies.[12] According to a recent presentation by Victor Suárez, Mexico's Undersecretary of Agriculture for Food Self-Sufficiency, the government is serious about replacing yellow corn imports by increasing domestic production and developing non-corn sources of animal feed.[13] The government is carrying out a detailed evaluation of the impacts of its programs, and results are expected later this year.

Wheat: Mexico loses productive capacity

Wheat is a far less important staple than corn in Mexico, but it is probably the basic grain most dramatically impacted by agricultural dumping following NAFTA. Recall from the tables earlier that in the first 12 years following NAFTA, Mexico saw a 600% increase in U.S. exports with average dumping margins (1997-2005) of 36%. That drove down producer prices 60% in real terms, which in turn resulted in a 5% decline in domestic production. That situation has not improved, according to more recent data. Since 2008, imports had grown an additional 26% by 2020. Prices recovered almost half their lost value, rising 34%, but dumping margins of 27% from 2014 to 2020 contributed to a further decline in domestic production of 16%. Unlike corn, with distinct white and yellow varieties, wheat imports are direct substitutes for domestic varieties. In most recent years, Mexico has imported more wheat than it has grown — the orange section in the graph rising faster than the red, with consumption of wheat-based products increasing with changing diets. We estimate that U.S. dumping cost Mexican wheat producers $2.1 billion in lost value from lower prices from 2014 to 2020 (Figure 5).

Production data for 2021 and 2022 show increases, a hopeful sign that government programs to support wheat production are beginning to show results.

Figure 5.

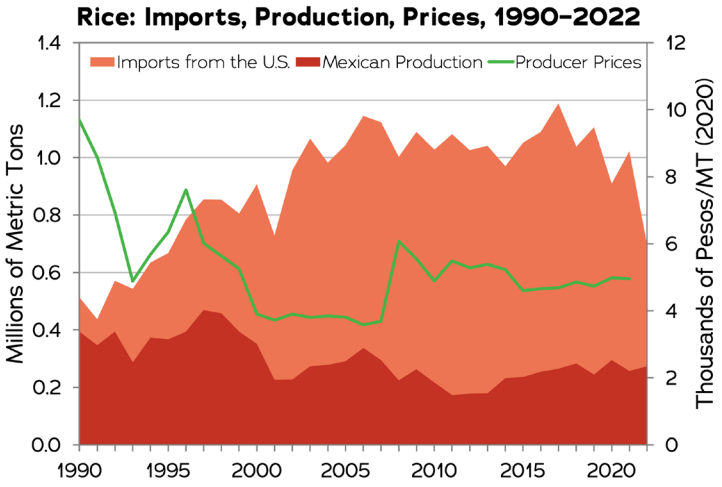


Source: USDA-FAS, PSD Online & GATS, 2023; SAGARPA, SIAP, 2023

Rice: Import-dependency difficult to reverse

Rice is not as central a staple grain, though its consumption has been increasing in Mexico. Even before NAFTA, the majority of rice came from imports. That share has since jumped from 60% to 80% (Figure 6). It is easy to see why. U.S. rice exports surged more than 500% after NAFTA, with prices 16% below production costs. Mexican rice farmers saw prices fall 55% leading to a drop in domestic production of 25%. Since 2008, exports slowed and prices recovered some of their lost value, rising 27%. Dumping margins from 2014-20 averaged 5%, and Mexico registered a 4% drop in domestic production. Of Mexico's priority crops for reducing import dependency, rice is the one that will likely be the most difficult to recover.

Figure 6.

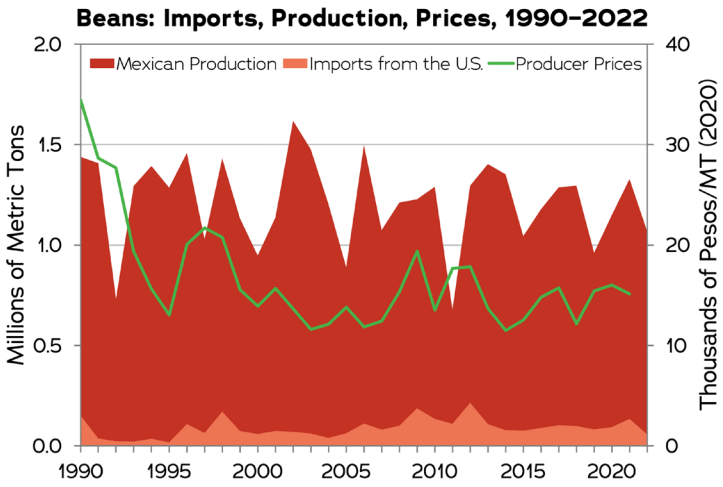


Source: USDA-FAS, PSD Online & GATS, 2023; SAGARPA, SIAP, 2023

Beans: Struggling to meet domestic demand

Dry beans are a crucial staple in the Mexican diet, traditionally accompanying corn both on plates and in the fields. With squash, beans represented one of the two other components of Mesoamerica's remarkable "three sisters," intercropped with corn to both sustain soil fertility and provide most components of a nutritious diet. Dry beans have not been included in most commodity support programs in U.S. farm bills, and the U.S. has not been a major exporter. Mexico has remained largely self-sufficient in bean production. That said, the Mexican government is concerned about rising import levels (the orange section at the bottom of the Figure 7 graph), which now regularly surpass 10% of domestic consumption. Production levels have remained stagnant in Mexico, something the Mexican government hopes to address with its support programs.

Figure 7.



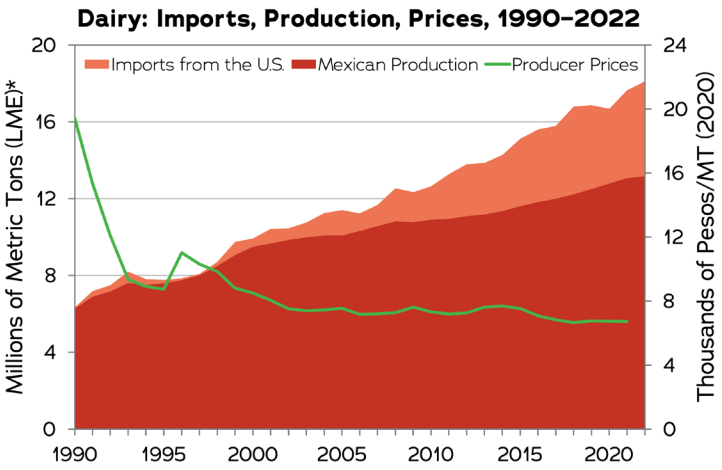
Source: USDA-FAS, PSD Online & GATS, 2023; SAGARPA, SIAP, 2023

Production increases in two of the last three years may be an encouraging sign that government programs are stimulating higher levels of bean production.

Dairy: Big U.S. farms flood the market

Dairy consumption has been rising steadily in Mexico, and the country's production capacity has not been able to keep up. Imports now represent 28% of domestic consumption. NAFTA shifted the source of Mexico's dairy imports, which were significant prior to NAFTA, from New Zealand and Europe to the U.S. Now more than 90% of Mexican dairy imports come from the U.S. Here we focus on import dependency on the U.S., which has grown from 4% to 26%. U.S. dairy

Figure 8.



* Liquid milk equivalent
Source: USDA-FAS, 2023; SAGARPA, SIAP, 2023

exports to Mexico grew more than 450% in the 12 years following NAFTA and another 239% since 2008.[14] Mexican producer prices plummeted by half with the flood of cheap U.S. dairy, and that trend continued with another 10% drop since 2005. This has made it very challenging for Mexican producers to compete, and it has made the new administration's efforts to boost domestic production difficult.

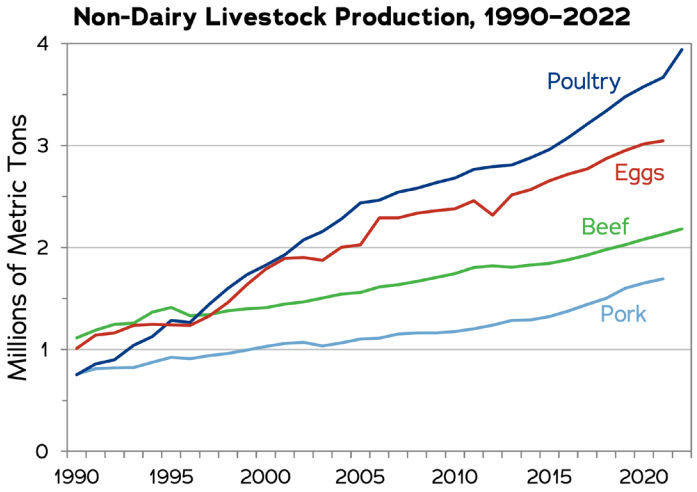
Mexico is largely self-sufficient in liquid milk, which is perishable and not easily shipped long distances. Mexican production has roughly doubled in the last 30 years, despite low prices, with rising consumption sustaining demand for liquid milk. Imports come mainly in the form of non-fat dry milk, which is used in a growing variety of processed foods, such as pizza. The U.S. also exports cheese and small amounts of butter to Mexico. Non-fat dry milk is inexpensive, in part due to overproduction in the U.S. and the availability of inexpensive feed, made from corn and soybeans, which factory farms rely on for large-scale dairy production. With such low prices, Mexican farmers face many of the same economic pressures as Wisconsin family dairy farmers, who have struggled to survive in recent years with prices driven down by factory farm overproduction.[15]

Meat and eggs

As with dairy, consumption of other animal products has been rising as Mexican diets become more diverse with rising incomes for some. Dairy and eggs have become two of the most important sources of animal protein in the Mexican diet, followed by poultry, pork and beef. NAFTA's integration has led to a great deal

of cross-border investment and production, making it difficult to fully account for U.S. or Mexican levels of production, exports and imports. That said, the trends are toward rising levels of Mexican production to meet rising consumer demand, with imports rising even faster. Because much of the growth in production is from factory farms, meat production is the largest driver of demand for yellow corn, which in turn feeds import dependency in that key product.

Figure 9.



Source: SAGARPA, SIAP, 2023; FAOSTAT, 2023

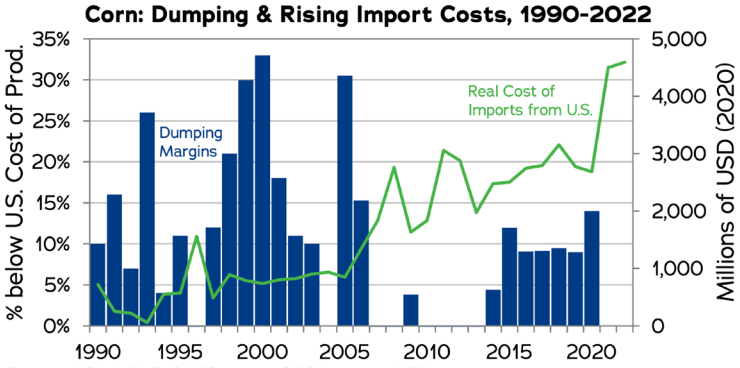
- U.S. pork exports increased more than 700% in the 12 years after NAFTA, and they jumped another 180% since then. Producer prices in Mexico fell more than 60% over that time frame. Still, Mexico-based production nearly doubled, some of that production coming from U.S. firms taking over slaughterhouses. U.S.-based Smithfield became Mexico's largest pork producer. It has since been bought by a Chinese firm. Overall, Mexico's import dependency has soared from less than 5% before NAFTA to more than 25% today.
- The story is similar in poultry. Since NAFTA, U.S. exports have increased more than 500% and producer prices have continued to fall to less than half their pre-NAFTA levels. Despite the price pressure, Mexico-based poultry production has grown by nearly 300%. Still, import dependency has grown from 6% to 23% since NAFTA.
- In beef, Mexican production has more recently kept pace with consumption, which has risen more slowly than it has for more inexpensive poultry and pork. In the 12 years after NAFTA took effect, U.S. beef exports jumped nearly 300%, pushing import dependency to over 20%. Producer prices in Mexico fell almost 50%. In the last 12 years, imports of finished beef from the U.S. have been relatively stable. Over the entire post-NAFTA period, Mexico-based production has grown by about 70%, and import dependence has stabilized at about 9%. Because there is so much cross-border trade in the production process, including in live animals, it is difficult to interpret the data.
- Mexicans have the highest per capita egg consumption in the world, with table eggs serving as the population's most important source of protein. A very small share of eggs is imported. Egg production has roughly tripled since NAFTA took effect, leaving Mexico with one key protein source that is produced overwhelmingly by Mexican producers.[16]

The dual curse of import dependency

The Mexican government is right to be concerned about import dependency, particularly when the vast majority of those imports come from a trading partner with a pattern of dumping. Import dependency increases vulnerability to low international prices and dumping. The larger the share of domestic consumption that comes from imports the greater the influence of those imports on domestic prices. Cheap imports drive down prices and undercut domestic producers. As some go out of business or lose market share, import dependency rises still further, as we can see for all five of Mexico's priority food self-sufficiency crops.

As Figure 10 shows, when international prices rise, as they did in 2007-8 and 2011-13, that higher level of imports costs far more. The graph shows corn dumping margins (measured on the left axis) and the real cost of corn imports from the U.S. (in 2020 U.S. dollars on the right axis). As the line on inflation-adjusted import costs shows, costs rise steadily as imports increase in years when dumping is driving down prices. Then when international prices jump, the costs of corn import dependency rise dramatically. Since prices spiked in 2021 with the disruption of the pandemic and the Russia-Ukraine war, Mexico's import bill for corn reached nearly $5 billion per year, double the cost just five years earlier.

Figure 10.



Source: USDA-FAS, GATS, 2023; OECD, 2023; IATP, 2023

According to Mexican government figures, from 2000 to 2021 Mexico's costs of importing corn, wheat, beans and rice jumped sevenfold in nominal terms, from $979 million to $7.2 billion.

The Mexican government's commitment to greater self-sufficiency in corn, beans and other staple crops is part of a broader commitment to improve public health and the environment. With the greater integration of North American markets, Mexico has seen a rapid rise in diet-related illnesses associate with what has been dubbed "the neoliberal diet," based on rising consumption of processed and ultra-processed foods.[17,18] The U.S. is seen to be "exporting obesity" and other non-communicable health issues. Mexico surpassed the U.S. recently in childhood obesity rates.[19]

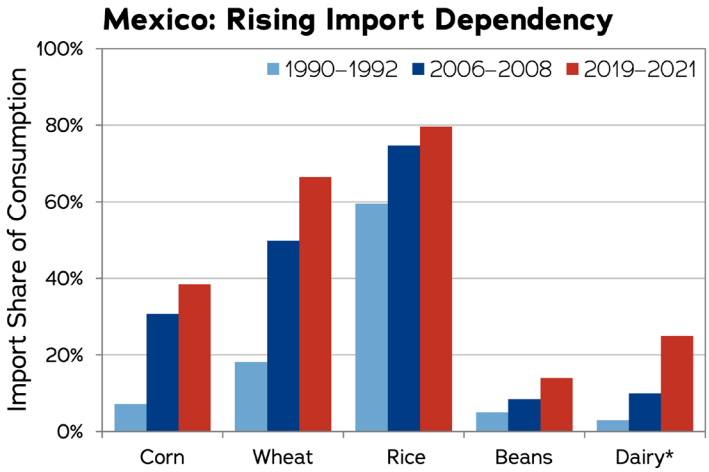
Unlike the U.S., Mexico retains many of its Indigenous food traditions, which feature the remarkable "three sisters" cultivation of corn, beans and squash, Mexico's treasured *milpa*. That Mesoamerican creation sustained soils without depleting nutrients while sustaining growing human populations with a remarkably balanced diet. Many small-scale farmers, many of them from Indigenous groups, continue *milpa* farming in various forms despite intense pressure to grow monocultures using commercial seeds and Green Revolution technologies.

One of the goals of the López Obrador administration's campaign for greater food self-sufficiency is to stop importing obesity and to restore some of that eroded environmental sustainability and dietary health. The government has already instituted a labeling regimen for foods high in salt, fat and sugars, and a proposed health law seeks to ban the use of highly toxic pesticides.[20] Government decrees have also banned the cultivation of genetically modified corn to protect native corn from genetic contamination, phased out glyphosate-based herbicides, and banned the use of genetically modified corn in tortillas and other corn-based foods.[21]

Mexico's new programs to reduce import dependency

With its food self-sufficiency initiatives, the López Obrador government has made a firm commitment to addressing the country's rising import dependence, focusing on five key staple foods: corn, wheat, beans, rice and dairy. As Figure 11 shows, Mexico has seen continued erosion of its levels of self-provisioning in each of those foods. The new programs, introduced soon after the new administration took office in late 2018, seek to reinvest in the productive capacity of farmers with an emphasis on small and medium-scale producers, particularly formerly marginalized Indigenous farmers, and with an eye not only to productivity but also to poverty reduction, improved nutrition and environmental sustainability.

Figure 11.



* Calculation ignores non-U.S. imports and Mexican exports
Source: USDA-FAS, PSD Online & GATS, 2023; SAT/SIAT, 2022; FAOSTAT, 2023

To date, national-level data have yet to reflect significant progress in increasing domestic production. This should not be surprising for several reasons:

- The first two years of the administration saw dumping-level prices on U.S. exports to Mexico. It is very difficult to stimulate domestic production when farm prices are depressed by unfair trade. Higher farm prices since 2021 have been more favorable to such initiatives.

- The pandemic disrupted lives and markets one year after the administration took office. It is difficult to assess how that hampered the roll-out of new programs, but it certainly slowed the pace of change.
- In agriculture, the new administration faced the task of reversing 30 years of neglect on the part of neoliberal governments, reinforced by a free trade agreement that devastated rural communities. In many ways, the López Obrador administration has had to rebuild the basic infrastructure for rural Mexico.

Following is a brief report on the main self-sufficiency programs, their reach and, to the extent data is available, their impacts to date on increasing Mexico's food self-sufficiency in those five priority foods.

Production for Wellbeing (Producción para el Bienestar, or PpB) grants direct support to small and medium-scale producers of corn, beans, wheat, rice, other grains, amaranth and chia, as well as coffee, sugar cane, cocoa, cactus and honey. While the payments are not conditioned on productivity, they are based on land under cultivation. The goal is to give producers the liquidity to invest in productive activities, such as purchasing inputs, hiring labor and renting machinery and equipment.[22]

The program represents a significant shift in the government's main farm subsidy program with its exclusive focus on farmers with fewer than 50 acres in rainfed land or 12.5 acres of irrigated land. Previous programs, Procampo and Proagro, supported farms with up to 250 acres with per-acre subsidies of up to $40/acre. The vast majority of support ended up in the hands of large-scale commercial producers. Under PpB, support goes only to small and medium-sized farms with annual payments of $300-1,200 per farm, with the expanded inclusion of smaller-scale growers and those in Indigenous regions. Roughly 2 million farmers are now enrolled in the program, and the budget for 2023 has been increased to allow for further expansion. The program also provides easier access to credit for beneficiaries.

PpB beneficiaries are also eligible for distributions of free fertilizer, an initiative that will expand dramatically in 2023 to reach between 1.5 and 2 million maize, bean, wheat and rice producers. As with many developing countries, the rise in energy and fertilizer prices with the Russia-Ukraine war has hit Mexican producers hard. The current program is drawing on Mexico's controversial reinvestment in the state-run PEMEX oil company. Part of that investment includes the resurrection of Mexico's domestic fertilizer industry, which was largely abandoned under previous governments. By the end of 2024, Mexico hopes to be producing all of the fertilizer it needs for government programs, an aspect of self-sufficiency that should not be overlooked.[23]

While investment in fossil-fuel-based inputs would seem to fly in the face of commitments to agroecology and sustainable agriculture, the government has dramatically expanded the provision of "Technical Accompaniment" to producers with a new focus on sustainable input use as part of a transition to agroecology. This is not a small initiative. In addition to training thousands of agronomists in ecological agriculture, the government now operates more than 4,000 "field schools" with local farmers and technical advisors promoting a transition to agroecological farming.[24]

The early results have been encouraging and bode well for increasing productivity while promoting sustainability. For a sample of producers involved since 2019, there has been a marked decrease in the use of toxic chemicals such as glyphosate and a 20-25% increase in the use of "bio-inputs," including bio-fertilizers, many of which are being produced using local materials. Producers have seen decreases in production costs of up to 45% for corn and bean farmers. Even with the lowered use of inputs, farmers in the field school programs saw 25-35% increases in corn yields in the first two years of the initiative, and even higher yield increases for beans.[25]

The challenge now is to expand the reach of such programs to more farmers, including some of the larger producers not now included in the PpB's efforts. Government officials express confidence that production will increase significantly in 2023 with continued high crop prices, expanded fertilizer access, and increases in the budget and reach of PpB. The additional challenge, of course, is to address concerns raised by farmer organizations and local authorities that such programs could be more effective if they worked more closely with local organizations.[26]

Planting Life (Sembrando Vida) promotes agroforestry among small-scale marginalized producers by subsidizing and supporting the planting of trees for timber and cash crops as a means of increasing soil

fertility, carbon sequestration and food crop productivity. Building on years of pilot programs, it offers tree seedlings, technical assistance and generous multi-year subsidies to support farmers' investment in the years it takes to grow such trees.

While the program is not yet national in scope, with its initial focus on marginalized communities in the southern part of the country, it is ambitious. By the end of this year, the government hopes to have nearly half a million farmers enrolled, with some 1.4 million trees planted on more than 2.5 million acres of farmland. In addition to addressing poverty through initial cash payments and long-term sources of cash from trees, such agroforestry schemes have been shown to reduce soil erosion and increase natural soil fertility, reducing the need for synthetic fertilizers.[27] It remains to be seen if this program will have such positive impacts.

There is little data on the additional food production that might come from such a long-range productivity investment, but government officials are optimistic that the country will start to see rising yields of priority food crops from improved soils. Earlier pilot programs run by Mexico's national agricultural research institute, INIFAP, showed a doubling of corn yields on small-scale farms, a more than twofold increase in carbon sequestered in the soil and rising incomes for farmers.[28]

Price Supports (Precios de Garantia) seeks to address directly the challenges posed by dumping and by generally low or volatile prices for basic food crops. The program sets a guaranteed minimum price for corn, beans, wheat, rice and milk for an initial portion of small and medium-scale producers' crops. For small-scale producers of corn and beans, the government directly purchases, stores and distributes the farmers crops at prices 30-40% higher than market prices. The government also procures from farmers with fewer than 35 dairy cows an initial quantity at a guaranteed price. For medium-sized producers, who are generally producing for the commercial market, the government will generally guarantee purchase prices of higher volumes of production at slightly lower prices, which are still well above market prices. Rather than purchase the crops, the government covers the cost of financial instruments that guarantee prices for producers.[29]

The goal of the program is to stimulate production from small and medium-scale producers by offering them a remunerative price, in advance, for their crops. This both addresses the unfair competition from dumped imports and provides investment security against volatile commodity prices. As such, it is the one government program that directly addresses dumping by offering Mexican farmers domestic prices that are profitable. That guarantee should increase investment and generate rising production of priority food crops.

Early evaluations have been mixed. Small-scale corn and bean farmers benefited, showing significant increases in production with guaranteed price, and improvements in economic welfare as a result. But the overall impact on production was small because small-scale farmers are dispersed, many produce for subsistence, not the market, and government infrastructure for storage of purchased crops was lacking.

Price support programs for medium-scale commercial producers were more encouraging. Guaranteed wheat prices in 2019, for example, were 41% above market prices, which were depressed by U.S. dumping. The government got participation from 21% of wheat farmers, accounting for an impressive 55% of national production, and wheat production from those farmers increased 30%. Dairy price supports reached 44% of eligible farmers, but the data is unclear as to the overall impact on milk production.[30]

Overall results for the Price Support Program are less clear because it faced several obstacles, some of its own making. Previous governments had largely dismantled the infrastructure for purchase, storing and distributing procured crops, and the capacity was lacking to handle all the purchases initially envisioned. The government purchased 800 warehouses closer to farmers to increase that capacity. But the government also suffered a corruption scandal within Segalmex, the entity carrying out the purchasing.

Such a Price Support Program shows promise for increasing the incentives for farmers to increase production of priority food crops. Such programs can be particularly effective during periods of U.S. dumping and low prices if producers can plant their crops knowing they can get a good price.

Conclusion: Swimming against the tide

Through 2022 there is only limited evidence of increases in domestic production in the five priority foods (Figure 12, 13). It would perhaps be surprising to see gains in the first years of the programs given the disruptions of the pandemic and the need to rebuild the infrastructure for such programs after three decades of neoliberal policies. In recent years, wheat has shown some encouraging growth. Corn and bean production have yet to show signs of dynamism at a national level. Dairy has maintained slow, steady growth but without any boom in production strong enough to reduce import demand. Rice production remains relatively low with consumption heavily supported by imports.

U.S. dumping after NAFTA and more recently from 2014 to 2020 has made it even more difficult to stimulate domestic production. Low import prices make it hard for producers to compete; they also discourage investment, the key to expanding productivity. As we showed, corn, wheat and rice came into Mexico in those years at prices significantly below what it cost to produce them in the U.S. Dumping margins of 10% for corn and 27% for wheat resulted in losses of $3.8 billion and $2.1 billion on the value of Mexican farmers' crops from 2014 to 2020, with smaller losses for rice. Under such conditions, it is difficult to persuade farmers to increase investment and expand production. Only in the last two years have crop prices been favorable to Mexican government efforts to increase production of priority food crops.

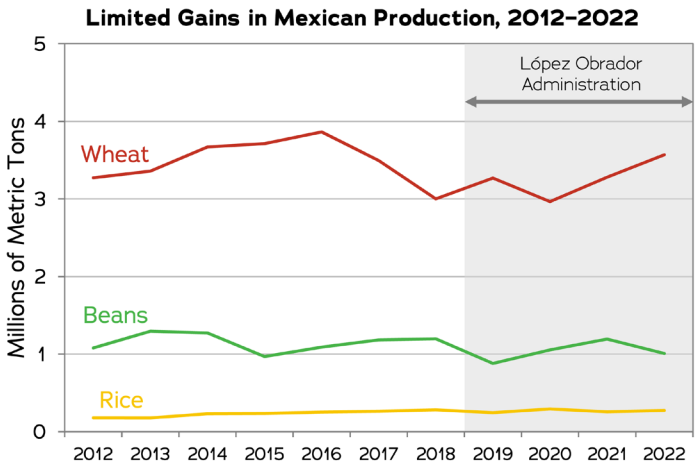
Strong domestic demand for those crops can serve as an important stimulus to producers, a prerequisite for the kind of rural revitalization the López Obrador administration is advocating. Up to now, U.S. exporters have been capturing those growing markets.

NAFTA and its successor agreement, the U.S.-Mexico-Canada Agreement (USMCA), outlaw most of the policy measures governments have traditionally used to stimulate domestic production. Protective tariffs have been the most common instrument, shielding domestic producers from international competition by raising the price of imports through border taxes. Such measures can be particularly important and effective when a country experiences a surge in imports, as Mexico did after NAFTA, and when some of those products are sold at dumping-level prices. NAFTA and the USMCA exclude most such measures among the three trading partners, and previous Mexican governments have declined to make active use of what measures remain.

One of the lessons from this study is that developing countries should be very wary of signing trade agreements like the USMCA that so severely constrain the government from taking protective measure while failing to discipline exporters for agricultural dumping.

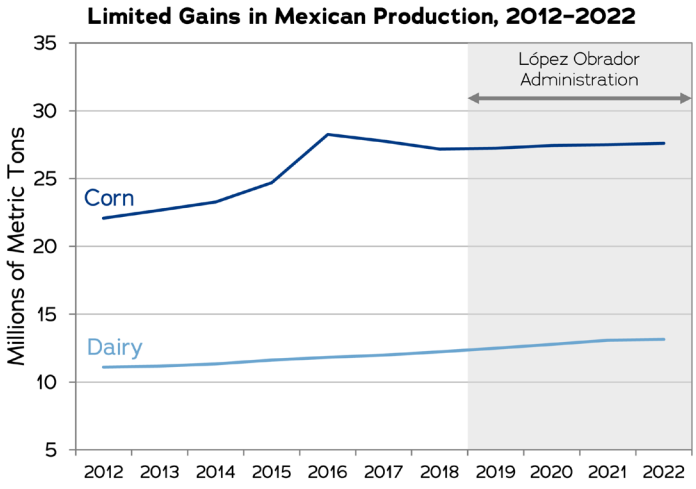
The policies the López Obrador administration has put in place have the potential to stimulate domestic production of key food crops. Producción para el Bienestar, the main farm subsidy program, now focuses on small and medium-scale producers, where yields remain well below potential. And while the subsidy

Figure 12.



Source: SAGARPA, SIAP, 2023; FAOSTAT, 2023

Figure 13.



Source: SAGARPA, SIAP, 2023; FAOSTAT, 2023

itself is not conditioned on productivity enhancements, the added provision of support for inputs and a dramatic expansion of technical assistance should lead to increased production. So too should the promotion of agroecological farming, from the expansion of biofertilizer production and use and the attention to long-term improvements in soil fertility. Sembrando Vida, the agroforestry program, provides significant subsidies to underwrite the medium-term costs of growing trees on agricultural land, which should also lead to improved soil fertility and increasing crop production. Finally, the Price Support program, Precios de Garantía, could provide significant numbers of producers with stable and remunerative prices, directly addressing the disincentive of cheap imports and dumping. That will be more important, and more effective, when crop prices fall to pre-pandemic levels. If the government pursues new initiatives to expand domestic production of animal feed, we could see a reduction in yellow corn imports.

In trying to reverse decades of rural neglect and U.S. dumping, the Mexican government is swimming against some very strong tides, currents made more treacherous by a trade agreement that severely limits what strokes Mexico can employ. Reducing import dependence and increasing domestic production of priority food crops are worthy goals, for a variety of reasons: poverty reduction, rural development, increased resilience to price and supply shocks, greater control over the quality of the food Mexicans consume and even national security.

International prices are relatively high now due to pandemic supply disruptions and the Russia-Ukraine war. Most economic models predict a return to crop prices nearly as low as they were from 2014 to 2020 (see Appendix 2). Of course, international agricultural markets are prone to volatility, even more so with the rising impacts of climate change and geopolitical conflicts. But U.S. agricultural dumping is likely not a thing of the past: It is a feature of U.S. industrialized agriculture prone to overproduction and below-cost prices to farmers. This is not just bad for Mexican farmers forced into competition with more industrialized U.S. farms. It is bad for U.S. farmers and rural communities, as low prices undermine local economies and leave farmers dependent on an expensive but inefficient set of government subsidies. Wisconsin's struggling family dairy farmers have a great deal in common with their counterparts in Mexico.

In that context, the U.S. government should remember that trade practices such as agricultural dumping are unfair and are proscribed by a range of international trade agreements. When the U.S. is routinely exporting key food products at dumping-level prices and offering many of its farmers crop subsidies to make up for those chronically low prices, it is hypocritical to then decry the Mexican government's efforts to reclaim some measure of its lost food self-sufficiency.

APPENDIX 1: METHODOLOGIES AND DATA USED IN THIS REPORT

This study presents trends in U.S. exports of key food crops to Mexico since NAFTA, the dumping margins that left many of those crops below what they cost to produce, the fall in producer prices that resulted from that downward pressure on prices, the extent to which low prices reduced Mexican domestic production and the estimated costs to Mexican producers of those suppressed prices. These are the sources and methodologies used to generate the data.

U.S. exports — Using U.S. Department of Agriculture, we estimate the increase in U.S. exports to Mexico of key crops and animal products. We use three-year averages to smooth annual variations, reporting three intervals:

Pre-NAFTA — a baseline of 1990-2, prior to NAFTA's implementation in 1994.

Post-dumping — 2006-8, after the 1997-2005 period of U.S. dumping.

Recent — 2018-20, at the end of the 2014-20 period of dumping and prior to the disruptions of the pandemic and the Russia-Ukraine war.

In the current study, we do not report on cotton or soybeans because cotton is not a food crop and Mexico lost most of what little soybean production it had after NAFTA.

Sources: USDA – Foreign Agricultural Service, Global Agricultural Trade System (GATS) Online, February 2023, https://apps.fas.usda.gov/gats/default.aspx.

Dairy data, 1990-2022: USDA – Foreign Agricultural Service, Production, Supply, and Distribution (PSD) Online, February 2023, https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery.

Mexican production — We rely mainly on Mexican government data sources, using the same time periods to measure changes in Mexican production in order to gauge the extent to which the surge in low-priced U.S. exports affected domestic production, measured by volume.

Sources: SAGARPA, Servicio de Información Agroalimentaria y Pesquera (SIAP), February 2023, "Anuario Estadístico de la Producción Agrícola" https://nube.siap.gob.mx/cierreagricola/ and "Anuario Estadístico de la Producción Ganadera" https://nube.siap.gob.mx/cierre_pecuario/. Cross-checked with USDA – Foreign Agricultural Service, Production, Supply, and Distribution (PSD) Online, February 2023, https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery, and FAO, FAOSTAT, February 2023, "Crops and Livestock Products" https://www.fao.org/faostat/en/#data/QCL.

Defining agricultural dumping — Article VI of the 1994 General Agreement on Tariffs and Trade (GATT, the precursor to the World Trade Organization) defines dumping in two ways. One is the exporting of a good a price lower than the good is sold domestically or lower than it is sold to other importing countries. Article VI provides a second definition of dumping for cases in which the domestic price is too distorted to provide a useful reference. Prices distorted by large subsidies qualify under this definition: *"…the margin of dumping shall be determined by comparison with…the cost of production in the country of origin plus a reasonable amount for administrative, selling and general costs and for profits."* (See Appendix 2.)

Estimating dumping margins — Average dumping margins are reported for two periods in which they took place, 1997-2005 and 2014-2020. IATP adds the cost of transportation and handling to the average farmer production cost to calculate the full cost of production, adding in an estimate of government subsidies for inputs (a direct government contribution to costs unlike other government payments). The estimate of export dumping is the difference between the full cost of production and the export price, with the dumping margin being that amount divided by the full cost of production.

Sources: Farmer production costs are from USDA Commodity Costs and Returns. Government Support Costs are from OECD Producer Support Estimates Database. Transportation and export prices are based on information in USDA Agricultural Marketing Services Grain Transportation Report Datasets. For wheat, corn and soy, we used Table 2: Market Update: US Origins to Export Position Price Spreads. For rice: Rice Yearbook, Table 17: Milled rice:

Average price, f.o.b. mills, at selected US milling center. For cotton: National Cotton Council of America's A Index of global prices.[32]

Domestic producer prices in Mexico — Using government sources and adjusting for inflation, we estimate the change in prices from before NAFTA, 1990-2 to the end of the first dumping period in 2005, to gauge the real price impacts on Mexican producers from the post-NAFTA surge in exports. We then use three-year averages to estimate producer-price trends from 2003-5, their low point after U.S. dumping and prior to the food price spikes of 2007-8, to 2018-20, the end of the most recent period of dumping. The goal is to assess whether producer prices recovered of if they continued to fall with the recent dumping.

Sources: U.S./Mexico producer prices, 1990-2021: FAO, FAOSTAT, February 2023, "Producer Prices" https://www.fao.org/faostat/en/#data/PP

Estimating farmer losses to U.S. dumping — Following a methodology developed for Wise's earlier dumping study, we assume that producer prices in Mexico are reduced by the percentage of the dumping margin for the years in which dumping took place. We apply that to the volume of Mexican production for each crop in those years to estimate the lost value from dumping-related price suppression, e.g., we assume that Mexican corn farmers' crops would have been worth $3.8 billion more between 2014 and 2020 if U.S. corn exports had not been 10% below their costs of production.[33] The total losses for each dumping period are reported by crop for the products for which IATP has calculated dumping margins. Mexican government policies cushion the impacts of such losses for some farmers, as the U.S. government does with its farm subsidies, so the losses reported here should be viewed as the reduced value of Mexican farmers' production.

Animal products — We do not extend Wise's earlier dumping estimates for animal products, though we report his results. There, he estimated the extent to which below-cost feed components (corn and soybeans) reduced U.S. production costs for factory farms producing meat, generating a dumping margin from that one component. IATP does not estimate dumping margins for animal products because of the complexity involved in determining costs. Still, we report here on the export, production and price trends for key animal products because they are an important component of cross-border food trade and because dairy is one of the five priority food products the Mexican government is focused on for reducing import dependency.

Import dependency — This is measured using three-year averages to compare 1990-2, 2006-8 and 2019-21 (the most recent year for which data was available). Import dependency is the share of imports in total national consumption. In the case of dairy and beef, we report dependency on U.S. imports only and exclude exports in the estimation of national consumption.

Sources: Above sources with additional data from Mexican government SAT/SIAT.[34]

APPENDIX 2: AGRICULTURAL DUMPING

IATP has documented the extent of dumping of several key commodity crops for more than twenty years. The General Agreement on Tariffs and Trade (GATT), the precursor to the World Trade Organization and the agreement on which most current trade law is based, provides two definitions of dumping.[35] Article VI of GATT 1994 states that a product will be considered as being dumped if it is "introduced into the commerce of another country at less than its normal value…." The first method of determining dumping is the more commonly understood:

"…if the export price of the product exported from one country to another is less than the comparable price, in the ordinary course of trade, for the like product when destined for consumption in the exporting country."

In other words: exporting at prices below the domestic price for the same product. For example, exporting surplus dairy purchased from farmers at a profitable price to a foreign country with the surplus sold at a discount. That practice is considered unfair trade because it is a proven way for exporters to gain market share in a foreign market by underselling local producers.

Article VI provides a second definition of dumping for cases in which the domestic price is too distorted to provide a useful reference. Prices distorted by large subsidies qualify under this definition:

"…the margin of dumping shall be determined by comparison with…the cost of production in the country of origin plus a reasonable amount for administrative, selling and general costs and for profits."

With U.S. agricultural prices distorted by government policies (not to mention high levels of market concentration), it is reasonable to apply the second definition of dumping to U.S. exports to Mexico. The U.S., in an anti-dumping case against Canadian dairy exports, used this definition, and it was upheld by the WTO's appellate body. The same decision recognized the use of average costs of production for comparison purposes.[36]

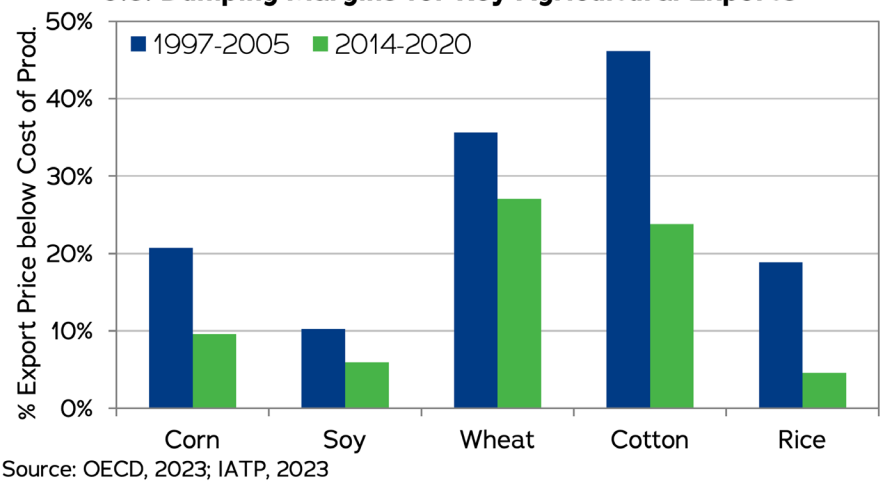
IATP founder Mark Ritchie, working with agricultural economist Gigi DiGiacomo, developed a methodology for calculating dumping using this definition of exporting at below cost. They relied on data from the U.S. Department of Agriculture (USDA) and the Organization for Economic Cooperation and Development (OECD) average production costs, prices at the farm and at the point of export, input subsidies and estimated transportation costs for wheat, rice, corn, soy and cotton.[37] IATP has regularly updated these figures to identify periods of U.S. export dumping.[38]

Two such periods, 1997-2005 and 2014-2020, had a particular impact on Mexico because of the surge of U.S. agricultural exports that flowed into Mexico after NAFTA went into effect in 1994 and after the 1996 Farm Bill gutted the last remaining supply-management policies.

Note that in this type of dumping, farmers in the exporting country are paid prices for their crops that do not cover the costs of production. Government subsidies make up some of the losses for some farmers, but U.S. agricultural subsidies are not the primary cause of agricultural dumping. Instead, industrialized agriculture exhibits a natural tendency toward overproduction, which results in low prices that have proven economically disastrous, such as during the Great Depression.

For a period of time after the New Deal, U.S. leaders established so-called supply-management policies to keep production in rough balance with demand. Those policies took some land out of production and ensured profitable prices for farmers. Starting in the 1970s, such policies began

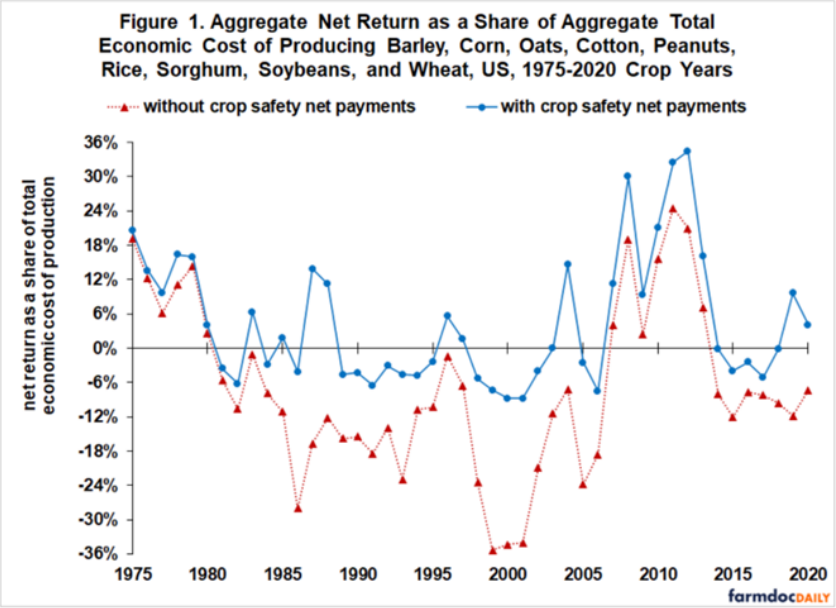
U.S. Dumping Margins for Key Agricultural Exports



Source: OECD, 2023; IATP, 2023

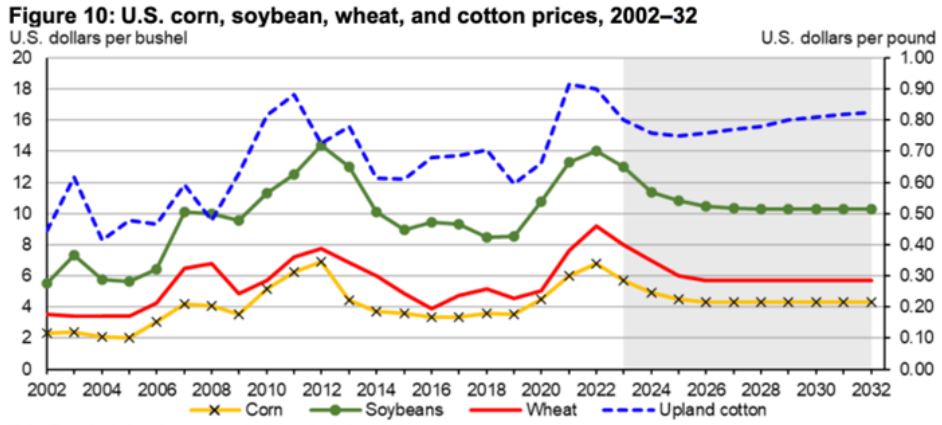
to be eroded, in part to encourage production for export. By 1996, the farm bill dubbed the Freedom to Farm Act eliminated supply management. The immediate surge in overproduction and low prices generated the policy response we still see today: government subsidies making up for some farmers' losses in a market that favors maximum production.[39]

Agricultural policies (including subsidies) that encourage overproduction of commodity crops such as corn drive prices below the costs of production. The main beneficiaries are not U.S. farmers, who see prices depressed by such policies, but agribusiness firms, which benefit from maximum sales of their inputs, on the production side, while others cash in on farm goods sold below the costs of production.[40] This has fed the rise of industrial livestock firms that get an "implicit subsidy" for their feed costs. Where before they paid a government-supported price for their corn and soybeans, now they get substantial discounts with the government picking up the cost of keeping farmers solvent.[41]



Such so-called safety-net policies do not mask the economic impact of chronically low U.S. crop prices. USDA recently presented the following graph to show that subsidies lifted farm incomes into the black in many years. But the remarkable thing about the graph is that the lower line measures net farm income without subsidies for all government-supported crops, and it is negative in all but seven of 40 years since 1980. The only respite came between 2007 and 2013, which we can attribute to the ethanol boom boosting demand for corn, the financial crisis adding to food-price spikes and a drought in 2011 that cut U.S. production. Even with government payments, represented by the top line, net farm income is still negative in 25 of the 40 years. This illustrates the chronic nature of U.S. overproduction of key commodity crops in the absence of policies to better manage supply.

Despite the current jump in crop prices in 2021 and 2022 with the pandemic disruptions and the Russia-Ukraine war, dumping is likely to resume in the future. As the following graph shows, USDA's long-term projections for key crops suggest a return to low crop prices.



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