



FRUITS AND VEGETABLES: GLOBAL VALUE CHAINS EXPLAINED

BRIEFING NOTE SERIES

Briefing Note 1 |

Understanding costs and prices in
global value chains for fruits and vegetables

Fruits and vegetables continue to offer exceptional value to consumers, both in money terms and for their health. A clear narrative around affordability and nutritional value will ensure continued consumer confidence in fruits and vegetables as an essential and cost-effective part of a balanced diet.

At the same time, it is crucial to explain the inflationary pressures and disturbances that affect global supply chains for fruits and vegetables. This will help consumers appreciate the complexities and investments required to bring fresh produce from the farm to the table.

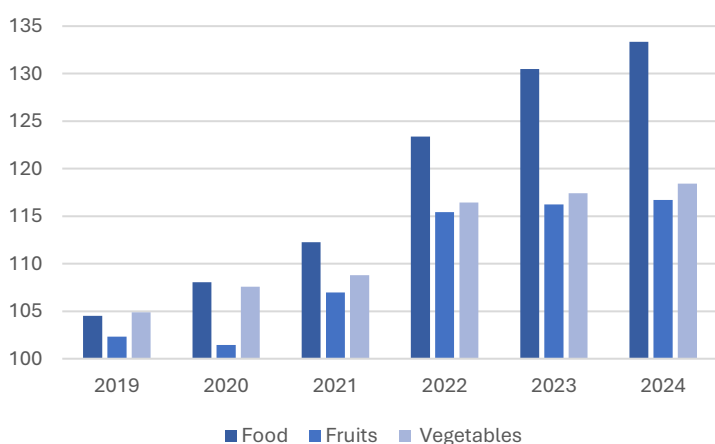
Global Coalition of Fresh Produce

Globally, there has been an upward trend in consumer prices for food, including fruits and vegetables, in recent years. This trend was most marked during and immediately after the COVID-19 crisis and has lessened since.

However, prices for fruits and vegetables generally rose less than those for other foods. This means that fresh produce remains highly competitive compared to other food categories, and one of the most cost-effective choices for consumers. Unlike processed foods, fruits and vegetables provide essential nutrients at a lower cost per serving.

In the **United States of America**, consumers paid 4.5 percent more for their food in 2019 than in 2015. By 2024, they were paying 33.6 percent more compared to 2015. For fruits and vegetables, the price increases were less significant. In 2019, fresh fruits cost 2.3 percent more than in 2015; by 2024, the difference stood at 16.7 percent. Meanwhile, fresh vegetables cost 4.9 percent more in 2019 than in 2015, and 18.4 percent more in 2024.

United States of America, consumer price index for food, fruits and vegetables, 2019 to 2024 (2015 = 100)

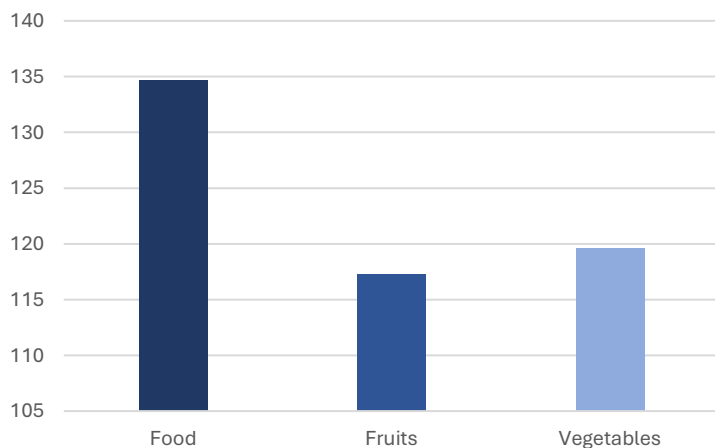


The relative stability of fresh produce prices testifies to the efficiency and resilience of the fresh produce supply chain in the face of challenges such as supply chain disruptions and climate-related impacts.

Source: compilation by the Global Coalition of Fresh Produce, based on US Bureau of Labor Statistics.

Food prices followed a very similar trend in **Canada**, rising by 5.4 percent between 2015 and 2019, and by 34.7 percent between 2015 and 2024. As in the United States of America, prices for fruits and vegetables increased much less than those for other foods: prices for fresh fruits rose by 17.3 percent from 2015 to 2024, while those for fresh vegetables increased by 19.6 percent.

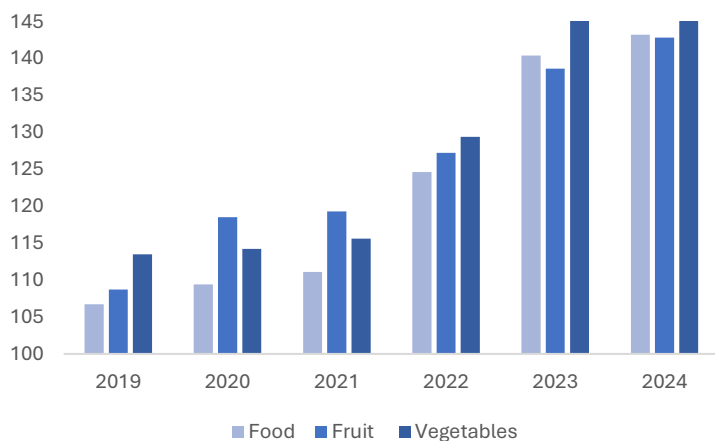
Canada, consumer price index for food, fruits and vegetables, 2024 (2015 = 100)



Source: compilation by the Global Coalition of Fresh Produce, based on Eurostat.

Meanwhile, in the **European Union**, food cost 6.7 percent more in 2019 than in 2015. By 2024, this difference had risen to 43.2 percent. The cost of fruits reflected that of food in general, with fresh fruits costing 8.7 percent more in 2019 than in 2015, and 42.8 percent more in 2024. Prices of vegetables saw steeper increases: up 13.5 percent compared to 2015 in 2019, and up 51.4 percent in 2024.

European Union, consumer price index for food, fruits and vegetables, 2019 to 2024 (2015 = 100)



Note: data for 2024 are for the period January to November. Source: compilation by the Global Coalition of Fresh Produce, based on Eurostat.

Generally, prices paid by consumers for fruits and vegetables have risen less than those of other foods in recent years. Fruits and vegetables thus continue to offer exceptional value to consumers – in both money and health terms.

Fresh produce constitutes a fundamental element of a healthy diet, offering a myriad of benefits. A diet abundant in vegetables and fruits has been associated with lowered blood pressure, reduced risks of heart disease and stroke, prevention of certain cancers, decreased likelihood of eye and digestive issues, and a positive impact on blood sugar levels, contributing to appetite regulation. By adopting such a diet, an individual can save hundreds or thousands of dollars on health care over the course of a lifetime. It has been estimated that in the United States of America, a person with three to four chronic diseases will spend USD 25 000 annually on health care expenses, while individuals without any chronic diseases will spend USD 6 000 annually.ⁱ In Canada, research has shown that over three quarters of the population do not meet the recommended daily servings of fruits and vegetables, leading to an annual economic burden attributable to inadequate fresh produce consumption of CAD 4.39 billion. If Canadians improved their diets by eating just 1 percent more fruits and vegetables annually, the cumulative reduction of the economic burden between 2013 and 2036 could reach CAD 8.4 billion.ⁱⁱ

Investing in increased fruit and vegetable consumption can lead to significant healthcare cost savings and improved public health outcomes.

The benefits of eating more fruits and vegetables, for individuals and for the society at large, will be discussed in greater detail in one of the Coalition's next Briefing Notes. Stay tuned!

Do higher prices paid for fruits and vegetables in supermarkets and grocery stores mean that growers are making more money?

Not necessarily. Consumers in the United States of America, for example, are forecast to pay between 0.6 and 0.9 percent more for their fruits and vegetables, respectively, in 2024 compared to 2023. At the same time, farm-gate prices are expected to fall or grow slowly on average in 2024: prices for farm-level fruits are predicted to decrease by 1.9 percent, while prices for farm-level vegetables are expected to increase by 0.5 percent. Net farm income is expected to decline by 6.3 percent in 2024, signifying **continued financial strain** for the agricultural sector.

Source: USDA ERS, Food Price Outlook (data for 2024: January to November).

The prices paid by consumers for fruits and vegetables are influenced by a range of factors, which are often poorly understood. The variability of fruit and vegetable prices is partly due to their perishable nature, which means they are easily impacted by changes in the weather, supply chain disruptions, and other short-term factors. In addition, most fruits and vegetables are grown at specific times of the year, so there is an abundance of produce available at its peak. At either end of the peak, the price may be significantly more due to the simple law of supply and demand. As a result, fruits and vegetables often experience seasonal price fluctuations, which can make their price movements distinct from other food items.

To better understand why and how prices for fruits and vegetables fluctuate, it is crucial to highlight the investments and challenges involved in producing fresh fruits and vegetables:

Agricultural investments and sustainability

- **Land and water management:** farmers invest in sustainable water use, soil health, and conservation efforts to ensure long-term production viability.
- **Input costs:** the industry continues to grapple with substantial cost increases across various inputs such as construction materials, fertilizers, fuel, machinery, and shipping services.
- **Extreme weather:** extreme weather conditions reduce yields, while adapting to these conditions requires significant investment in irrigation systems, protective structures, and resilient crop varieties.

Labour costs

- **Labour shortages and rising wages:** the fresh produce industry is labour-intensive, and wage increases affect overall costs.

Compliance costs

- **Food safety and sustainability requirements:** compliance with global food safety and sustainability standards requires ongoing investment in audits, training, and facility upgrades.

Logistics

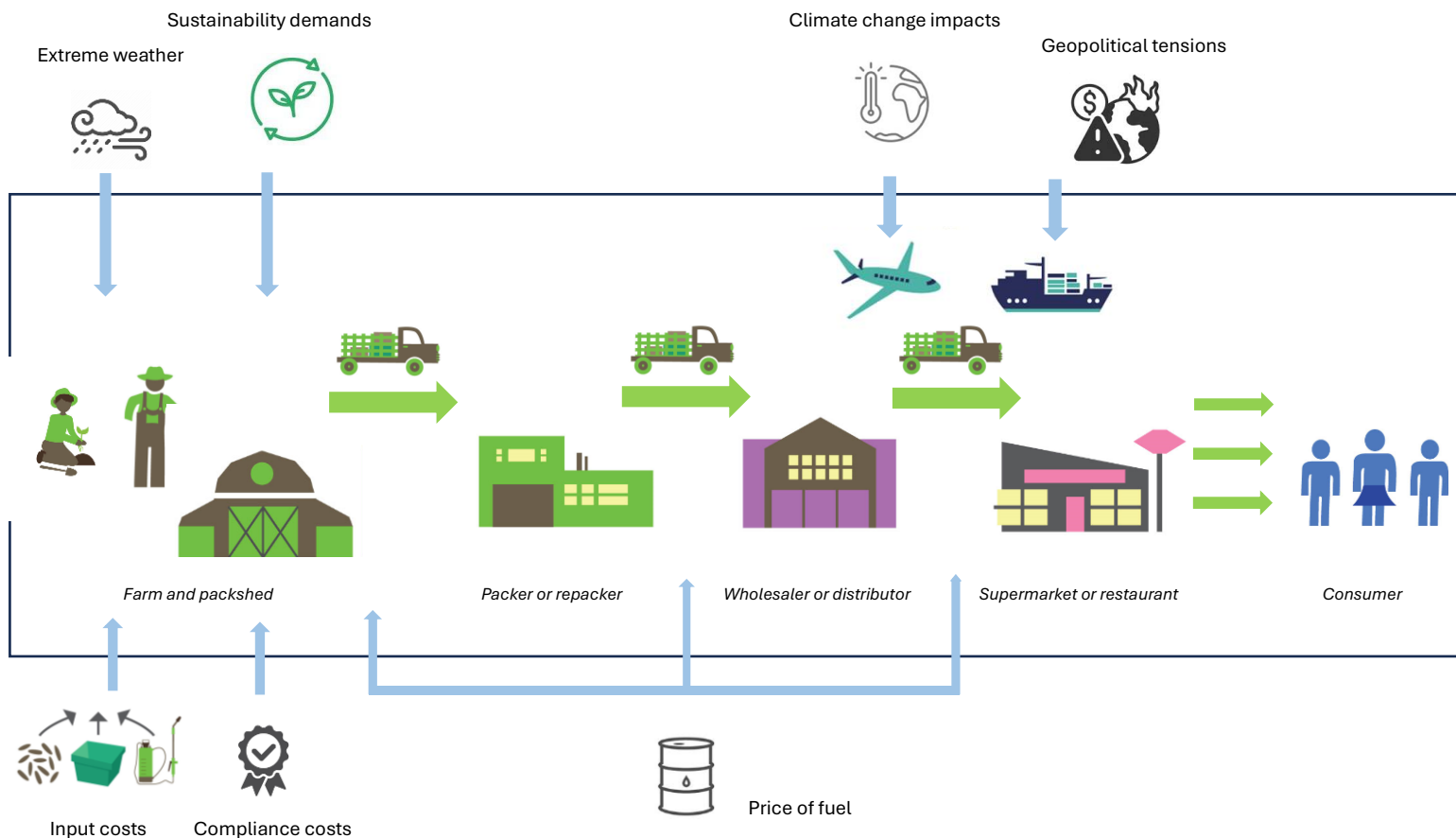
- **Transportation and storage:** fresh produce requires specialized handling, including refrigeration and quick transit times, increasing logistical costs.
- **Shipping and freight rates:** disruptions in shipping routes and increased freight rates add to the cost of delivering fresh produce to consumers.

Taxes and regulatory costs

- **Environmental taxes and regulations:** the push for sustainability has led to additional limitations on taxes on carbon emissions, packaging, and energy use.
- **Import duties:** trade policies impact pricing structures, influencing the final cost to consumers.

SUPPLY CHAIN CHALLENGES SUCH AS HIGHER PRODUCTION COSTS, EXTREME WEATHER CONDITIONS, LOGISTICAL BOTTLENECKS AND GEOPOLITICAL TENSIONS EXERT INFLATIONARY PRESSURE ON GLOBAL SUPPLY CHAINS FOR FRUITS AND VEGETABLES – WITH LITTLE SIGN OF ABATING IN THE FORESEEABLE FUTURE.

Challenges in global value chains for fruits and vegetables – cost pressures and disruptions



Extreme weather

Depending on their location, growers of fruits and vegetables may be confronted with phenomena such as heatwaves, cold spells, heavy rains, storm surges, flooding, landslides, droughts, wildfires and intense storms bringing wind and hail. The result of such adverse weather events is that in many cases there is less produce available, and therefore prices go up. A study published in *Nature* in March 2024 shows that fluctuations in weather conditions, and especially in average monthly temperatures, strongly and consistently affect food inflation.ⁱⁱⁱ This is indicative of a supply-side productivity shock, given the considerable evidence for impacts on agricultural production from temperature, rainfall patterns and other weather fluctuations. In 2024, extreme weather conditions significantly impacted fruit and vegetable production around the world. In the United States of America, widespread drought conditions affected large portions of the country, leading to reduced yields and higher prices for many crops, particularly in the Midwest and Southern regions. Heavy rains in certain areas also caused damage to crops, while heatwaves further stressed plants, resulting in lower quality and quantity of produce overall. The agricultural landscape across Europe was significantly impacted by a series of weather extremes too, from unusually wet conditions in the north to severe droughts in the south, posing a challenge to farmers and affecting crop yields. The frequency of extreme weather events in Europe has increased by nearly 50 percent over the last two years.^{iv} This escalation has profound implications for agriculture across the continent. A recent study by Inverto highlights the growing crisis, revealing a 48 percent increase in extreme weather events from the year leading to February 2022 to the year leading to February 2024. The study also noted a 72 percent increase in large hailstorms during the same period.^v

Adapting to extreme weather requires significant investment in irrigation systems, protective structures, and resilient crop varieties.

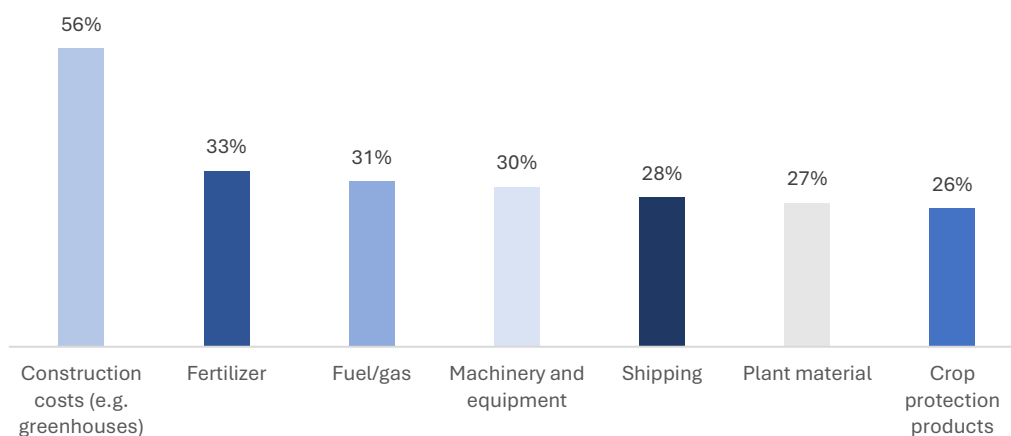
In the long run, climate change is expected to significantly affect fresh produce production patterns worldwide. For example, many European varieties need a long cold winter to produce good fruit in summer, and climate change is disrupting their natural cycles. As average temperatures rise, winters are no longer cold enough to ensure regular flowering, causing major declines in production. In addition, changes in temperature and precipitation influence the spread of pests and diseases, bringing new challenges for growers.

Cost of agricultural inputs

Fresh produce farmers use a wide range of inputs, including seeds or planting stock, agrochemicals such as fertilizers, herbicides, fungicides, and pesticides, farm equipment such as planting or harvesting machinery or irrigation systems, energy (electricity, gas, fuel) and water.

Surveys carried out by the Global Coalition of Fresh Produce in 2023 and 2024 have shown that while the cost hikes seen during and immediately after the COVID-19 crises have abated somewhat, the industry continues to grapple with substantial cost increases across various inputs such as construction materials, fertilizers, fuel, machinery, and shipping services. In 2024, over four fifths of operators in the global fresh produce industry saw the costs of inputs, labour, and shipping go up further, with the prices of construction materials (+56 percent), fertilizers (+33 percent), fuel and gas (+31 percent), machinery and equipment (+30 percent) and shipping services (+28 percent) showing the most significant increases.

Increases in horticultural input prices (year-on-year, May 2024)



Focus on ... oil

Why are food prices so influenced by the price of oil? First and most obviously, fuel is a direct input for running tractors and other farm equipment. Expensive oil also increases the cost of transporting goods to market, and fruits and vegetable often have to travel long distances over land, sea or via air. Fossil fuels are important further back in the supply chain as well. Natural gas (the price of which is tightly linked with that of oil) is a major component in the production of fertilizer. Meanwhile, the manufacturing of pesticides is extremely energy-intensive and in some cases uses petroleum products as an ingredient. Thus, increases in energy prices may have an effect on many items from production to delivery of products to final consumers. These items include but are not limited to fertilizers, chemicals, irrigation, production, storage, and transportation.

Costs of compliance with standards for social and environmental sustainability

Since the 90s, growers worldwide have been faced with an ever-growing number of requirements related to social and environmental sustainability and food safety. Retailers are demanding that their suppliers obtain private certification to prove their compliance with these requirements. The past two decades have seen a proliferation of private certification and labelling schemes for social or environmental sustainability and food safety in the agrifood sector. This evolution reflects the strategies of major retailers towards meeting consumer demands and fulfilling “due diligence” requirements for sustainability while transferring the responsibility for risk management to suppliers, thus increasing their own profitability and market share. As a result, fruit and vegetable suppliers, and especially those operating internationally, must comply with the requirements of multiple, sometimes retailer-specific standards and schemes. The Standards Map of the International Trade Centre lists over 340 standards that apply to fresh fruits and vegetables worldwide, including, for example, GlobalGAP, IFS, BRCGS, SMETA, BSCI, ISO 26000/14001, Rainforest Alliance, Fairtrade, Nurture (Tesco), etc.^{vii} One study showed that South African produce farmers were subject to up to six different environmental farm audits in a given year.^{viii} In Europe, the average fruit or vegetable grower complies with seven to nine certification standards related to sustainability alone (i.e. not including standards for food safety), with around 60 percent of requirements being duplicated by two or more standards – and hence two or more audits.^{ix} While costly control measures and third-party certification are required by downstream buyers, they are mostly paid for by upstream suppliers. The costs of complying with multiple private standards, and the additional costs of certification, impose unnecessary cost and time burdens on suppliers and create a risk of exclusion, especially of small-scale producers and operators in developing countries.

It is estimated that the average fruit grower in South Africa spends 10 percent of their gross income to comply with private standards for social and environmental sustainability and food safety.^{vi}

Shipping disruptions and freight costs

Disturbances in key global trade routes are straining supply chains by extending shipping routes and raising costs – with profound impacts on food security, energy supplies, and the global economy. Attacks by Houthis on ships in the Red Sea, where 15 percent of global seaborne trade passes, have reduced trade volumes in the **Suez Canal** by about 40 percent as shipping companies have moved to reroute shipments around the southern tip of Africa – a route that is some 3 500 nautical miles and 10 days longer.^{x,xi} Meanwhile, unpredictable weather patterns around critical routes such as the Cape of Good Hope add further complexity to operations. There is little prospect of the situation in the Red Sea improving in 2025. With little chance of improvement in 2025, disruptions will continue to affect freight rates, transit times, capacity, and congestion.^{xii}

Meanwhile, drought conditions have disrupted shipping through the **Panama Canal**. In 2023/24, Panama suffered one of its most severe droughts on record, exacerbated by a strong El Niño and record-breaking global warming. In response to dropping water levels, the Panama Canal authorities were forced to limit the number of daily passages through the canal, at one point by as much as 40 percent. This caused long delays, drove up transit prices, and destabilized shipping routes. Though the canal is currently operating at full capacity, a drier climate and rising freshwater demand are expected to further reduce the volume of water available to operate the locks, which means fewer ships can pass.^{xiii}

The disturbances in global shipping routes are causing significant increases in the average **journey time** of vessels, with average global container journey times increasing by approximately 20 percent year-on-year in August 2024.^{xiv} Longer routes complicate container repositioning, keeping freight rates high even when capacity is added. At the same time, **shipping reliability** is hitting new lows, with delays continuing to mount across global trade lanes as a result of geopolitical conflicts, port congestion, and severe weather. According to a recent report from Sea Intelligence, the average delay for containerships behind schedule has risen to levels that have not been seen since the peak of the COVID-19 pandemic.^{xv}

Disturbances in key trade routes, tight capacity, rate fluctuations, and unreliability are defining the current shipping landscape.

▲ + 36%

rise in global freight rate, 2019 to 2024

▲ + 20%

2024 increase in average container journey time

▼ - 40%

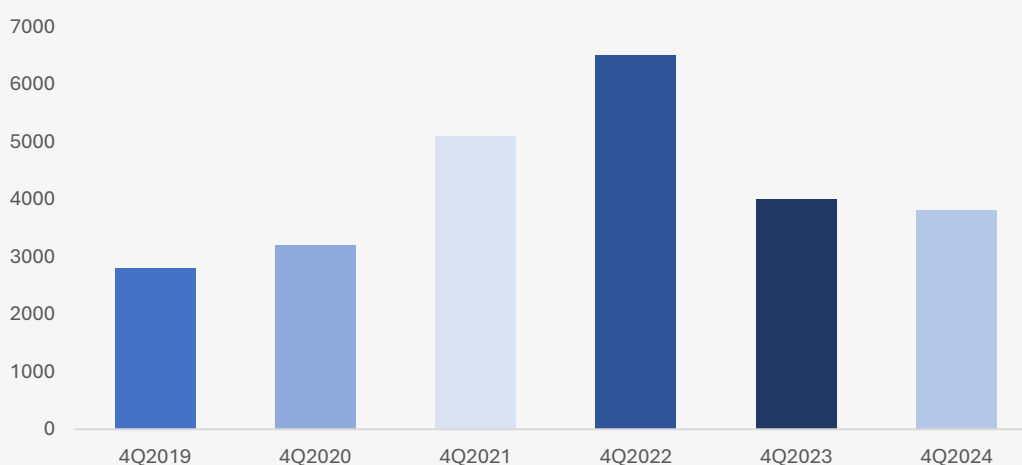
2024 decrease in vessels transitting the Suez and Panama Canals

The **global freight rate** for refrigerated containers has increased significantly since late 2019, when the going rate for a 40-foot container was under USD 3 000.^{xvi} This rate peaked at over USD 6 500 in Q3 of 2022, driven by heightened competition for reefer containers and shipping slots. By the end of 2024, refrigerated container rates had declined to just under USD 4 000 per container; below the peak reached during the COVID-19 pandemic, but still well above pre-COVID rates.

For the first quarter of 2025, reefer freight rates are trending upwards, with forecasts suggesting that rates will remain elevated for some time to come due to capacity constraints and rising operational costs. Indeed, a strong demand for reefer containers, coupled with rising regulatory compliance costs (including emissions reduction measures) and persistent instability in the Red Sea region that lengthens routes and limits effective capacity, all make freight rates unlikely to return to pre-pandemic levels.

Recent surges in freight rates and intensifying reliability issues are becoming a critical concern for global supply chains for fresh produce.

Global Reefer Container Freight Rate Index (USD/40-foot container), selected years



Source: Drewry.

Port congestion is a major challenge in global shipping, causing delays, driving up costs, and creating ripple effects throughout supply chains. It is estimated that **global port congestion** currently ties up 10.5 percent of the global fleet of freight vessels.^{xvii} An important driver of port congestion in 2024 were **industrial actions by port workers**, with further actions poised to contribute to another year of disruptions for global shipping in 2025.

In North America, port strikes were a major headline of 2024. In October 2024, union action effectively closed 14 major ports on the United States' East and Gulf Coasts for three days – affecting nearly one tenth of global container shipping volumes.^{xviii} Meanwhile, lockouts by dockworkers in Canada shut down ports in British Columbia and Montreal for over a week in November 2024. In March 2025, trade union action across major European ports, and particularly in Rotterdam and France, caused significant congestion, prompting carriers to reroute vessels and seek alternative solutions. In Rotterdam, dockworkers staged intermittent strikes over port automation concerns, thereby severely impacting port operations. Meanwhile, dockworkers in France are protesting against pension reforms, with frequent work stoppages and a series of strikes planned throughout March. With no immediate resolution in sight for either the Rotterdam or French port disputes, supply chain operators are bracing for continued volatility.^{xix}

Delays in cargo movements as a result of labour conflicts have profound consequences for global supply chains for fresh fruits and vegetables. Fruits and vegetables do not stop growing, and cannot be held in cold storage for extended periods of time when supply chains are obstructed. Produce will spoil if left on the docks for too long, or become more expensive given the delays and additional refrigeration requirements. Furthermore, rerouting fresh produce via alternative channels often results in significant cost increases.

Produce, in particular, has been hit by port delays with direct consequences such as spoiling, quality reduction, shelf life deterioration and higher costs.

All of these cost factors are inevitably reflected in the final price paid by consumers. The ongoing surge in freight rates, if sustained, will push global consumer prices up, with UN Trade and Development projecting a 0.6 percent increase by 2025 due solely to higher shipping costs.¹ Meanwhile, the Chartered Institute of Procurement and Supply warns that the price of household staples including food and drink could climb by as much as 20 percent in 2025 if challenges with sourcing and transporting goods continue.^{xx}

Volatile trade policies

The evolving tariff threats issued by the new US administration signal a turbulent 2025. Tariff uncertainties are already leading countries to diversify their exports away from the United States of America in fear of a looming tariff war. This could cause major shifts in global trading patterns, particularly for key refrigerated exports such as fruits and vegetables. But sharp tariff increases could not only disrupt global supply chains and stoke geopolitical tensions; in combination with reduced migrant labour supply and persistent fiscal deficits, they could also reignite inflation pressures in the United States of America. Importers, exporters and are concerned that tariffs will drive up production and distribution costs, at a time when the public is extremely sensitive to price increases.

The United States of America imports roughly 60 percent of its fresh fruits, and 40 percent of its vegetables, with Mexico accounting for over two thirds of total vegetable imports, and more than half of all fruit imports.^{xxi} If new tariffs are imposed, the cost burden would largely fall on importing companies—who would then pass these increases on to consumers. Among the fruits and vegetables that may be at risk of price hikes if the US administration move forward with tariffs on imports are avocados, tomatoes, strawberries, raspberries, bell peppers, cucumbers, squash and snap beans.^{xxii}

The fresh produce industry does not respond well to uncertainty. Supply chains and trade relationships take years to build, and existing production and distribution infrastructure cannot be easily shifted towards other origins or destinations in reaction to each shift in a volatile trade policy agenda.

But tariffs will not only affect consumer prices by making imported food more expensive. American farmers heavily rely on imported agricultural inputs (such as lumber for pallets or petroleum-based products), primarily from Canada and Mexico. Higher costs for these inputs would further strain an industry already struggling with rising production and distribution expenses – which will ultimately be reflected in the price for groceries paid by consumers. This result is the opposite of the administration’s pledge to bring down grocery prices for Americans, and inconsistent with the government’s broader policy goals to improve food affordability and food security.

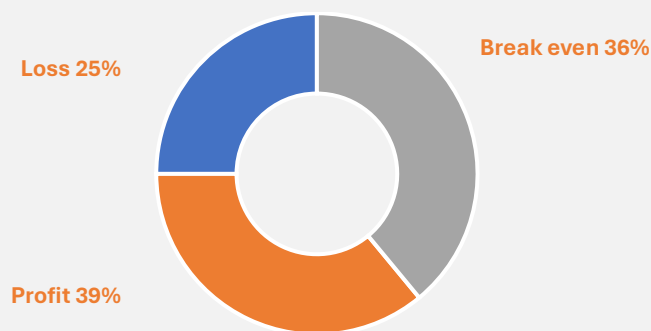


Together, increased production and trading costs and disturbances caused by armed conflict, extreme weather events, labour disputes and shifts in trade policies are putting enormous strain on major arteries of global trade in fruits and vegetables, forcing operators to prepare for delays, limited planning reliability and increased costs in production, shipping and warehousing. All of these cost factors are inevitably reflected in the final price paid by consumers.

The industry's economic viability

As shown in the previous sections of this Briefing Note, the global fresh produce industry continues to grapple with a daunting operating landscape characterized by geopolitical conflicts, climate change and inflationary pressures that disrupt global supply chains for fruits and vegetables, both directly and through their impacts on the supplies of inputs, such as energy and fertilizers. These compounding challenges are threatening the economic viability of fresh produce operations the world over. While the majority of respondents to the Global Coalition's 2024 survey into production and trading costs and prices reported an increase in average selling prices compared to last year, this increase was for the most part insufficient to offset rising operating costs. As a result, two fifths of the global industry was found to operate at a loss (25 percent) or break even (36 percent) in 2024. Alarming, more operators are operating at a loss in 2024 than in 2023 (19 percent). While fluctuating profit margins are a common occurrence in the fresh produce industry, the share of operators who are making a profit remains at the lowest level recorded over the past ten years.

Profitability in the global fresh produce industry (2024)



Confronted with continuing low or negative margins, operators are questioning their economic viability. Seventy percent of respondents in the Coalition's 2024 survey stated that are considering the possibility of closing their operations within the next two to three years. When asked about the factors posing the greatest threat to the medium-term sustainability of their businesses, nine out of ten respondents highlighted increases in input costs, followed closely by low selling prices. Other significant challenges undermining economic sustainability include rising labour costs, compliance costs associated with regulations and standards, inadequate profits for capital investments and innovation, and adverse weather events.

70%

of fresh produce operators are considering exiting the industry within the next two to three years

Top-3 reasons for leaving the industry

- increased input costs
- low selling prices
- increased labour costs

Source: Global Coalition of Fresh Produce, 2024.

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