



Cold Chain in Vietnam

Emerging Markets Program Assessment

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LIST OF ABBREVIATIONS

3PL	Third Party Logistics
APHIS	Animal and Plant Health Inspection Service
ASEAN	Association of Southeast Asian Nations
B2C	Business-To-Consumer
CA	Controlled Atmosphere
CAGR	Compound Average Growth Rate
CEO	Chief Executive Office
CFS	Container Freight Station
CO	Consumer Oriented
CR	Vietnam Riel
DWT	Dead Weight Tons
EDI	Electronic Data Interchange
EMP	Emerging Markets Program
EPS	Expanded
FAS	Foreign Agricultural Service
FOB	Free on Board
GAIN	Global Agricultural Information Network
GBI	Global Broad-based Initiative
GCCA	Global Cold Chain Alliance
GDP	Gross Domestic Product
GE	Genetically Engineered
GOC	Government of Vietnam
GSO	General Statistics Office
GST	Goods and Service Tax
HACCP	Hazard Analysis of Critical Control Point
HCMC	Ho Chi Minh City
HFC	Hydrofluorocarbon
HORECA	Hotel, Restaurant, and Catering
HRI	Hotel, Restaurant, and Institutional
IARW	International Association of Refrigerated Warehouses
ICD	Inland Container Depots
IAR	International Institute of Ammonia Refrigeration
IQF	Individual Quick Freeze
ISO	International Organization for Standardization
KM	Kilometer
KPI	Key Performance Indicator
KWH	Kilowatt Hour
LCL	Less Than Container Load
LNG	Liquid Natural Gas
LSP	Logistics Service Providers
MARD	Ministry of Agriculture and Rural Development
(M)MT	(Million) Metric Tons
MOH	Ministry of Health
MOIT	Ministry of Industry and Trade



MPI	Ministry of Planning and Investment
MY	Market Year
NAFIQAD	National Agro-Forestry-Fisheries Quality Assurance Department
PC	Phytosanitary Certificate
PIR	Polyisocyanurate
PLC	Programmable Logic Controller
PPP	Public Private Partnership
PRW	Public Refrigerated Warehouse
PUR	Polyurethane
SCM	Supply Chain Management
SOPs	Standard Operating Procedures
SPS	Sanitary and Phytosanitary Standards
SWOT	Strengths, Weaknesses, Opportunities and Threats
TEU	Twenty-Foot Equivalent Unit
US	United States
USDA	United States Department of Agriculture
VASEP	Vietnam Association of Seafood Exporters and Producers
VATA	Vietnam Automobile Transportation Association
VMU	Vehicle Mounted Units
WFLO	World Food Logistics Organization
WMS	Warehouse Management System
XPS	Extruded

EXECUTIVE SUMMARY

The World Food Logistics Organization (WFLO), the technical assistance, training, and education arm of the Global Cold Chain Alliance (GCCA), was allocated a grant under the Foreign Agricultural Service's (FAS) Emerging Markets Program (EMP) Agreement #2019-15 to assess Vietnam's cold chain infrastructure, to identify the characteristics, constraints, and gaps in the existing cold chain system that are unique to Vietnam in Hoi Chi Minh City, Hanoi and surrounding regions.

The assessment took place on February 2020 with in-country travel from February 6-21. The team studied the movement of perishable food products inland from ports to the ultimate consumer and from points of domestic production. It should be noted that the Association of Southeast Asian Nations (ASEAN) studied the cold chain in Vietnam and published a comprehensive chapter on their findings¹. The key observations, conclusions, opportunities, and recommendations summarized in the table below validate their findings, but the recommendations are centered on resource development and training as a path forward for additional phases under this agreement.

Overall, Vietnam has immense potential for investment with cold chain developments led by the seafood sector. Demand is generated by the emerging hotels, restaurants, and catering institutions (HORECA) with a growing high- and middle-income consumer population. Within Southeast Asia, the country is a recognized leader relative to many of its neighbors although opportunities exist to strengthen and support cold chain development.

Observations	Conclusions & Opportunities	Recommendations
Food & Agricultural Market		
US food and agricultural export growth to Vietnam over the past five years has been very strong such that it is now the 6th largest market for the US	Best opportunities are for fresh fruit, poultry, dairy products, beef, processed vegetables, and pork. To a lesser extent, fish, processed fruit (raisins and prunes), and wine present good opportunities.	Target modern supermarkets, hotels, restaurants, and their distributors/suppliers to train them on proper handling, storage and transportation of meat, poultry, dairy products, and fresh fruit.
Growing tourism, strong and growing economy, and expanding middle class is driving growth in modern retail market, food service and hotel sectors and increased demand for safe and premium quality food. Relatively young population with more people moving to urban areas for higher paying	Demand for more imported high-quality and safe food will continue and will be distributed through the modern supermarket, food service, and hotel sectors. US reputation for premium quality and safe food gives the US an important strength and opportunity.	Educate modern retail store and restaurant managers about the value and profitability of handling and displaying perishable foods and the importance of the cold chain to increasing food shelf life, quality, and safety. Educate importers of high value packaged products about opportunities for importing small volumes of these products in mixed or consolidated containers to

¹ Khoi, D.K., T. K. Dung, D. K. Son, D. H. Thiep and P. D. Think (2019), 'Overview of the Cold Chain for Agriculture in Viet Nam', in Kusano, E.(ed.), *The Cold Chain for Agri-food Products in ASEAN*. ERIA Research Project Report FY2018no.11, Jakarta: ERIA, pp.62-100.

jobs bode well for continued growth in demand for packaged convenience foods and delivery.		decrease shipping costs versus importing in LCLs.
Fish and seafood is a win-win for cold chain investment. Vietnam is a fish and seafood exporter to the US and to the world and a good market for US fish products.	Improved cold chain infrastructure and services will be driven by the need for both exporting and importing fish and seafood.	Educate and train third party logistics (3PL) investors, owners, managers, and operators about opportunities and profitability for optimizing their facilities for storage and handling of temperature-controlled products that are both exported from Vietnam as well as imported into the country. Use fish as key commodity during training.
Postharvest		
Farms are small and fragmented. Farmers often harvest at immature stages due to unreliable or nonexistent transport and storage. There is a large need for cold chain to be introduced at postharvest.	No/low-cost practices and technologies could have an impact on extending shelf life down the chain.	While not a focus for this project, communication about the importance of commodity storage and precooling at harvest should be made available to other donors and projects working on-farm.
Processing		
Vietnam imports seafood for processing and re-export creating more demand for cold services.	This is a growing industry for a high value product with potential to drive additional demand for cold storage.	Cold chain training should include seafood as one of the targeted commodities.
Transportation		
There is very limited cold storage capacity at the Ports.	Cold storage limitations represent an opportunity for investment although human capacity to handle materials will be limited.	As cold storage investment occurs at the ports, workers should be trained on cold chain. GCCA should work with local associations to support providing this type of training in Vietnamese.
Refrigerated air freight and rail do not make up a substantial portion of trade.	Air and rail do not represent a strong opportunity at this time.	GCCA should focus on refrigerated trucking and ports.
Freight brokerage services are not consolidated and there is limited use of technology which could improve efficiency.	The introduction of low-cost equipment could improve efficiency.	In addition to training on sanitary transportation practices, GCCA should look for opportunities to introduce modern technologies.
Cold Storage Warehouse Operations		
The industry operates at different levels with a small number of sophisticated facilities offering cold chain services for higher end clients.	The emergence and success of sophisticated 3PLs typically indicates a trend toward greater professional of cold chain	GCCA should include warehouse operations training and resources in subsequent project phases. Local language where possible is critical.

but they are concentrated in the South.	services. Training is much needed.	
Retail/Last Mile		
Little knowledge on handling and storage requirements at the retail level, but it is better than other links in the cold chain.	Retailers are well-placed to push for better cold chain conditions in Vietnam.	There is some opportunity for training on commodity storage, but retailers should also be included in the networking and study tours to educate them on the benefits of a full integrated cold chain.
Government Regulations		
Several ministries and government agencies touch upon the cold chain, and several acts have been promulgated recently.	The government is very interested to support cold chain for economic growth.	Government officials should be encouraged to interact with and learn from the private sector. GCCA should invite them to cold chain networking and training sessions to further their education.
Associations		
Several associations exist, but none are dedicated to cold chain.	There is a willingness from existing associations to provide cold chain training and resources.	GCCA should explore a partnership with appropriate local associations for cold chain training and resources.



INTRODUCTION

OBJECTIVES

The World Food Logistics Organization (WFLO), the technical assistance, training, and education arm of the Global Cold Chain Alliance (GCCA), was allocated a grant under the Foreign Agricultural Service's (FAS) Emerging Markets Program (EMP) Agreement #2019-15 to conduct a cold chain assessment and follow-on technical assistance activities in Vietnam. This baseline assessment examines the existing cold chain practices in Vietnam, with specific focus on identifying gaps and constraints as temperature-controlled products arrive at ports and are then distributed for retail. This study focused on the Hoh Chi Minh City (HCMC) and Hanoi corridor. Upon approval, WFLO will return to Southeast Asia for additional technical training and strategy workshops.

METHODOLOGY

The assessment was conducted in three phases:


- **Literature Review.** Led by the WFLO home office, this included research on all available public information for the food and agriculture industry focused on temperature-controlled food and the development of cold chain systems in Vietnam.
- **In-Country Assessment.** The team visited retailers, importers, distribution/logistics centers, wholesalers and wholesale markets, government officials, cold storage owners, logistics providers, shipping companies and cargo/freight services in Hoh Chi Minh and Hanoi involved with temperature-control enterprises.
- **Analysis and Evaluation.** The team compared existing practices to international standards and market requirements for temperature-controlled food products to identify the specific needs for strengthening the cold chain in Vietnam. The team utilized a Strategic Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis for this assessment.

ASSESSMENT TEAM & QUALIFICATIONS

The assessment team consisted of four international experts with substantial logistics support from the GCCA headquarters office and the United Base Company in Vietnam.

Kent Sisson is a retired United States Department of Agriculture (USDA) Foreign Agricultural Specialist with a background in the marketing of agricultural products. For 37 years, Mr. Sisson has participated in USDA programs designed to increase US exports of agricultural products, maintaining close contact with a variety of cooperator groups, including those supporting this assessment. He has conducted similar assessments in Cambodia, Pakistan, China, Indonesia, the Philippines, Angola, and India and served as the Marketing Specialist.

Manuel Cabrera-Cabana has worked for over 30 years in the perishable logistics sector and previously with the banking industry on project and export financing. Manuel is General Manager & Director of Friopuerto Investment, Cold Storage Division. He holds various Board positions in national and international industry organizations and is Vice Chair of the International Association of Refrigerated Warehouses (IARW) within the Global Cold Chain Alliance (GCCA).



Wes Jayne is the Associate Manager IT Integration at Hall’s Fast Motor Freight Inc and Hall’s Logistics Group. Wes works to define and implement strategies for integrating system environments with new and existing customers; collaborates with team members, end users, and other stakeholders to implement systems and ensures integration, consistency, and access to data. He is a third-generation warehouse operator and has served as past Chairman of the North Atlantic chapter of the International Association of Refrigerated Warehouses (IARW).

Jason Troendle is the Director for Market Intelligence and Research at the Global Cold Chain Alliance (GCCA) and serves to help capture and share market intelligence dedicated to solving our members business challenges. Jason leads GCCA’s efforts on surveying, analysis and reporting of market data including industry benchmarking, growth, and key trends. He also assists with inquiries from members, stakeholders and the public along with completing custom research projects.

The team was supported in-country by **Francis Lee** and his team from the **United Base Company Limited** with additional technical support and guidance from GCCA’s Senior Director of International Projects, **Amanda Brondy**.

ASSESSMENT ROADMAP

The premise of this study is that a lack of sufficient cold chain capacity hinders the export of US temperature-controlled products. In other words, lack of sufficient cold chain is a barrier to the trade of US perishable products. This report contains a USDA market assessment and a cold chain assessment. The market assessment provides the specific information listed in the FAS Assessment Guidance including food and rural business systems, sources of competition, historical value and volume trade data, and trade barriers. The cold chain trade barrier is assessed in its own section.

The market and cold chain assessments are followed by the Strategic SWOT Analysis, market opportunities, and recommendations.

GENERAL ECONOMIC OVERVIEW

Based on World Bank data, Vietnam was the 46th largest economy in the world based on its Gross Domestic Product (GDP) of just over \$262 billion (current US\$) in 2019. It has remained one of the fastest growing economies in Asia with GDP growth reaching 7 percent in 2019. However, with the negative impact of COVID-19 pandemic, the World Bank predicts GDP to decline to 2.8 percent in 2020.

The following graphs and tables provide a recent overview of the macroeconomic situation in Vietnam. Most of the following data and charts was sourced from the [Trading Economics](#) website.

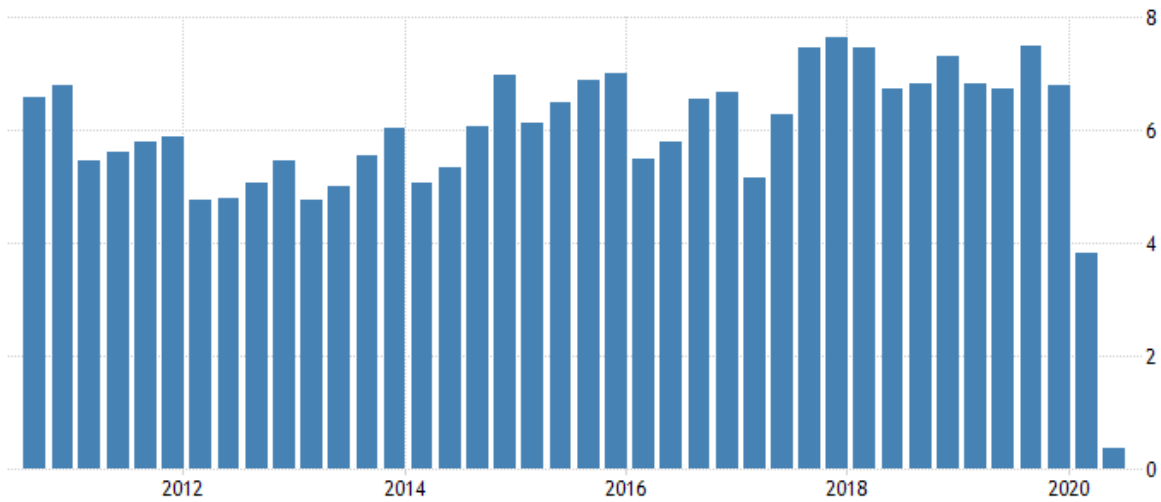
VIETNAM GDP ANNUAL GROWTH RATE²

GDP Annual Growth Rate in Vietnam averaged 6.43 percent from 2000 until 2020, reaching an all-time high of 8.48 percent in the fourth quarter of 2007 and a record low of 0.36 percent in the second quarter of

² Tradingeconomics.com

2020. The low GDP growth of 0.36 percent year-on-year was following a 3.83 percent growth in the previous period and was the slowest GDP growth rate since the series began in 2000, hampered by the coronavirus pandemic and weaker global demand. In the first half of this year, the economy advanced 1.91 percent from a year earlier.

Figure 1. Vietnam GDP Annual Economic Growth Rate



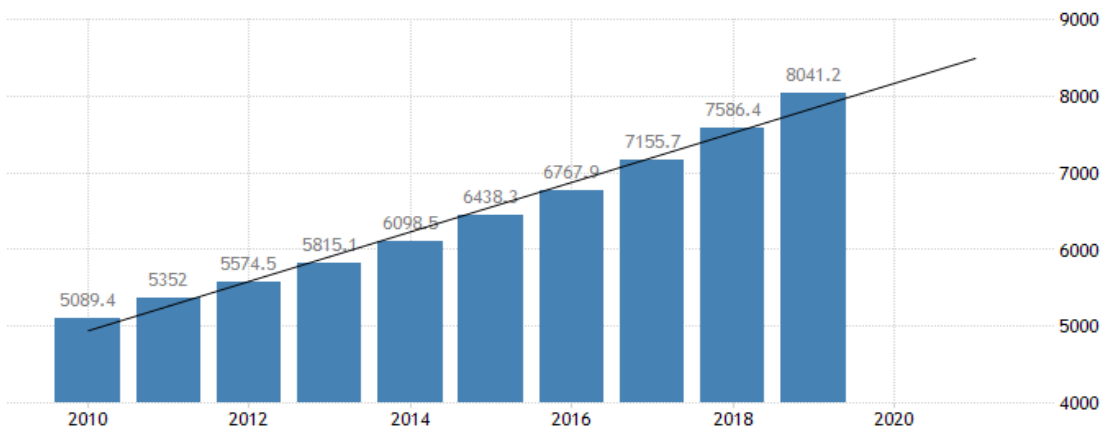
SOURCE: TRADINGECONOMICS.COM | GENERAL STATISTICS OFFICE OF VIETNAM

Source: <https://tradingeconomics.com/Vietnam/gdp-growth-annual> as reported by the General Statistics Office of Vietnam.

VIETNAM GDP ANNUAL PER CAPITA GDP ON A PPP BASIS

The Gross Domestic Product (GDP) per capita in Vietnam was last recorded at 8,041.20 USD in 2019, when adjusted by purchasing power parity (PPP). This is equivalent to 45 percent of the world's average. GDP per capita PPP in Vietnam has grown steadily over the past 10 years from a low of 5,089 USD in 2010 to the 2019 high of 8,041, reflecting an increase of 58 percent.

Figure 2. Annual Per Capita GDP (PPP basis)



SOURCE: TRADINGECONOMICS.COM | WORLD BANK

Within Southeast Asia, Vietnam ranks 8th in terms of GDP on a PPP basis slightly below Laos and just above Myanmar and Cambodia.

Table 2. Southeast Asian Population and GDP Data by Country

Rank	Country	Population in million	GDP Nominal Millions of USD	GDP Nominal per capita USD	GDP (PPP) millions of USD	GDP (PPP) per capita USD
1	Singapore	5.670	362,818	63,987	585,055	103,181
2	Brunei	0.447	12,455	27,871	35,920	80,383
3	Malaysia	32.801	365,303	11,136	1,078,537	32,880
4	Thailand	67.913	529,177	7,791	1,383,022	20,364
5	Indonesia	266.998	1,111,713	4,163	3,737,484	13,998
—	ASEAN	654.306	3,111,768	4,755	9,106,637	13,918
6	Philippines	108.307	356,814	3,294	1,025,758	9,470
7	Laos	7.163	19,127	2,670	58,091	8,109
8	Vietnam	95.494	261,637	2,739	770,227	8,065
9	Myanmar	53.019	65,994	1,244	355,609	6,707
10	Cambodia	16.494	26,730	1,620	76,934	4,664

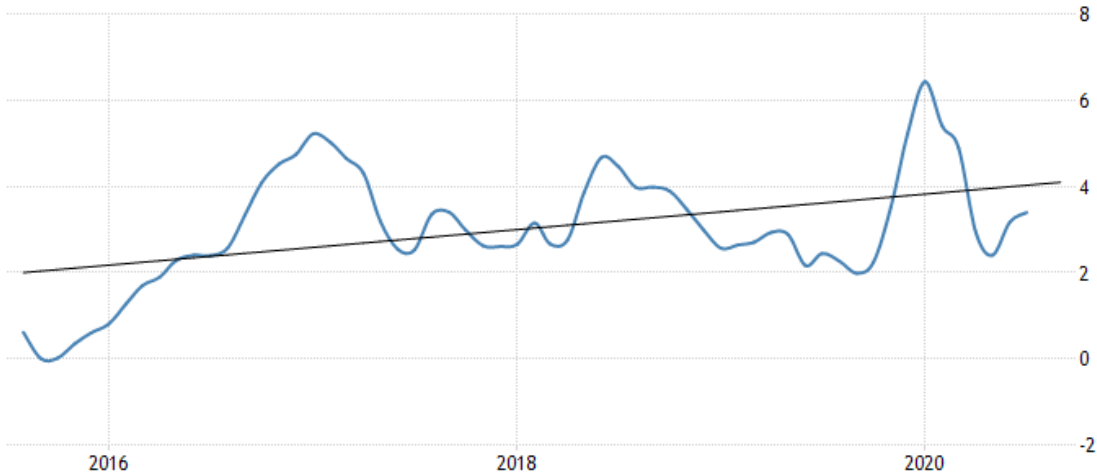
Source: International Monetary Fund, 2019

VIETNAM INFLATION RATE

The annual inflation rate in Vietnam increased to 3.39 percent in July of 2020 from 3.17 percent in the previous month. This was the highest inflation rate since March, mainly due to a rise in both housing and gasoline prices. Prices rose faster mostly for housing and construction materials (0.66 percent vs 0.16 percent in June), attributed to the increase in electricity and water prices, while food and catering services prices continued to rise (11.89 percent vs 15.86 percent in June). In addition, transport prices fell much less (-14.04 percent vs -17.30 percent) as a result of increasing gasoline prices.

Historically the inflation rate in Vietnam averaged 6.17 percent from 1996 until 2020, reaching an all-time high of 28.24 percent in August of 2008 and a record low of -2.60 percent in July of 2000.

Figure 3. Vietnam Inflation Rate



SOURCE: TRADINGECONOMICS.COM | GENERAL STATISTICS OFFICE OF VIETNAM

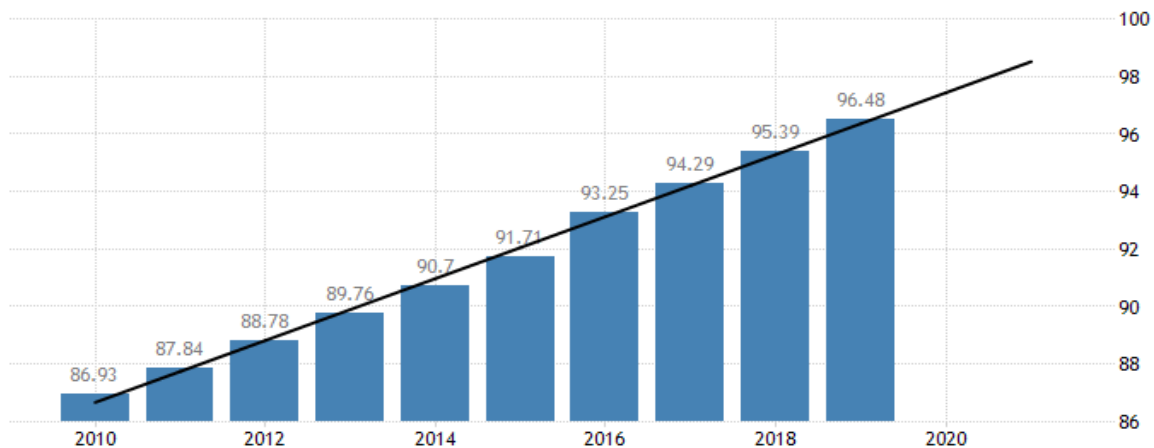
Source: <http://www.tradingeconomics.com/Vietnam/inflation-cpi> as reported by the General Statistics Office of Vietnam.

POPULATION

The total population in Vietnam was estimated at 96.5 million people in 2019, according to the latest census figures. Looking back, in the year of 1960, Vietnam had a population of 34.7 million people, so over the last 60 years the population has nearly tripled. Looking ahead, the Vietnam population is projected to trend around 99.70 million in 2020, according to Trading Economics econometric models.

The population of Vietnam represents 1.27 percent of the world's total population and is the third most populous country in Southeast Asia after Indonesia (266 million) and the Philippines (109 million).

Figure 4. Population Growth



SOURCE: TRADINGECONOMICS.COM | GENERAL STATISTICS OFFICE OF VIETNAM

Source: <https://tradingeconomics.com/Vietnam/population> as reported by the General Statistics Office of Vietnam.

Today, 70 percent of the population is under 35 years of age, with a life expectancy of 76 years, the highest among countries in the region at similar income levels. An emerging middle class, currently accounting for 13 percent of the population, is expected to reach 26 percent by 2026. As of 2018, 35 percent of the population lived in urban areas, and the number continues to increase by about 3 percent per year. The middle class is also expected to grow to about 26 percent by 2026.³

EXCHANGE RATE

Historically, the Vietnamese Dong reached an all-time high of 23,650 per US dollar in March of 2020. Since the last quarter of 2015, the value of the US dollar has strengthened slightly from a low of around 21,750 Dong per dollar. Looking forward, Trading Economics estimates the Dong/US dollar exchange rate to stay relatively stable over the next 12 months through July 2021.

**Figure 5. Exchange Rate Between Vietnamese Dong and US Dollar
(Dong per \$1 US Dollar)**



Source: <https://tradingeconomics.com/Vietnam/currency>

UNEMPLOYMENT RATE

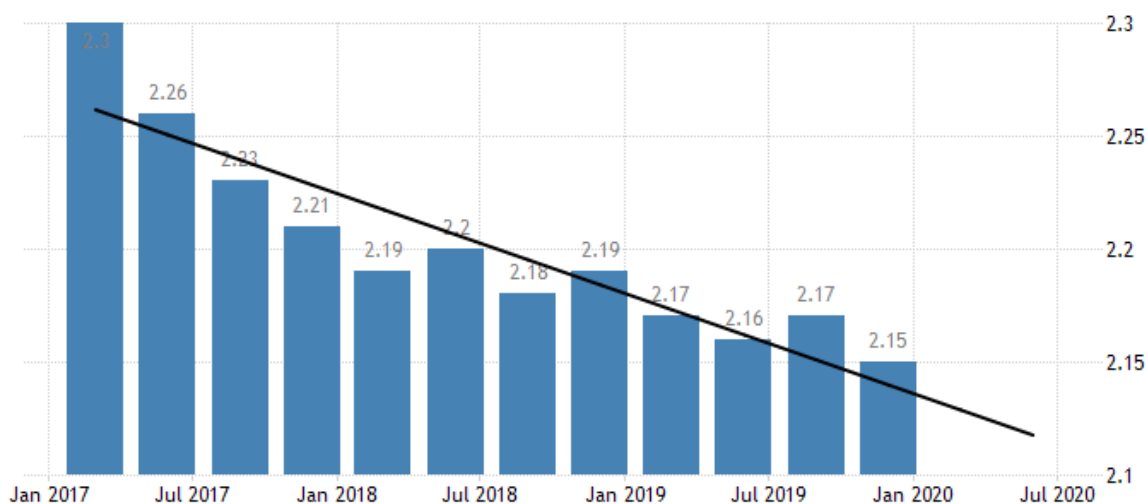
The unemployment rate in Vietnam averaged 2.33 percent from 1998 until 2019, reaching an all-time high of 4.50 percent in the fourth quarter of 1998 and a record low of 1.81 percent in the fourth quarter of 2012.

In 2019, the unemployment rate decreased to 2.15 percent in the fourth quarter of 2019 from 2.17 percent in the third quarter of 2019.

³ <https://www2.deloitte.com/content/dam/Deloitte/sg/Documents/consumer-business/sea-cb-vietnam-consumer-survey-2020.pdf>

Looking forward, Trading Economics estimates the unemployment rate in Vietnam to stand at 2.40 at the end of 2020.

Figure 6. Vietnam Unemployment Rate



SOURCE: TRADINGECONOMICS.COM | GENERAL STATISTICS OFFICE OF VIETNAM

Source: <https://tradingeconomics.com/Vietnam/unemployment-rate> as reported by General Statistics Office of Vietnam

EASE OF DOING BUSINESS IN VIETNAM

With a score of 70, Vietnam ranks in the upper middle third of all 190 countries in terms of the ease of doing business. Compared to other Southeast Asian nations where WFLO has or will conduct cold chain assessments, it ranks higher than Indonesia, Philippines, and well above Cambodia. However, it is substantially lower than the more developed countries of Singapore and Thailand. Among the business categories that are more relevant to investing or building cold storage facilities, Vietnam ranks very high in Dealing with Construction Permits. In fact, it ranks higher than all the other Southeast Asian countries except for Singapore in that category and in Registering Property. It also ranks high in terms of Getting Electricity – even higher than the US

Table 3. Ease of Doing Business World Bank Rankings for Vietnam with Comparisons (Among 190 World Economies)

Category	Thailand	Vietnam	Indonesia	Philippines	Cambodia	United States	Singapore
Ease of Doing Business	21	70	73	95	144	6	2
Starting a Business	47	115	140	171	187	55	4
Dealing with Construction Permits	34	25	110	85	178	24	5
Getting Electricity	6	27	33	32	146	64	19
Registering Property	67	64	106	120	129	39	21
Getting Credit	48	25	48	132	25	4	37
Protecting Minority Investors	3	97	37	72	128	36	3

Paying Taxes	68	109	81	95	138	25	7
Trading Across Borders	62	104	116	113	118	39	47
Enforcing Contracts	37	68	139	152	182	17	1
Resolving Insolvency	24	122	38	65	82	2	27

Source: The World Bank, *Ease of Doing Business Rankings*, 2020.

FOOD & AGRICULTURE MARKET ASSESSMENT ⁴

This section summarizes the food and agriculture production, distribution and consumption, trade, and competition in Vietnam. The consumer-oriented, temperature-controlled products of greatest interest to the US for this study are poultry, beef, pork, dairy products, frozen potato products, fresh fruit, and seafood.

PRODUCTION OF FOOD AND AGRICULTURE PRODUCTS

Vietnam's total manufacture of food and beverages in 2019 was just under US \$70 billion. The food and beverage manufacturing industry in Vietnam had just over 10,000 enterprises in 2017 with more than 597,000 employees. The turnover was US \$55 billion and accounted for 15.6 percent of total revenue for the total manufacturing sector in the country.

Food and beverage processing in Vietnam has shown strong growth from 2014 to 2018 (see table below). Both the young population and growing middle class are driving the strong demand in the food and beverage sector.

Table 4. Vietnam's Production of Main Industrial Food Products and Food Ingredients

Main industrial food products	2014	2015	2016	2017	2018
Food					
Milled rice (thousand tons)	41,017	40,773	38,991	39,504	41,743
Frozen aquatic products (thousand tons)	1,587	1,666	1,978	1,974	2,133
Refined sugar (thousand tons)	1,863	1,842	1,654	1,719	1,927
Refined vegetable oils (thousand tons)	863	966	1,114	1,081	1,166
Sodium Glutamate (thousand tons)	253	263	278	280	186
Processed tea (thousand tons)	180	168	164	170	169
Powdered milk (thousand tons)	90	99	107	112	121
Canned aquatic products (thousand tons)	104	100	101	105.1	109.2
Roast, ground, and instant coffee (thousand tons)	91	88	94	100	107
Canned vegetables (thousand tons)	63	65	69	74	79
Canned fruits and nuts (thousand tons)	48	49	52	56.2	56.9
Canned meat (thousand tons)	5	4	4	4.1	3.9
Beverages/Liquids					
Beer (million liters)	3,287	3,526	3,835	4,005	4,214
Fresh milk (million liters)	847	1,028	1,106	1,211	1,258

⁴ The source for much of this information is from USDA Foreign Agricultural Service (FAS) GAIN reports that are submitted by the FAS officers based in Vietnam.

Fish sauce (million liters)	334	340	368	373.7	374.2
Liquor (million liters)	318	313	305	310	316

Source: General Statistics Office (GSO)/Ministry of Planning and Investment (MPI), Ministry of Industry and Trade (MOIT) and Ministry of Agriculture and Rural Development (MARD)

DISTRIBUTION AND CONSUMPTION OF FOOD

Vietnam’s cold chain market has grown rapidly in recent years to reach an estimated market size of US \$169 million⁵. The volumes of perishable foods consumed are substantial and growing fast, led by meat, fruit and vegetables, and fish.

Food Distribution Channels

The major food distribution channels in Vietnam include retail, food service, and e-commerce sectors. The dominant channels for food distribution in the retail sector are the traditional wet market and smaller grocery or “Mom and Pop” stores. Of the US \$51 billion in total food and beverage retail sales, the estimated sales revenue generated by those traditional retailers in 2019 was \$44 billion accounting for 86 percent of total grocery retail sales. Modern retail stores accounted for the remaining approximate 14 percent.

The continued dominance in traditional grocery concentration at retail can be attributed to factors such as proximity to residential areas, competitive prices, diverse products in one marketplace, flexibility in dealing with customers, and gradual improvements in product handling. Despite this growth, concerns with hygiene and food safety remain due to the infrastructure constraints of traditional and wet markets. Vietnamese consumers rate food safety as their number one social concern although many lack trust in the local food safety.⁶⁷ Consumers also prefer warm fresh meat to frozen meat, but some consumers are driving the demand as they welcome frozen meat for consumption. However, there is a growing perception that modern retail outlets are cleaner and safer than wet markets signaling potential for growth in the modern retail sector. The COVID-19 pandemic may increase desire for such outlets.

Retail Sector ⁸

According to the Vietnam General Statistics Office (GSO) as reported by FAS Vietnam, total 2019 food and beverage retail sales were estimated at \$51 billion, a 13 percent increase over the previous year and accounted for 31 percent of total retail sales of goods and 23 percent of retail sales of goods and services.

However, despite this expansion, three grocery store chains exited the Vietnam market, including Vingroup, Vietnam’s largest grocery retailer, due to intense competition. In 2020, the COVID-19 outbreak hit the retail food sector in the short term but has offered expanded opportunities for e-commerce to grow.

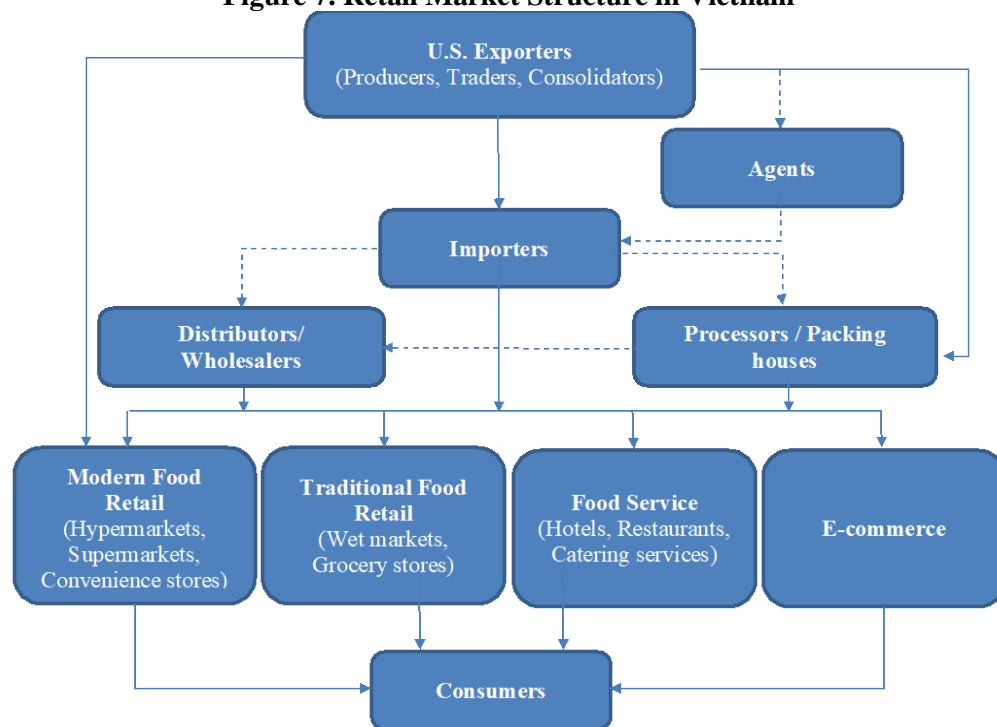
⁵ World Bank Group *Vietnam Development Report 2019*.

⁶ Khoi, D.K., T. K. Dung, D. K. Son, D. H. Thiepan and P. D. Think (2019), “Overview of the Cold Chain for Agriculture in Viet Nam,” in Kusano, E. (ed.), *The Cold Chain for Agri-food Products in ASEAN*. ERIA Research Project Report FY2018no.11, Jakarta: ERIA, pp.62-100.

⁷ In spite of this, in Hanoi, more than 90 percent of consumer spending on fruits, vegetables, meats, and eggs still occurs in traditional outlets (wet markets).

⁸ The majority of information for this section of the report is sourced from: [USDA/FAS GAIN Report VM2020-0069, “Retail Foods”, July 8, 2020](#)

Figure 7. Retail Market Structure in Vietnam



Source: [USDA/FAS GAIN Report VM2020-0069, “Retail Foods”, July 8, 2020](#)

Although the vast majority of food is still distributed through the traditional markets, modern retail chains and convenience stores are expanding and are making up an increasing share of distribution in response to growing consumer demand. The table below shows the major modern retail chains and convenience stores that can be found in most medium- to large-sized cities throughout Vietnam.

Table 5. Major Modern Retail Chains in Vietnam (includes # of stores in 2018, where indicated)

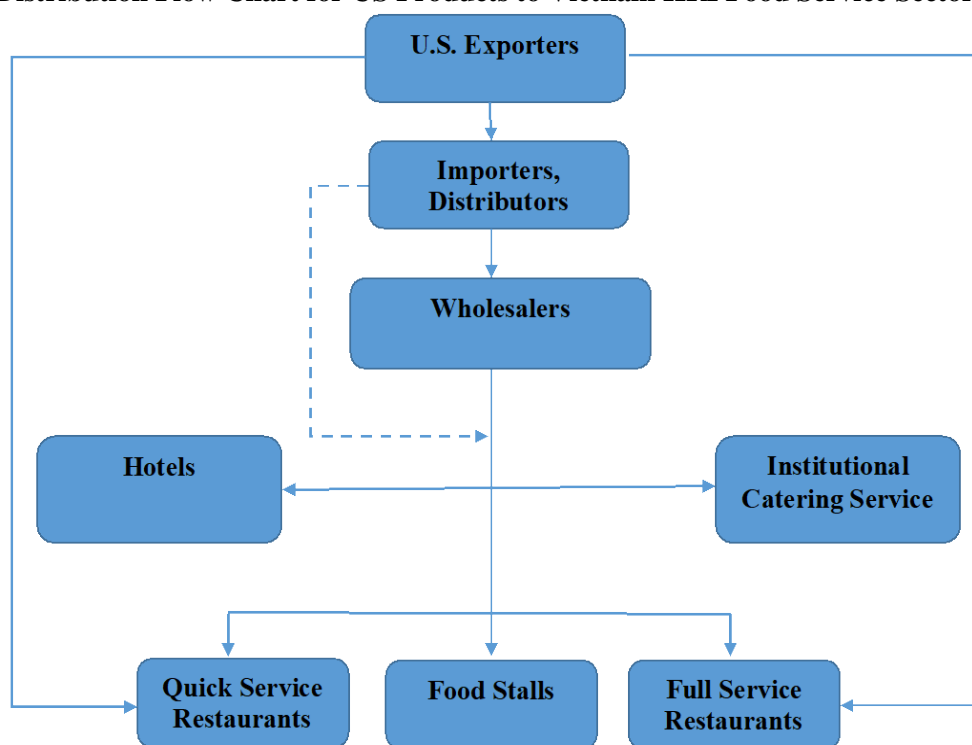
Hyper/Supermarkets		Convenience Stores	
Aeon Mega Market (www.aeon.com/vn)	(6)	7-Eleven (www.7-eleven.vn)	
Aeon Citimart (www.aeonicitimart.vn)	(29)	B’s Mart (www.bsmartvina.com)	
Big C (www.bigc.vn)	(35)	Bach Hoa Xanh (www.bachhoaxanh.com)	
Co-op Mart (www.co-opmart.com.vn)	(96)	Cheers	
Co-op Extra (http://coopxtra.net)		Circle K (www.circleK.com.vn)	
E-Mart (www.emart.com.vn)		Co-op Food (www.co-opmart.com.vn)	
Hapromart (www.haprogroup.vn)		Co-op Smile (www.co-opmart.com.vn)	
K-Mart	(60)	Family Mart (www.famima.vn)	
Lottmart (http://lottmart.com.vn)	(14)	GS 25 (http://gs25.com.vn)	
MM Mega Market (http://mmvietnam.com)	(19)	Ministop (www.ministop.vn)	
Nam An Market (https://namanmarket.com/)		Q-Mart (https://qmart.com.vn)	
Q Mart (https://qmart.com.vn)			
Vinmart (https://vinmart.com/)			
BRG (https://brggroup.vn)			

Source: [USDA/FAS GAIN Report VM2020-0069, “Retail Foods, July 8, 2020](#)

Food Service Sector⁹

The hotel, restaurant, and institutional (HRI) food service sector growth has kept pace with the country's economic growth over the last three to four years. The HRI food service sector is driven by diverse economic and cultural factors, including strong economic growth, increasing tourism, a growing middle class with higher income per capita, rapid urbanization, increasing global economic integration, and higher awareness of food safety have all contributed to strong growth in the Vietnamese HRI food service sector, making it an attractive market for US consumer-oriented food and agricultural products. The usual international quick service restaurants can be found throughout Vietnam along with more up-scale family style restaurants that serve Asian and Western food and cater to middle class consumers. The figure below depicts the typical distribution flow of imported food products from the United States into the Vietnamese food service sector.

Figure 8. Distribution Flow Chart for US Products to Vietnam HRI Food Service Sector

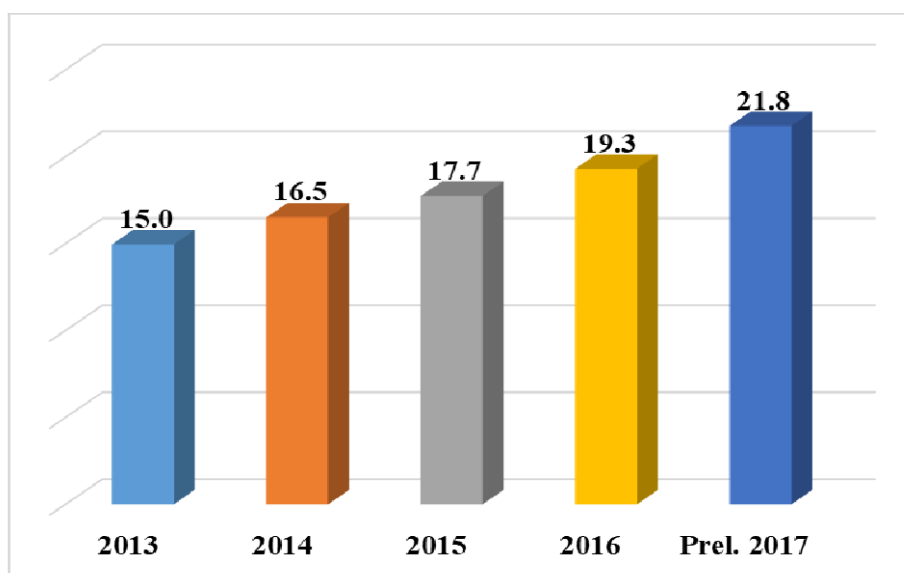


Source: [USDA/FAS GAIN Report VM9005, "Food Service", July 24, 2019](#)

Based on the latest data available, FAS Vietnam calculated that the compound average growth rate (CAGR) of the accommodation, food, and beverage service sector increased 12 percent from 2013 to 2017 (see figure below).

Figure 9. Revenue of Accommodation, Food, and Beverage Service (value in billion USD)

⁹ Source: The majority of information for this section of the report is sourced from: [USDA/FAS GAIN Report VM9005, "Food Service", July 24, 2019](#)



Source: [USDA/FAS GAIN Report VM9005, "Food Service", July 24, 2019](#)

Note: Represents FAS office calculations based on Vietnam General Statistic Office's data and Vietcombank exchange rate.

E-Commerce

FAS reports that the e-commerce sector saw healthy growth in 2019 however, some major players exited due to tough competition. Robins.vn, an e-commerce platform belonging to Central Group Vietnam, which owns the Big C supermarket chain with 35 outlets across the country, closed in March 2019 after two years of operation. Lotte.vn, the e-commerce arm of Lotte Vietnam, shut down September 2019 due to low traffic and tough competition.


Although retailers have expanded in Vietnam in recent years, underdeveloped distribution networks struggle to provide a safe and efficient last mile distribution service. E-commerce is beginning to be offered with some retailers offering fresh foods and home-delivery services using motorbikes attached with insulation boxes to control the temperature. However, this solution has appeared ineffective on hot days. Despite the fact that there is greater demand for food delivery and convenience, there remains little e-commerce for food and no large Amazon-equivalent company in Vietnam. This may change as the country recovers from the Covid-19 pandemic.

Food Distribution Infrastructure

The food distribution infrastructure from the production (domestic) areas and ports (imported) to the final consumer faces many challenges. This is discussed in greater detail in the storage, transportation, and handling sections of this report. Thus, only the main points are highlighted here.

The assessment team did not focus its investigation on the cold chain for domestically produced food and agricultural products since our over-riding objective was to identify areas where cold chain challenges and opportunities will enhance and facilitate imports of US origin products.

With regard to imports of temperature-controlled food and agricultural products, the main cold chain challenges are found in the "last mile" of the chain, that is, primarily from the distribution and storage centers to the retail and HRI outlets. Typically, from the ports to the large, modern storage facilities the



cold chain is kept intact for the most part. There are some issues with the seaports being unable to handle the larger container ships. Thus, US products must be off-loaded onto smaller feeder vessels in other Asia ports (e.g., in Hong Kong, Korea, Taiwan or Singapore) before they are delivered to Vietnam. However, this only adds a few days to the overall delivery time and the containers are kept at the appropriate temperature. Upon arrival at Vietnam ports, the containers typically are cleared and transported to the cold storage without much problem.

Once the containers are opened and unloaded at the storage facilities, the cold chain challenges may or may not begin, depending on the design of the facilities and/or efficiency and effectiveness of the cold storage operations. We found a wide range of facilities and operations during our visits – from state of the art fully automated facilities and operations to very old and poorly designed facilities that were not being well maintained or operated. In both the Ho Chi Minh City and Hanoi metro areas, there are some very large and relatively new industrial areas with excellent roads, security and operations that are very comparable to the US or Europe. In other cases, facilities were located down narrow and poorly maintained roads in random locations in the cities that made it difficult if not impossible for large trucks to come to load and unload.

TRADE

Vietnam's Agricultural and Related Products Trade with the World

In 2018, Vietnam's imports of all agricultural and related products from all sources were estimated at US \$34.5 billion based on Trade Data Monitor data used in FAS reporting. That year, US exports of ag and related products to Vietnam hit a record high of just under US \$4.5 billion (see table below) and although exports declined to just under US \$4.0 billion in 2019, Vietnam was the 6th largest market for the US, representing 2.5 percent of total US ag and related product exports that year. In recent years, craft beer has become a large export from US to Vietnam.

Vietnam's imports of consumer-oriented (CO) products (most of which require temperature-controlled handling and storage) from the world were down 12 percent from US \$14.5 billion in 2018 to US \$12.8 billion in 2019. The value of US CO exports remained steady at US \$973 in both years representing a US market share of between 7 to 8 percent. China was the number one exporter of CO products to Vietnam followed by other ASEAN countries as a group, India was number 3, and then the US.

Vietnam's Agricultural and Related Products Trade with the United States

ASEAN in general and Vietnam in particular, are important markets for US ag and related product exports. At the end of 2019, Vietnam was the sixth largest market for total US exports of food and agricultural products just behind Canada, Mexico, China, Japan, and South Korea. Vietnam is the number one market within ASEAN where the US exported US\$14.4 billion, or just over 9 percent of total US ag and related products to the world. In fact, six ASEAN nations ranked within the top 30 markets for total US ag exports in 2019.

Table 6. US Agricultural and Related Product Exports: World and ASEAN (value in 1000 US\$)

January - December Values in Thousands of dollars							
Partner	2015	2016	2017	2018	2019	Jan - May 2019	Jan - May 2020
World Total	150,603,539	152,329,718	157,719,379	159,347,105	153,974,811	63,999,715	62,093,576
Southeast Asia	10,870,442	11,971,718	12,605,312	15,208,245	14,355,331	6,153,915	6,032,340
Vietnam (#6)	2,596,287	3,020,790	2,940,680	4,446,504	3,970,244	1,790,217	1,700,993
Philippines (#10)	2,477,305	2,697,744	2,711,376	3,116,283	3,022,151	1,261,895	1,254,133
Indonesia (#11)	2,258,967	2,753,573	2,960,585	3,177,205	2,932,095	1,293,908	1,290,721
Thailand (#17)	1,818,358	1,678,817	1,959,460	2,238,789	1,942,844	779,289	746,022
Malaysia (#27)	879,949	839,664	966,153	1,111,893	1,187,185	512,306	479,330
Singapore (#30)	753,667	841,710	917,395	920,506	1,047,667	417,642	442,423
Burma	39,501	82,918	70,938	126,975	174,824	65,419	87,871
Cambodia (#94)	40,458	49,713	70,933	62,904	69,734	29,564	26,696
Brunei	4,817	5,803	6,509	4,871	5,441	2,472	2,150
Laos	1,133	986	1,283	2,315	3,146	1,203	2,001

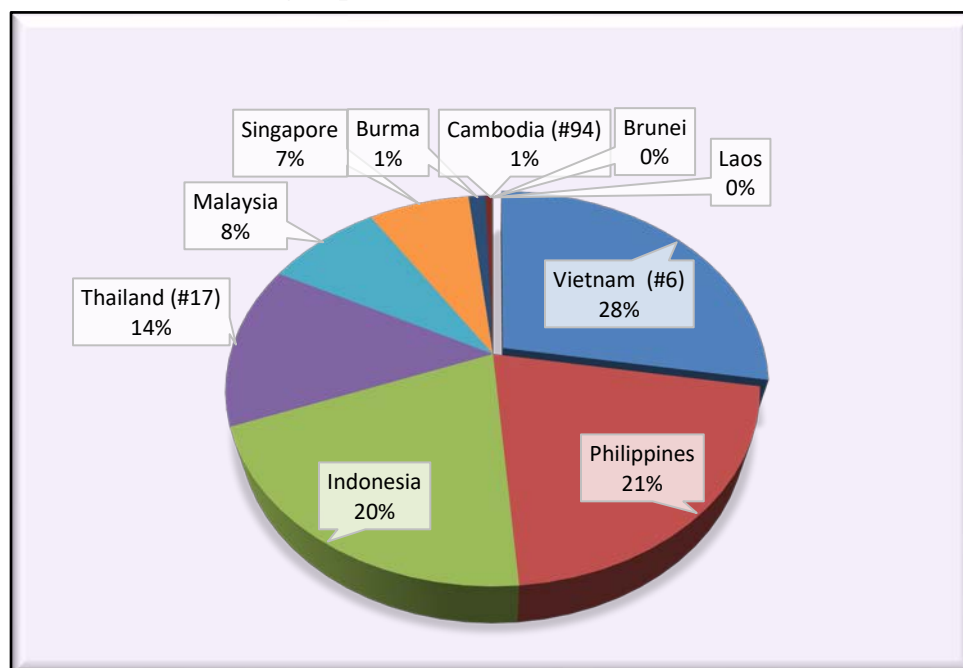
Data Source: US Census Bureau Trade Data

Notes:

1. (*) denotes a country that is a summarization of its component countries.
2. Product Group: BICO-HS6

Within ASEAN, Vietnam took 28 percent of US ag and related product exports in 2019.

Figure 10. Value of US Food & Ag Exports to ASEAN (2019)



Data Source: US Census Bureau Trade Data as presented in FAS's Global Ag Trade Statistics (GATS) data base at <https://apps.fas.usda.gov/gats/default.aspx>.

Based on US export data, the value of US CO exports over the past five years has ranged between 22 to 29 percent of the total export value of US agricultural products to Vietnam (see table, below). In 2019, the top five US consumer-oriented products exported to Vietnam that require temperature control handling included dairy products, poultry meat, fresh fruit, beef and beef products, and processed vegetables (mostly frozen potato products). Export value of those five product categories accounted for over 58 percent of the total export value of US consumer-oriented products to Vietnam in 2019. Fish products (mainly lobster, crabs, shrimp, and salmon) are also a large US export to Vietnam reaching a high of over US \$115 million in 2017 when it was the single largest US ag and related products export to the country that year.

Vietnam's exports grew at an annual average rate of over 14 percent during the past five years, nearly five times faster than the global average. It was the 12th largest supplier of ag related products to the US in 2019 supplying US \$3.9 billion that year which was down from US\$4.2 billion in 2018. Fish products (primarily catfish, shrimp, and tuna) account for the major share of US ag and related imports from the country at over 37 percent in 2019. Tree nuts (cashews) account for the next highest share of US ag imports from Vietnam. Vietnam maintained a positive trade balance in the ag trade sector with the US up until 2018 and 2019.

Table 7. US Agricultural and Related Product Exports to Vietnam by Product (Calendar Year value in 1000 US\$)

Product	2015 Value	2016 Value	2017 Value	2018 Value	2019 Value
Agricultural & Related Products Total	2,596,287	3,020,790	2,940,680	4,446,504	3,970,244
Bulk Agricultural Total	1,000,083	1,354,736	1,404,663	2,229,778	1,832,354
Consumer Oriented Agricultural Total	756,372	805,658	803,653	972,801	972,941
Dairy Products	160,984	113,488	105,116	144,350	169,313
Poultry Meat & Prods. (ex. eggs)	83,600	79,224	76,283	109,722	140,183
Fresh Fruit	58,955	66,933	72,185	102,065	139,061
Food Preps. & Misc. Bev	46,741	52,113	52,205	54,166	122,836
Tree Nuts	272,370	331,299	308,172	287,156	121,155
Beef & Beef Products	31,271	39,690	60,557	81,807	75,947
Non-Alcoholic Bev. (ex. juices, coffee, tea)	38,787	43,972	43,129	50,878	67,529
Chocolate & Cocoa Products	6,703	12,997	18,414	28,395	40,063
Processed Vegetables	6,927	10,501	19,864	32,761	37,614
Pork & Pork Products	3,253	4,758	11,972	33,804	18,417
Processed Fruit	23,457	29,410	16,508	15,900	13,383
Wine & Beer	12,463	9,985	8,787	13,415	9,725
Tea	1,963	1,866	3,574	5,855	7,203
Snack Foods NESOI	3,096	2,323	1,881	2,574	2,425
Meat Products NESOI	1,871	2,445	545	2,406	2,046
Condiments & Sauces	1,699	1,439	1,598	1,480	1,906
Dog & Cat Food	104	218	242	2,806	1,510
Fresh Vegetables	70	185	237	1,006	853
Eggs & Products	285	451	527	606	601
Fruit & Vegetable Juices	788	1,050	879	814	571
Nursery Products & Cut Flowers	298	293	120	124	277
Spices	213	621	703	470	191
Coffee, Roasted and Extracts	475	398	157	240	132
Intermediate Agricultural Total	487,154	495,744	323,507	786,708	673,739
Agricultural Related Product Total	352,678	364,652	408,857	457,216	491,211
Forest Products	221,369	215,592	264,226	311,809	349,419
Fish Products	114,484	102,344	115,422	77,651	74,836
Distilled Spirits	8,722	35,720	25,418	64,787	63,306
Ethanol, incl. bev.	8,103	10,996	3,792	2,970	3,650

Source: US Census Bureau Trade Data

Table 8. US Agricultural and Related Product Imports from Vietnam by Product
(Calendar Year value in 1000 US\$)

Product	2015 Value	2016 Value	2017 Value	2018 Value	2019 Value
Agricultural & Related Products Total	3,265,423	3,664,800	3,937,038	4,179,806	3,869,285
Agricultural Related Product Total	1,422,430	1,511,909	1,534,600	1,854,678	1,883,563
Fish Products	1,335,765	1,414,699	1,394,979	1,572,686	1,451,597
Forest Products	86,539	96,974	139,446	281,904	431,786
Distilled Spirits	125	235	174	88	180
Consumer Oriented Agricultural Total	1,274,499	1,482,242	1,712,760	1,768,667	1,563,146
Tree Nuts	830,454	968,567	1,258,062	1,317,397	1,093,444
Spices	299,076	342,348	261,616	201,183	193,535
Food Preps. & Misc. Bev	46,007	49,476	51,366	59,997	76,118
Processed Fruit	18,013	22,245	21,165	36,493	31,027
Dog & Cat Food	8,900	15,460	19,830	34,934	27,515
Fruit & Vegetable Juices	2,982	4,008	6,273	12,378	22,334
Fresh Fruit	5,606	11,431	17,017	20,585	20,229
Processed Vegetables	14,627	13,922	18,010	15,409	20,068
Coffee, Roasted and Extracts	18,124	19,589	16,881	16,311	19,934
Non-Alcoholic Bev. (ex. juices, coffee, tea)	5,273	8,161	12,038	11,452	13,717
Wine & Beer	618	163	1,309	8,796	10,505
Snack Foods NESOI	4,752	6,397	5,810	7,371	9,404
Condiments & Sauces	6,172	6,922	7,484	6,323	8,242
Tea	10,235	7,704	8,636	8,235	6,932
Meat Products NESOI	572	452	821	8,095	5,874
Nursery Products & Cut Flowers	861	1,979	1,447	1,403	2,311
Chocolate & Cocoa Products	883	1,329	1,246	1,482	1,671
Eggs & Products	0	0	0	73	194
Fresh Vegetables	1,343	2,034	3,749	750	92
Dairy Products	0	55	0	0	0
Bulk Agricultural Total	429,908	560,102	588,214	457,377	333,924
Intermediate Agricultural Total	138,587	110,546	101,464	99,083	88,651

Source: US Census Bureau Trade Data

SOURCES OF COMPETITION


The US faces competition in Vietnam from both domestic and international suppliers of CO products.

Domestic

Local poultry and swine production are the primary competitive products domestically. However, Vietnam does import substantial volumes of both products from the US. Vietnam does not produce much beef or dairy products, so it relies primarily on imports to satisfy that demand. They do produce many fish products and export a large volume of shrimp and catfish to the US and other countries. They also produce and export significant volumes of tropical fresh fruits, vegetables, and cashew nuts.

International

The US faces stiff competition in Vietnam (and other ASEAN countries) from dairy products that are supplied mostly from New Zealand and Australia but also from Europe. Australia and New Zealand are also major competitors in supplying beef. Brazil and Canada are important pork suppliers. China is a major competitor in providing temperate fresh fruit including apples, table grapes, cherries, and pears which



compete directly with the US during the same season of the year. Canada, Chile, and South Africa also supply some fresh fruit including cherries. Australia and New Zealand also compete in fresh fruits, but their harvest seasons are counter cyclical to the US and China.

Trade with bordering neighbors is limited except for products moving across northern borders with China, which has seen growth in recent years. Many traders and exporters at the border with China have installed small chilled cold rooms for fruit and vegetables and frozen rooms for seafood to consolidate freight for storage. These are utilized to hold product while awaiting export license. When the border opens, Chinese companies send 40' refrigerated (reefer) trucks to pick up consolidated freight at the holding warehouse. Only trucks with fresh produce like fruits and vegetables are allowed to come full to offload Chinese products and return back with Vietnamese products. Frozen trucks can only come empty for loading Vietnamese products; no frozen goods come from China. The distance to the northern border is around 300/KM, a 4 to 5 hour drive.

COLD CHAIN ASSESSMENT

POSTHARVEST HANDLING

Farms. One of the major causes of food loss in Vietnam is the fragmentation of its agricultural production into micro-farms. For instance, the average fruit farm in Vietnam is approximately 0.4 hectare (or about 43,000 square feet), more than 400 times smaller than a US fruit farm.

Agricultural Practices. Farmers usually lack reliable and consistent knowledge on postharvest handling practices and lack access to cold storage and reliable transportation and therefore harvest agricultural products when they are immature. The seasonality of agricultural production and abundant supply in short harvesting periods generate unstable flows of products.

Food Loss. Losses are estimated at 8.8 million tons or \$3.9 billion (2 percent of Vietnam GDP, 12 percent of Vietnam Agriculture GDP). Product spoilage is nearly 20 percent at harvest.¹⁰

Pre-cooling. Production and harvest have the largest need for cold storage. Proper postharvest cooling could largely decrease food lost from producers to consumers. Presently, there is a large time gap from initial harvest to storage, leading to greater food loss at consequent stages of postharvest handling. A lack of urgency causes food spoilage.

PROCESSING

Vietnam imports intermediate seafood materials for extra processing and re-exporting to international markets. This is creating more demand for cold services.

¹⁰ <https://www.foodlogistics.com/cold-chain/article/21010074/food-losses-in-vietnam-the-shocking-reality>

REFRIGERATED TRANSPORT

Trade flows are concentrated at twelve of Vietnam's 48 border gates—two airports, five seaports and five border crossing points, which collectively handled 86 percent of total trade value in 2016.¹¹

Refrigerated Rail

Vietnam's century-old railway system is mostly single-tracked and non-electrified, which has remained unchanged over the past decades with very limited capital investments. When comparing train transport to refrigerated trucking, the delivery time is the same although trucks are reported to be less expensive per ton. There are no trains present at the ports.

Refrigerated Shipping

Waterway Network. Vietnam has an extensive network of natural waterways. However, of the nearly 16,000 km of managed navigable waterways, only around 15 percent (about 2,600 km) can reliably handle barges of more than 300 deadweight tons (DWT). Terminal infrastructure and equipment are mostly rudimentary.¹² Newly developed deep-sea ports aim to improve efficiency of port operation by handling larger vessels, thereby relieving congestion at the existing ports located in urban areas.

Maersk. Maersk is active in Vietnam and is looking to eliminate cold chain disruptions that occur through disjointed cold storage operators, independent distributors, and third-party deliveries. They are integrated along the entire chain from the farm and port to the retailer in providing cold chain services. They do not own any storage facilities, but they lease space from cold storage operators. They act as a one-stop-shop for their customers.

Existing Ports. Vietnam's seaport system includes 45 ports and nearly 200 terminals. Vietnam's first deep-sea port, the Vung Tau seaport complex, lies approximately 50 km south from the existing Ho Chi Minh City port complex and has been developed to handle up to 180,000 DWT vessels. Other deep seaports include Lach Huyen in Haiphong, Tien Sa in Danang and Cai Lan in Quang Ninh province. The remainder of Vietnam's maritime ports lack the deep-water terminals, specialized handling equipment, and quays with sufficient length to handle large ships above 50,000 DWT. It was reported to the team that the government is looking to slow the progress of ports closer to HCMC in favor of Phunh. They want to alleviate the traffic as there is more land and pollution reduction. This will increase the cost of transportation.


Cat Lai Port

Size. Cat Lai Port in Ho Chi Minh City is the largest in Vietnam. There are a large number of empty containers within the port premises, so Cat Lai is operating over capacity. Because of this, Cat Lai is considering an extension into another area not adjacent to their existing premises. This port does not allow cold storage within the port premises, though they have had various requests to do so in the past. The same is true for Saigon Newport and Cai Mep (a deepwater port), as they claimed they require too much energy out of their energy availability as well as space from their container. Cat Lai claims that there is enough space outside of the port's premises for cold storage.

Capacity. Cat Lai Port imports 93,000 twenty-foot equivalent unit (TEU) every year. Imports from US are typically meat, chicken, and fruit. In 2019, 198,000 TEU was exported from Cat Lai. Approximately 30 to

¹¹ World Bank.

¹² Khoi, D.K., T. K. Dung, D. K. Son, D. H. Thiepand and P. D. Thinh (2019), "Overview of the Cold Chain for Agriculture in Viet Nam," in Kusano, E. (ed.), *The Cold Chain for Agri-food Products in ASEAN*. ERIA Research Project Report FY2018no.11, Jakarta: ERIA, pp.62-100.



35 percent of food is produced E high-value, time-sensitive cargo. Despite its growing importance, which accounts for about 25 percent of Vietnam's export and import value, infrastructure is still limited. Only four of 22 airports in Vietnam have separate cargo terminals, and two have onsite logistics centers.

Air Freight. Air freight is \$1/KG / \$10 per box delivery and if dry ice is used, it costs \$1.5/KG for dry ice. There is a maximum of 30KG for air freight.

Refrigerated Trucking

Refrigerated Transportation. For imported, chilled, or frozen products, refrigerated containers are transported directly from ports to cold storage houses using container trucks. To transport from cold storages to companies, such as supermarkets and restaurants, small cold trucks are usually used. This is because the urban road infrastructure in Vietnam is characterized by small alleys and exceptionally high rates of using motorbikes.

Cost. One company reported their logistics costs to be \$30,000 per month and US \$400-450 for trucking one 40-foot container to Mekong Delta for 200 km each way. Second hand, 5-year-old trucks from the US cost 50,000 USD/unit. New trucks from Japan cost 120,000 USD.


Freight Brokerage. Freight brokerage services are underdeveloped and fragmented, contributing to inefficiency with reported empty backhaul as high as 50 to 70 percent. While there are some new entrants in the freight aggregator market, a notable lack of pan-Vietnam brokerage operations has resulted in a limited use of technology in logistics solutions. Freight consolidation could also potentially find workarounds for seasonality and other unavoidable factors contributing to empty backhauls and lighter truckloads during certain months of the year.

Road Network. As of 2016 the total length of the road network, excluding village roads, reached over 300,000 km, including about 1,000 km of expressways. However, the national highway is a chokepoint for transit. Trucking time from HCMC to Da Nang is a 30-hour drive by truck while Ho Chi Minh City (HCMC) to Hanoi is 40 hours. From Hi Phong to the Chinese border, there is a superhighway, but heading South to Hanoi, there are no superhighways. The longest transport is from HCMC to Danang and Hanoi to Da Nang. This is partly due to bad road conditions. There is little incentive to use new trucks.

Truck Types. There are two truck types: (i) professional trucks belong to new companies such as ABA Cooltrans or Tan Nam Chinh Logistics; and (ii) modified trucks belong to small transportation companies. Professional trucks range from one ton to fourteen tons with real-time updates on cargo to clients, global positioning system-enabled for real-time tracking, data loggers for temperature monitoring, and multi-temperature adjustment. Modified cold trucks are mainly small for urban services and locally produced and usually under two tons.

Modified Trucks. A typical modified cold van is equipped with an air conditioner to control the temperature at the desired levels of each product category. However, according to experts, the setting of air conditioners without air tubes on the top do not spread cold air evenly inside the truck chamber, and thus do not ensure the quality of the transported products. However, the setting of the air conditioner systems of professional trucks is well designed and constructed to maintain the cool air spread evenly in the chambers. Most of these trucks are imported from Japan or Korea.

Refrigerated Trucking Capacity. There are a number of large trucks in Vietnam that carry 40-ft containers. There are ten competitors in Vietnam in the reefer trucking business with the largest owning 400 trucks.



Fragmentation of Trucking Sector. The sector, which is among the most critical players in the logistics sector, is highly fragmented with truck operators reporting that about 60 to 70 percent of the time, their trucks return empty. Underdeveloped non-asset-based brokerage and intermediary services, along with limited automation and use of technology further constrain the ability of the trucking sector to consolidate cargo efficiently.

Maintenance. Many of the trucks are of Japanese make and model with maintenance completed by dealers located in South Vietnam, where there are three locations for maintenance, or the North Vietnam, where there is only one.

Traffic Concerns. The city authority has taken some initiatives to streamline the traffic in the city. Cargo truck movement in the city is only allowed during off-peak hours from 9:00 p.m. to 9:00 a.m., which reduces peak-hour traffic congestion. However, the restricted timing also leads to congestion at city entry points during the restricted hours.


Business-to-Consumer. There is a growing demand for refrigerated transportation (distribution purposes) for fruit and vegetable transport. In addition, business-to-consumer (B2C) cold services carry out very flexible solutions to deliver goods to customers by using motorbikes attached with ice boxes on the back to keep food cold or chilled. However, on hot days, ice boxes are insufficient to maintain low temperatures, leading to the rapid deterioration of food.

Regional Trucking. There are not enough refrigerated transportation companies to transport North to South. The North is harder to penetrate than that in the South due to the limited scale of goods flows, land availability, smaller retail market, and higher institutional obstacles. The cost to move goods to the south is high. Some products are shipped by train to the south (2 days) in Styrofoam boxes, which take five to seven days to arrive by boat from North to South.

Challenges. Reefer gensets are being turned off during transport, allowing the truck to be warmed. Mechanical issues for cooling maintenance on trucks are frequent. Container offloading and devanning is often done outside in the heat as many stores, including large stores, do not have refrigerated loading docks. Most customers delete yearly records of historical data, leading to a lack of background knowledge and properly maintained files. Restricted operating hours in Ho Chi Minh City further complicate trucking routes, as trucks are prohibited from certain areas during rush hours. Because of this, 70 percent of deliveries are made at night, and there is a maximum of four to five drops-offs per trip. Route planning would optimize reefer truck deliveries.

COLD STORAGE

Overview. Vietnam is considered to be ripe for investment by some as they deemed it too late to invest in Indonesia, Thailand, or Malaysia and too soon for Laos, Cambodia, or Myanmar. In general, it has good infrastructure for public refrigerated cold stores, especially around Ho Chi Minh City and to a lesser extent around Hanoi with a cluster of processing fish facilities with cold storage capacity at the Mekong River. The rest of the country is not well served, and cold stores are scarce and older. Most cold stores visited ranged between 10,000 to 25,000 tons capacity and tend to be larger in the South. The more modern facilities are of American and Japanese ownership or Joint Ventures. There is one fully automated facility now owned by Lineage Logistics. Of these modern facilities, most have steel structures with insulated panels and racking systems up to six pallet heights; no mobile racking was observed. Enclosed refrigerated



docking areas are predominant with dock levelers and insulated docking doors. Ammonia (NH₃) is the predominant refrigerant in the country.

Warehouse Operations

Demand. Vietnam market for food cold storage is only 20 percent satisfied. Halong Foods expects demand for cold storage will increase by 30 percent per year over the next few years. An estimated 90 percent of space is for imports and 10 percent for exports. The demand is inconsistent. It spikes around the lunar year when the storage demand is far higher and May to June which is the shrimp harvest season. October is a big shipping time for export. Fresh food producers require more capacity. Currently, there is a shortage of IQF, needed for smaller seafood processors who will normally use the services of trading companies. It was reported that there is a lack of storage for cheese and chocolate and that poultry and pork producers are lacking Individual Quick Freeze (IQF) facilities near production sites which is causing small producers to be priced out.

Private Warehouses. Seafood exporters typically own their frozen storage and do not use 3PL services. Typically, new cold storage companies follow a timeline of building for themselves only after they have worked for others. Often these companies will use a pre-existing container or building to build in.

Logistics Service Providers. Logistics service providers (LSP) in Vietnam consist of diverse businesses, but asset-based, more basic operations, dominate when compared to the international trends. There are three types of 3PLs in Vietnam. One type includes US owned companies and Australian companies. A second type are Vietnam investors like Transimex Corporation. The third type is also Vietnam owned but not all services are provided and not the best and most advanced technology. Customers include the major multinational companies.


Capacity. Estimations of the total commercial capacity is between 500,000 to 600,000 pallets. Cold chain warehousing capacity is estimated to have quadrupled over the past ten years. HCMC has adequate supply for capacity this year, though Hanoi and Da Nang are lacking greatly (one interviewee suggested that there are 80,000 pallet positions in all of Hanoi).

Land. A foreign company can own 100 percent of a business but not the land which must be leased for 50 years. Land is priced up to 250 USD per square meter.

Value-Added Services. While not offered by the majority of facilities, the most modern warehouse did offer services including classification, labelling, tallying, distribution, scanning/barcoding, and packaging. These services were supported by an advanced IT System with customized Standard Operating Procedures (SOPs), Warehouse Management Systems (WMS) and Supply Chain Management (SCM), and integrated Electronic Data Interchange (EDI) for tracing and tracking.

Regional Challenges. Commercial cold storage services in the South have developed far ahead of the North, demonstrated by the outstripped number of both foreign and domestic cold services providers as well as their sizes in the former compared to the latter. The flow size of import and export goods, the higher competitiveness and support of the provincial government, land availability, and favorable transportation conditions have led to the supremacy of the South in the cold storage market. In the last two years, it is acknowledged that there is a shift up North of both domestic and foreign cold storage players. This is also in part due to the seafood production, processing, and export in the South. The North tends to be more government-focused while the South has a higher concentration of businesses.

Labor. The average wage in urban locations is \$300 to \$400 USD per month.



Pricing. It costs \$10,000 per month to lease a 1000 pallet warehouse. Costs associated with 3PLs are inflated for processors as there is no direct business relationship from processor to cold store. In and out handling for pallets is \$2.00 per pallet total or US \$1 per pallet each way per day. The average storage cost in Vietnam is US \$1 per pallet, per day.

Pallets. Pallets are up to 1.2 meters high and up to 800 kg per pallet.

Information Technology. IT systems are basic, and back-ups are rarely kept.

Design Build

Design. Land can be rented for 50 years within industrial parks and land can be owned outside of industrial areas. Foreigners can own 100 percent of the land. One company reported a 10-month build time.

Maintenance. There are very few technical experts in cold store installations. The lack of refrigeration technicians for cold storage and reefer trucks slows progression, and back-up refrigeration systems are limited due to unreliable maintenance and repair services. The builder provides technical support for running the equipment and operating the cold store.

Structural. Construction details and finishing could use some improvement in terms of training.

Walls. The walls are mostly insulation panels made in Malaysia or Turkey, and they are in good condition. Polystyrene panels (either expanded or extruded, EPS or XPS, and mostly Polyurethane (PUR)) are common. Polyisocyanurate (PIR) is found in newer facilities.

Floors. In general, the floors are installed in good condition and are kept in good condition.


Refrigeration. A Liquid Natural Gas (LNG) plant is being built in Vietnam. R507A is currently in-use commonly. It is an HFC blend designed to be a replacement for R502 in low and medium temperature refrigeration applications. It is similar in characteristics to R404A however, being an azeotropic blend, R507A does not suffer from glide or fractionation making it suitable for additional applications such as centrifugal compressors. Freon 404A (R-404A) is a blended hydrofluorocarbon (HFC) refrigerant comprised of R-125, R-134a, and R-143a. It was designed to replace R-502 and R-22 used in commercial refrigerator equipment for low and medium temperature ranges. R404A will soon be banned in new refrigeration applications in Europe, and from 2020 onwards, only recycled refrigerants can be used for servicing. CO2 is expensive. Order time is eight months for the US equipment.

Doors. Most doors are insulated rigid cold store doors that are made in Vietnam through a Joint Venture with Japanese or French companies. Some cold stores have flexible automated quick doors also.

Lighting. There is a tendency to use LED lighting, especially inside the chamber rooms but they are not yet automated, which would save energy.

Material Handling. The predominant makers of material handling equipment are Chinese and Japanese (Toyota) with some European (Still- Kion Group). Batteries are usually provided along with the material handling equipment. Lithium batteries are not yet too common in Vietnam.

Fire Prevention. Most facilities do not have sprinklers, and fire doors were observed in one facility. Extinguishers and hoses were observed in in most locations.



Racking. There is no mobile racking in Vietnam. Ten-meter height is the maximum height they recommended for manual racking systems for cold storage facilities.

Dock Equipment. Most have enclosed refrigerated docking areas but with great difference in sizes between the facilities visited. The team observed insulated docking doors with levelers, mostly automated and in general, in good condition.

Automated Systems. Zoning regulations limit building height to 20 meters, which makes them too short for automation. However, Three Japanese companies have joined together to build a hi-tech cold storage in Vietnam. It is anticipated that automation is a trend to watch in the next years.

Building Codes. Building codes are getting stricter. For 2020, for a 10,000 square meter area, max construction is 60 percent and up to 10 meters high. Thirty-meter-high buildings will have a maximum construction area of 39 percent of the total area. Facilities at 40 meters high is down to 35 percent. Building codes depend also on specific areas. Industrial buildings are limited to construction within industrial parks.

Electricity. Vietnam faces an unreliable power supply. Electrical costs are average of 0.17 USD per Kwh (Kilowatt per hour) on the higher tide and 0,10 USD per Kwh on the lower tide. The government is investing in solar power.

RETAIL

General. Food service in Vietnam is acceptable but not optimal. There is understaffing in foodservice staff and cooks and an increasing demand from domestic consumer and foreign tourism. Warehouse space is lacking, which lends to logistics and skilled handling operations shortfalls. Temperature integrity is the largest problem, as operators turn off the cooling units. Education of consumer will help drive “Frozen is Fresh.” Cold storage is the largest cost to cold and chilled food logistics in Vietnam, followed by refrigerated transportation.

Distribution. According to one fresh produce importer, 55 percent of fresh fruit and vegetables are distributed to modern retailers, 33 percent to wholesalers, and 12 percent online. Delivery is completed via motorbikes with cooler packs and temperature tags to ensure temperature quality. Convenience stores do not have a central Distribution Center; they usually operate direct to store.

Challenges. General importers, distributors and retail workers need training on handling frozen and chilled foods.

Training. Training occurs in-house if it occurs at all. Construction companies may arrange training for their warehouse operations staff, but there is a demand for cold storage operations training and for new staff. The retail sector is far ahead of sectors in terms of food hygiene, control and Hazard Analysis of Critical Control Point (HACCP) procedures. Retailers can push for better cold chain conditions in Vietnam.

GOVERNMENT REGULATIONS¹³

Relevant Ministries. Currently, the Vietnamese government has not established a strategy or specific policy framework for promoting cold chain. Food products in Vietnam are regulated and managed by three ministries: Ministry of Health (MOH), Ministry of Agriculture and Rural Development (MARD), and Ministry of Industry and Trade (MOIT). The registration of cold transportation vehicles is the responsibility of Vietnam Register under the Ministry of Transportation.

- The MOH has the prevailing general management power and is responsible for most prepackaged and processed food.
- MARD is assigned the responsibility of managing meat, fisheries, fruit and vegetables, eggs, and raw milk. The National Agro-Forestry–Fisheries Quality Assurance Department (NAFIQAD) and its local branches (under MARD) are authorized to issue food safety certification to cold storage for agricultural products and foods.
- MOIT is responsible for managing alcohol, beverages, processed milk, and veggie oil and has been authorized to issue food safety certification to hypermarkets, supermarkets, and other modern retail channels.


Food Safety. The top policy influencing cold chain service is the Food Safety Law, enacted in 2011 in which temperature-related conditions are stated in Provision 1b of Article 20, “Food producers and traders must meet the following conditions for food preservation: Preventing the effects of temperature, humidity, insects, animals, dust, strange smell and negative environmental effects: guaranteeing sufficient light: having special-use equipment for adjusting temperature, humidity and other climate conditions, ventilation equipment and other special preservation conditions required by each type of food.” The government is moving to educate the consumer about Hot Meat and traditional market slowly. Law No. 55/2010/QH12, which lays out the specifications and rights of producers, processors, traders, and consumers. Additional laws include:

- Law on the Quality of Products and Goods 05/2007/QH12 –stipulates that manufacturers and traders must take responsibility for the quality of the goods or products
- Law on Standards and Technical Specifications 68/2006/QH11
- Decree No. 38/2012/ND-CP –provides guidance to MARD, MOIT, and MOH on implementing provisions of the Law on Food Safety
- Decree 43/2017/ND-CP– food labeling regulation

Logistics Development. Decree 163/2017/ND-CP creates room for foreign investors to join logistics services in Vietnam by specific regulations on the “rights of foreign investors to acquire shares, contribute capital or establish an enterprise in sea transport, container handling services, customs clearance, inland waterway transport services, road transport services.” Directive 21/CT-TTg promotes the implementation of solutions to reduce logistics costs and effectively connect transport infrastructure. It also attempts to link more effectively transport infrastructure and lower logistic costs, thereby encouraging integrated logistics services and motivating e-commerce retail.

Food Standards. Vietnam has formed a range of technical requirements for frozen shrimp, pangasius, and raw fishery materials requiring temperature control. TCVN 4379 was the first standard on frozen fish

¹³ The information in this section relies heavily upon The Cold Chain for Agri-food Products in ASEAN publication, cited as Khoi, D.K., T. K. Dung, D. K. Son, D. H. Thiepand and P. D. Think (2019), “Overview of the Cold Chain for Agriculture in Viet Nam,” in Kusano, E. (ed.), The Cold Chain for Agri-food Products in ASEAN. ERIA Research Project Report FY2018no.11, Jakarta: ERIA, pp.62-100.



exports and was issued more than 30 years ago in 1986. The most recent one is TCVN 12429:2018 issued in October 2018 on chilled meat and its technical requirements.

Enforcement. Despite the presence of a regulatory framework, the main challenge relates to enforcement or the lack of effective incentives to induce widespread voluntary compliance with regulations. With a fragmented cold chain, full regulatory oversight is difficult and broad regulatory enforcement has not been prioritized. However, phytosanitary regulations have become stricter in recent years and all containers are now required by the government to be inspected.

Agriculture Restructure Program. In 2013, the government issued Decision 899/2013/QD-CP by the Government on Agricultural Restructure Program, which would transform Vietnam's agricultural sector towards a high-value, sustainable development model. As a result of this policy, MARD is leading the transition from traditional grain crops, such as rice and maize, to high-value vegetable, flower, fruit, and aquaculture production.

Post-Harvest Technology Promotion. To promote the post-harvest technology application for agricultural production, Decision 68/2013/QD-TTg targets mitigating losses in post-harvest stages through credit support to purchase machines and equipment, including refrigerated cargo, machines for producing ice, and cold storage facilities. However, the policy has not been appreciated due to low accessibility to targeted groups, especially farmers, cooperatives, and farming households. Meanwhile, the cold services providers surveyed and interviewed by the research team confirmed they were not aware of the policy.


Customs Rules. The duty on frozen goods is 20 percent while chilled has a 40 percent duty. Customs authorities assign value to products, which increases the duty tariff. Officials require a clear label that includes the name in the description of product (for example, frozen chicken leg). All products must be labeled in Vietnamese.

Financing. Vietnam's Ministry of Finance lends cash or inputs to farmers directly or through small lending programs. Such loans are subject to rapidly changing policies and the government tends to focus disproportionately on the rice sector and other cash crops for export. Government loans also tend to be short-term, although the agricultural sector needs long-term loans to finance capital and productivity improvements.

ASSOCIATIONS

The team was told that Vietnam is not very open to trading associations, as there are cultural issues against them and as most operators consider themselves to be the best, they were not keen to meet with their competition. However, the team did meet with several associations, of which the most relevant are detailed below:

- Vietnam Logistics Association (VLA). Offers training & workshops. This association is under the Ministry of Industry and Trade.
- Vietnam Logistics Institute (VLI). Provides training similar to Mekong Institute but is closer to Vietnamese companies. VLI is the subsidiary of the VLA. Founded in 2010, it is budgeted through government funding and school fees and has 10 full time employees and 30 industry experts and contributors. Its main operations include research and consulting; education and training; seminars and events. VLI be a partner for cold chain training.
- Mekong Institute. Supports Vietnam, Laos, Cambodia, Thailand and Myanmar with transport & training.

- 
- Vietnam Automobile Transportation Association (VATA). Lobby the government for surface transport.
 - Ho Chi Minh Logistics. Subsidiary of VATA.
 - Vietnam Association of Seafood Exporters and Producers (VASEP). Provides information on regulations and conferences for seafood companies as well as short-term training services.

SWOT for Food and Agriculture sector

Strengths

- Rising disposable income boosts demand for higher quality and safe food and food ingredients.
- US products considered high quality and safe.
- Modern retailers favor US brands.
- Global retail brand awareness is increasing as more international brands enter Vietnam.
- Growing youth and middle-class population with rapid urbanization is leading to more eating out, traveling, shopping in supermarkets and hypermarkets, and increased consumption of convenience and processed foods.
- Growing perception of modern retail outlets as cleaner, safer, more comfortable, more enjoyable, and containing more diverse food and beverage products.
- The growing number of modern retail chains increases the opportunities for imported products.
- High-end shops, restaurants, luxury hotels, and resorts target niche consumer groups and tend to use higher quality imported food and ingredients.
- Vietnam has robust e-commerce sales with young population and growth of internet and smart phones.
- Local food processors are increasing production capacity, food quality, and packaging initiatives with marketing strategies and new products to meet growing demand of consumers and export markets.
- In some subsectors, locally produced food ingredients cannot meet the demand of processors due to seasonality, especially in the dairy, bakery, and other food processing sectors.
- Vietnam's continued economic integration and FTA negotiations give more openings to foreign products.

Opportunities

- Fast growing modern retail market.
- Fast growing middle class population.
- Increased demand for safe and premium quality products.
- Relatively young population.
- Good economic growth.
- Low unemployment rate.
- People moving to urban areas for higher paying jobs.
- Growing demand for packaged convenience foods and delivery.
- Growing demand for organic and natural foods.
- Strong and growing food service and hotel industry.

Weaknesses

- Uncertainty of government regulations negatively impacts local importers of food and food ingredients.
- Registration with government authorities for new food and food ingredient products, especially functional foods, is costly and burdensome.
- Increased sanitary and phytosanitary (SPS) barriers on animal and plant origin products persist.
- EU and Asian brands are entering Vietnam.
- Most low and middle-income households in small cities and rural areas cannot afford imported products.
- US products and ingredients are expensive to middle-class households in first-tier cities.
- US exporters are often perceived as unresponsive to the local business environment (e.g., some US products are packed in large sizes that limit purchases).
- Vietnamese authorities have intensified customs measures to control the imports of agricultural products.
- Reference prices are often higher than sale contract prices.
- US competitors, including the EU, Canada, New Zealand, Korea, and Japan, also have access to the Vietnam market for many consumer-oriented products.
- Limited infrastructure and distribution for perishable products in Vietnam (such as cold chain).
- Ports cannot handle the larger more cost-efficient container ships.
- Poor road infrastructure/maintenance and traffic congestion in the major cities has significant negative impact on transporting temperature-controlled products in a timely and most cost-effective manner.
- Significant lack of cold storage capacity in the country.

Threats

- Free trade agreements with competitor countries and not the US gives competitors a significant tariff/cost advantage for some products.
- Technical trade barriers.
- Freight rates are higher and delivery times are longer compared to major competitors – China, Australia, and New Zealand.
- Relatively strong US dollar makes US products more expensive.
- Covid-19 pandemic impact on global trade.

MARKET OPPORTUNITIES

There are excellent market opportunities for growth in US exports of temperature-controlled products to Vietnam in the short (2020-2023) and long-term (2030). Based on the trend in US food and agricultural exports (in particular, the consumer oriented product category that includes all temperature-controlled products) to Vietnam over the past five years, growth has been very good in fresh fruit, poultry, dairy products, beef, processed vegetables, and pork. To a lesser extent, US exports of fish, processed fruit (raisins and prunes), and wine have also done well but sales are trending down.

Vietnam is already a large and important market for US food and agriculture products, ranking sixth in the world reaching a record high of nearly US\$ 4.5 billion in calendar 2018. In that year US ag exports to Vietnam were over a billion dollars greater than exports to both Indonesia and the Philippines (the next two largest markets in ASEAN) which were the 10th and 11th largest US ag export markets, respectively, in the world. Furthermore, the surpassing of Indonesia and the Philippines has occurred despite the fact that those two countries each have a much larger population and economic (GDP) base.

Other factors bode well for continued growth in US temperature-controlled food exports to Vietnam:

- **Declining Unemployment Rate:** Vietnam's unemployment rate has been under 2.5 percent from at least January 2012 – and prior to COVID was declining every month since January 2020.
- **Ease of Doing Business:** With a ranking of 70, doing business in Vietnam is still problematic but it ranks as good or better than the US in two categories important for cold storage investment, that is, dealing with construction permits (25 compared to 24 in the US) and getting electricity (27 compared to 64 in the US).
- **Fish and seafood is a win-win for cold chain investment:** Vietnam is a fish and seafood exporter to the US and to the world and is also a good market for US fish products. Thus, improved cold chain infrastructure and services will be driven by the need for both exporting and importing temperature-controlled products such as fish and seafood.
- **Even Trade Balance in Food and Agriculture:** The food and ag balance of trade between the US and Vietnam has been roughly even over the past five years which makes it more likely that both countries will have a mutual interest in maintaining open trade in this sector.

The greatest short (2020-2023) and long-term (2024-2030) opportunities should develop in line with:

- low unemployment, strong economic and per capita income growth
- rapid growth in the size of the middle class, size of the young population, and urban employment
- growth in tourism, food service (quick serve and family style restaurants), and modern hotels
- rapid growth in modern retail markets
- increased demand for safe and premium quality food products

The greatest growth and opportunities for exports of US temperature-controlled products are shown in the table below ranked based on the estimated 2025 trend value. The best opportunities appear to be for fresh fruit (apples, table grapes, and cherries), poultry meat (frozen legs and leg quarters), dairy products (non-fat dry milk and whey), beef (frozen boneless and bone-in cuts), processed vegetables (frozen fries and other frozen potato products), and pork (frozen offal, feet, and meat). **Greater investment in the country's cold chain infrastructure - coupled with handling, operations and management training**

and education recommendations provided in this assessment - the estimated value of those selected US exports should exceed the 2025 trend estimates and total over \$1 billion by 2025 and beyond.

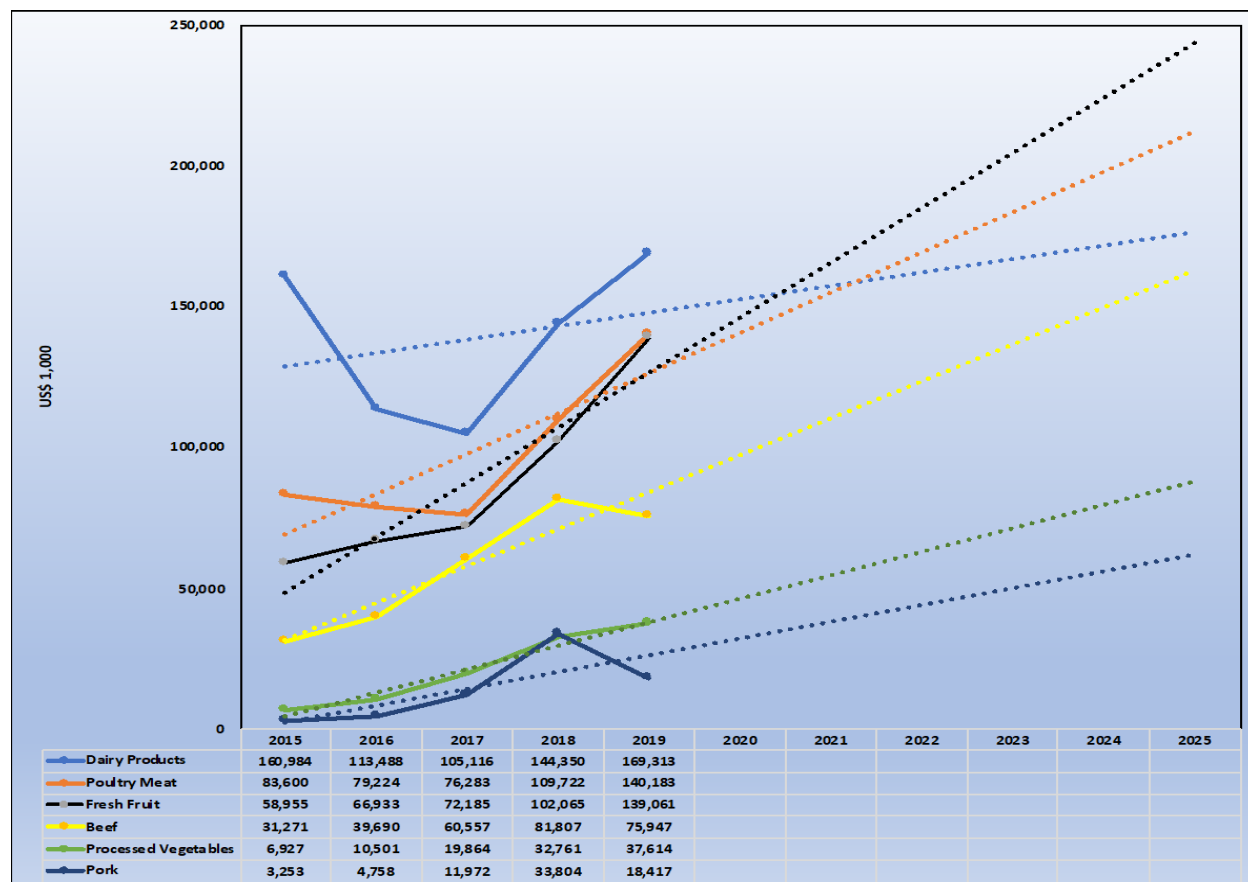
Table 9. Ranking of Best US Ag Export Opportunities to Vietnam and Estimated Value in 2025 (US \$1,000)

Product	2019 Value	2025 Value *	% Increase
Fresh Fruit	139,061	245,000	76%
Poultry Meat & Products	140,198	220,000	57%
Dairy Products	170,100	175,000	3%
Beef & Beef Products	76,146	165,000	116%
Processed Vegetables	37,402	85,000	127%
Pork & Pork Products	18,580	60,000	223%
TOTAL	581,487	950,000	63%

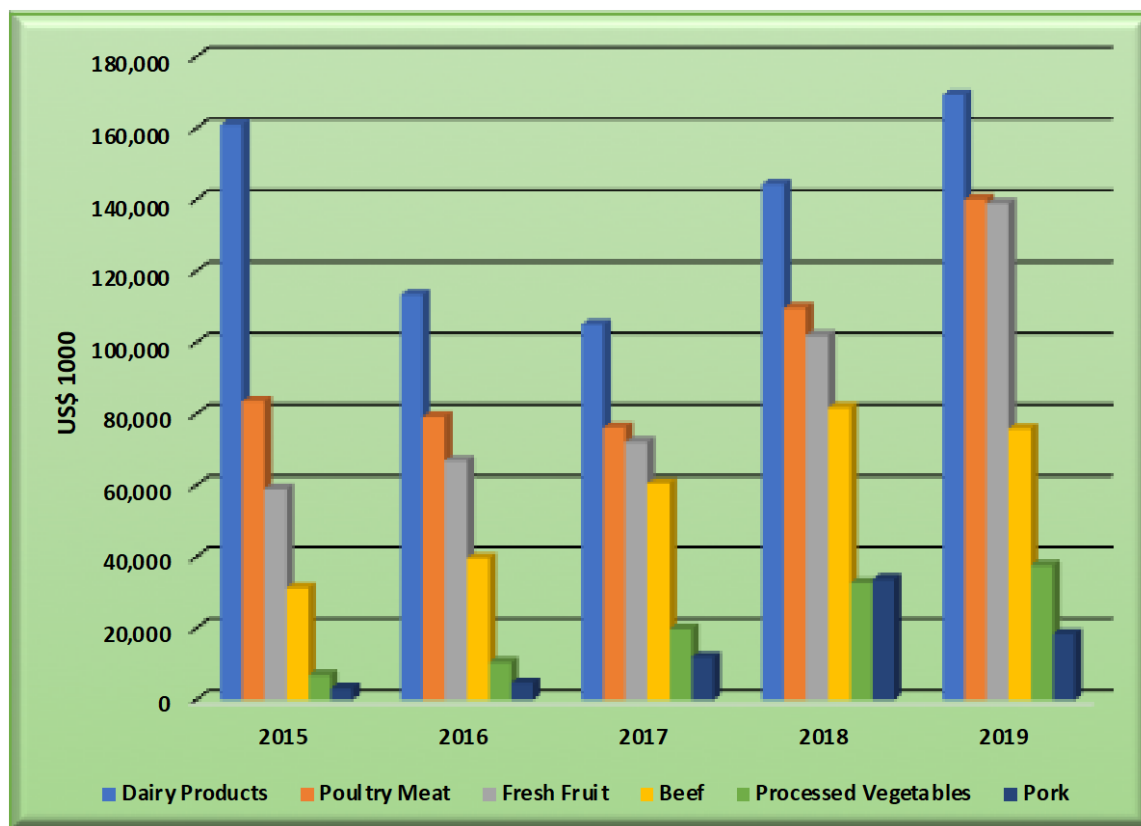
* Trendline Estimate

The following graphs show the value of the above US exports to Vietnam from 2015 to 2019 and our growth estimates based on a linear trend line to 2025.

Figure 11. Selected US Actual and Estimated Agricultural Exports to Vietnam (US \$1,000)



**Figure 12. Selected US Agricultural Exports to Vietnam from 2015-2019
(US \$1,000)**




RECOMMENDATIONS

Buyers Conference. Buyers in the US need to put pressure on their Vietnam suppliers to make sure they follow good cold chain handling and management practices. Sellers from the US and other countries need to demand that their products are handled appropriately.

Training. Training should focus on the managers with priority training on cold chain and retail operations. Specific issues include:

- Product handling training by product type.
- Food safety and staff safety for people moving in and out of cold storage facilities.
- Best practice processes for receiving and delivering food.
- Management systems and modern technology for those systems like scanning apps.
- Temperature control management during delivery – how to keep the products in truck at even cold temp when making multiple drops per trip.
- Training on handling and storage of products on a product-by-product basis.
- Proper handling of products at the retail level and cold storage operations.

- 
- Ammonia and freon installations depending on temp and sizes. CO2 coming for small stores.
 - Layout of warehouse for most efficient moving of products.
 - Establishing Key Performance Indicators (KPIs).
 - Most efficient use of the available space.
 - Warehouse management IT systems for inventory control that would be the most efficient and cost effective for Vietnam.
 - More sanitation requirements (probably HACCP training).
 - Manuals & Certifications should be provided.

Transportation Focus. Should focus on food safety, temperature issues, and temperature control, along with the processes for delivering and receiving food.

Local Association Involvement. Third party cooperators might include the Vietnam Seafood Association VASEP and the Fruit Association. Recommended to get in contact with VLA (Vietnam Logistics Association) for more info on Vietnam and might be a way for GCCA to put a foot in the country.

Introduction of Technology. An overview of the various technologies to help manage all operations along the cold chain would be helpful. Can also include refrigeration systems (and pricing) and racking systems.

Multimodal transport. We found that multimodal transport could be a resilient strategy in that less reliance on one mode would reduce the expected economic losses. Building truly multimodal connectivity, however, is a challenging task that would require improvement in infrastructure, regulatory framework, market incentives, and development of logistics services. Currently, the key bottlenecks preventing Vietnam from achieving efficient multimodal connectivity include (a) the lack of containerization on inland waterway transport, (b) underdeveloped river ports with poor land connectivity and rudimentary cargo handling equipment, and (c) underutilized potential of domestic coastal shipping constrained both by infrastructure and market structures. Overcoming these roadblocks to achieving a more resilient transport system in Vietnam would require concerted efforts across multiple stakeholders.

ANNEX A: CONTACTS

Organization	Individual Name	Position	Address	Phone Number	Email
Green Life Investment	Ms. Diep Nguyen; Ms. Duyen Le	CEO; Co-founder, Seven Seas Director	Villa B24, Duong 30, Tran Nao Street, An Phu, District 2	+84 909180540	duyen.le@greenlifecorp.com
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OOCL (cancelled event)			37 Ton Duc Thang St., District 1		
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Chef's Market	Phil Phong Nguyen	Co-Founder			
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Mega Mart (MM) Hypermarket	No contact				
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Viet Hoa (large 3PL) Warehouse	Led by Mr. Loi of My Hoa Company		936 Bach Dang St., Thanh Luong, Hai Ba Trung District, Hanoi		

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Bao Quang (meat, dairy and fresh fruit importer)	Ms. Le Pham	Vice Director	80A, Ngo 12, Dang Thai Mai Street, Quang An Ward, Tay Ho District	+84 932565696	
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ANNEX B: MARKET FACT SHEETS FOR FOOD RETAIL, FOOD PROCESSING, & HRI

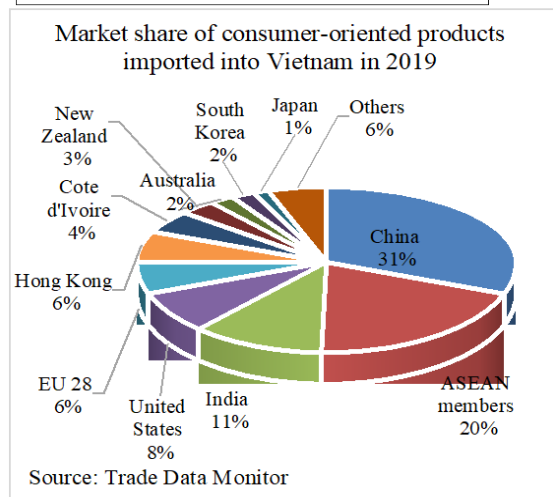
Market Fact Sheet: Vietnam

Executive Summary

Vietnam has remained one of the fastest growing economies in Asia, with gross domestic product (GDP) growth in 2019 reaching 7 percent. In 2020, GDP growth is forecast down to 2.8 percent due to negative impacts of the COVID-19 pandemic (World Bank).

According to Trade Data Monitor (TDM), global exports of consumer-oriented and agricultural related products (distilled spirits and fish products) serving Vietnam's retail food channels were down 22 percent year on year, from \$20.4 billion in 2018 to \$15.9 billion in 2019. U.S. exports remained steady at \$1.1 billion, but U.S. market share rose 1 percentage point, from 6 percent in 2018 to 7 percent in 2019. Vietnam is the 12th largest market for U.S. consumer-oriented products, seafood, and distilled spirits.

Imports of Consumer-Oriented



Food Retail Industry

Small, traditional retailers still dominate Vietnam's food retail sector, but modern retail channels are expanding in response to growing consumer demand. In 2019, Vietnam's total retail sales of goods and services was approximately \$213 billion, up 11.8 percent over 2018, in which food and beverage retail sales were estimated at \$51 billion [Vietnam's General Statistics Office (GSO) and Ministry of Industry and Trade].

Quick Facts CY 2019

Imports of Consumer-Oriented Products

- Imports from the world: \$12.8 billion
- Imports from the United States: \$973 million

Top-10 Growth Products in Vietnam

Dairy products	Prepared food
Poultry	Pork and pork products
Fresh fruits	Processed vegetables
Beef	Chocolate and cocoa products
Non-alcohol beverages (ex. juices)	Snack food NESOI

Food Industry by Channels in 2019 (billion USD)

Manufacture of food products	\$62.5
Manufacture of beverages	\$7.4
Exports of fishery products	\$8.5
Exports of fruits and vegetables	\$3.7
Exports of cashew nuts	\$3.3

Total retail sales of goods and services 2019: \$213 billion

Top-10 Vietnamese Retailers

Aeon Mega Mart	Vinmart
MM Mega Market	Circle K
Big C	7 Eleven
Co.op Mart	Bach Hoa Xanh
Lotte Mart	Satra Food

GDP/Population 2019

Population	97 million
GDP	\$262 billion
GDP per capita	\$2,564

Sources: TDM; GATS; GSO; Vietnam Customs

Advantages	Challenges
U.S. products are perceived as safe and of premium quality.	U.S. products are still more expensive than their peers, partly due to higher tariffs and freight costs.
Growing market demand and increased focus on food safety	Free trade agreements reduce tariffs on competitors' products.

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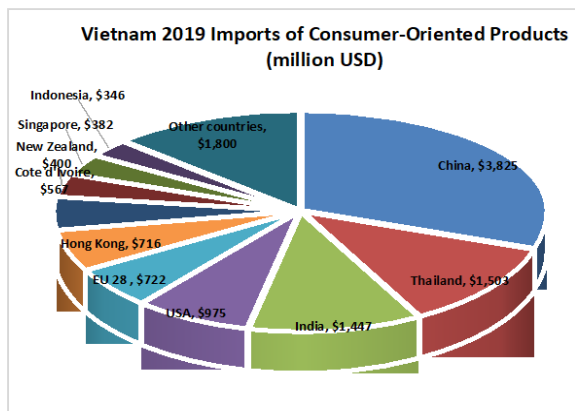
Source: [USDA/FAS GAIN Report VM2020-0069, "Retail Foods", July 8, 2020](#)

Market Fact Sheet: Vietnam

Executive Summary

Vietnam is a lower middle-income country in South East Asia, with a total population of 96.5 million, with 68 percent of the population between the ages of 15-64. Vietnam has a low unemployment rate of about two percent. The annual Gross Domestic Product (GDP) growth over last five years is over six percent. In 2019, Vietnam's GDP reached \$261 billion with a growth rate of seven percent. Vietnam is a major producer and exporter of rice, coffee, fishery products, and processed cashew products. In 2019, Vietnam's agricultural exports of the top ten agricultural products reached \$35.9 billion, equivalent to 13.6 percent of total exports (Vietnam General Statistics Office- GSO). Vietnam's imports of agricultural products were \$24.5 billion. U.S. agricultural and related products exports to Vietnam were about \$4 billion (Trade Data Monitor-TDM). Vietnam was the 7th largest importer of U.S. agricultural and related products.

Imports of Consumer-Oriented Products



Market Situation

In 2019, Vietnam imported consumer-oriented products valued at \$12.8 billion (TDM). China, Thailand, India, the United States, and EU28 were the top five markets making up 67 percent of the total import value. U.S. exports of consumer-oriented products were \$975 million equivalent to 7.6 percent of total Vietnamese imports.

Food Processing Industry

The Food and Beverages (F&B) manufacturing industry recorded 10,034 active enterprises in 2017 with more

Source: USDA/FAS GAIN Report VM2020-0030, "Food Processing Ingredients", April 13, 2020

than 597,000 employees. Food manufacturing turnover was \$55 billion in 2017, accounting for 15.6 percent of total revenue of the processing (manufacturing) industry.

Vietnam food retail sales reached about \$50 billion, an increase of 13.2 percent compared to previous year, and accounted for 31 percent of total retail sales of goods in 2019.

Quick Facts CY 2019

Imports of Consumer-Oriented Products (US)

- Imports from the world: \$12.8 billion
- Imports from the United States: \$975 million (7% of market share)

List of Top 10 Growth Products in Host Country

- | | |
|-------------------------------------|---|
| 1) Fresh fruit | 2) Beef & Beef Products. |
| 3) Tree Nuts | 4) Fresh Vegetables |
| 5) Food Preps.& Misc | 6) Processed Vegetables |
| 7) Dairy Products | 8) Non-Alcoholic Bev. (ex. juices, coffee, tea) |
| 9) Poultry Meat & Prods. (ex. eggs) | 10) Spices |

Food Industry by Channels (U.S. billion) 2019

Food Industry Output	\$ 55 (2017)
Fisheries Exports	\$ 7.62
Fresh fruits and vegetables exports	\$ 0.98
Unroasted coffee exports	\$ 2.36
Fish Imports	\$ 2.2
Dairy products imports	\$ 0.95
Fresh fruits imports	\$ 2.49
Fresh and processed vegetables imports	\$ 2.14
Food Retail	\$ 50
Food and lodging service	\$ 25.5
Total retail sale of goods and services 2019: US \$214 billion	
Total retail of goods: US \$163 billion	

Top 10 Retailers

Masan (Vinmart)	Aeon Mart
Central Group (Big C)	Lotte Mart
Saigon Coop Mart	Satra Food
BRG Retail	Bach Hoa Xanh
MM Mega Mart	Circle K

GDP/Population 2019

Population (millions): 96.5
 GDP (billions USD): 261
 GDP per capita (USD): 2,740

Sources: GATS, Vietnam's GSO, MOIT, TDM, Post Vietnam

Strengths/Weaknesses/Opportunities/Challenges

Strengths	Weaknesses
U.S. products are perceived as safe and premium quality	Higher prices
Opportunities	Challenges
Retail market is growing fast. Middle class population is increasing	Free Trade Agreements and technical barriers

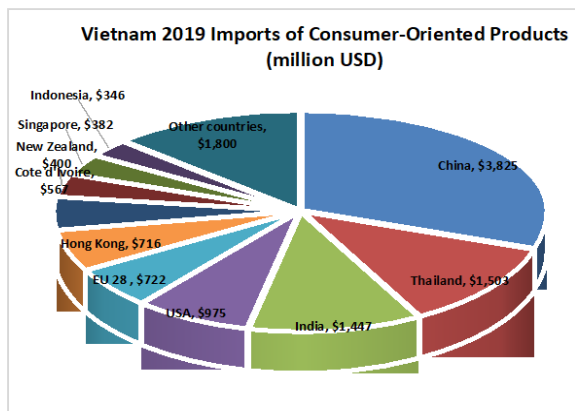
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Source: USDA/FAS GAIN Report VM2019-0069, "Exporter Guide", December 31, 2019

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