SYNTHESIS

Golden Horseshoe Food and Farming Alliance

Ontario Carrot Value Chain Analysis

January 3, 2020

Ontario AgriCentre, Suite 109, 100 Stone Road West, Guelph Ontario, Canada N1G 5L3 Ph 519-822-7272 E info@synthesis-network.com **synthesis-network.com**

WE GO BEYOND

Contents

Production **3**

Supply and Disposition **9**

Consumption 12

Market Trends 13

Trade **15**

Import 15

Export 16

Seasonality 17

Observations **18**

Opportunities **19**

Appendix **20**

Ontario Carrot Value Chain Infographic 20

Ontario Carrot Production by County 21

Ontario Processing Carrot Statistics 23

Ontario Licensed Processors for Carrots 2019 24

Production

Carrot is an important field vegetable with long, cool growing seasons, grown in all regions in Canada. In 2018, carrots generated just under $130 million in farm gate value nationally.[1] Ontario and Quebec produce the majority of carrots for Canadians, accounting for 42% and 36% respectively. The 2016 Census of Agriculture reported 916 carrot farmers in Ontario.[2]

Source: Holland Marsh Growers' Association

Production Regions	Area planted (acres)	Share of area planted	Area harvested (acres)	Total production (tons)	Marketed production (tons)	Farm gate value (thousand dollars)
Canada	20,618	100%	20,096	391,044	382,877	129,882
Ontario	8,657	42%	8,498	198,674	198,674	43,470
Quebec	7,414	36%	7,263	119,522	111,845	50,129
Nova Scotia	1,453	7%	1,399	33,983	33,845	x
British Columbia	942	5%	899	9,329	9,229	8,733
Prince Edward Island	795	4%	768	14,493	14,493	4,782
Manitoba	604	3%	552	8,851	8,849	6,195
Alberta	348	2%	338	2,745	2,745	3,870
Newfoundland and Labrador	170	1%	165	1,177	1,006	987
New Brunswick	140	1%	132	1,562	1,559	x
Saskatchewan	95	0%	82	709	635	1,291

Source: Statistics Canada. Table 32-10-0365-01 Area, production and farm gate value of vegetables
x : suppressed to meet the confidentiality requirements of the Statistics Act

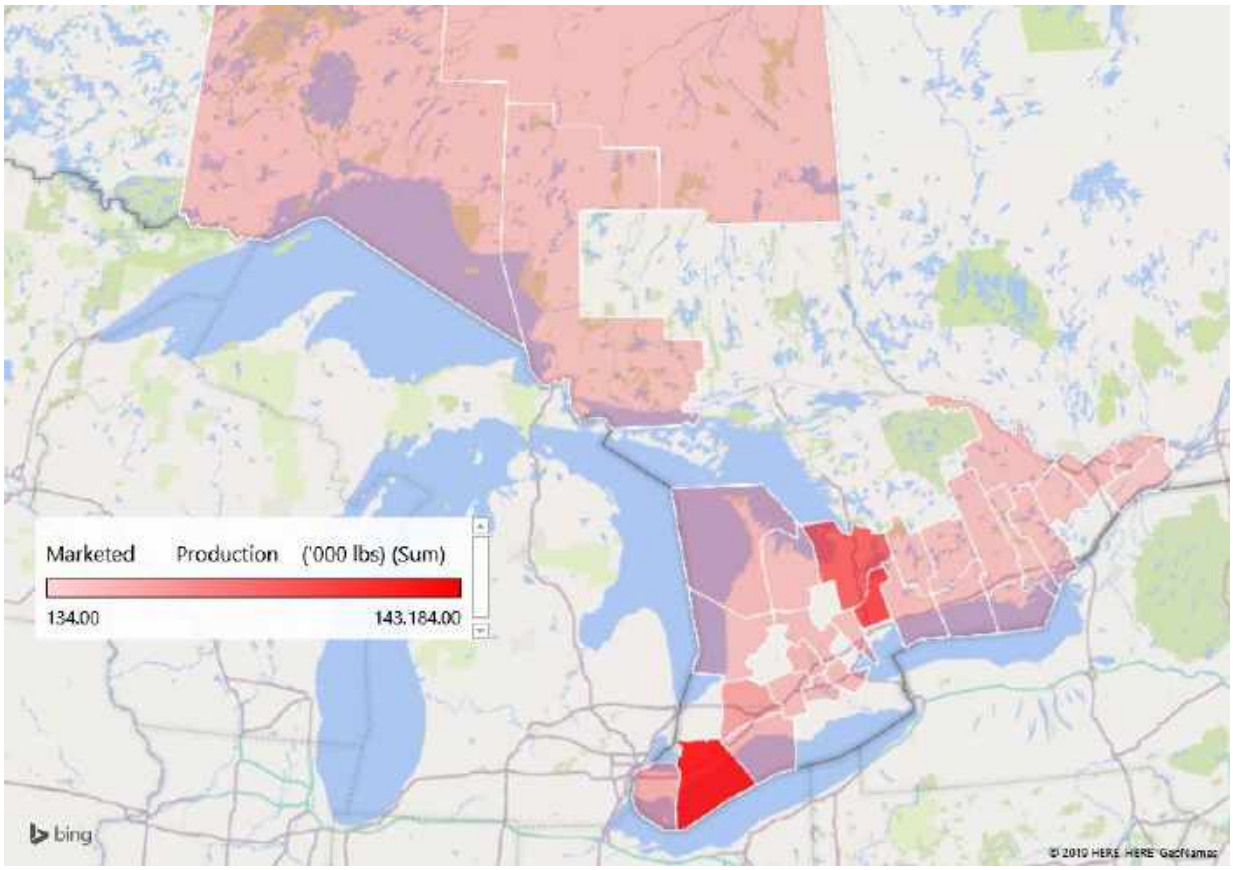
In 2018, Ontario carrot farm gate value was $43.3 million, which generated $83.7 million in economic impact at the farm gate level.[3] In a broader context, the sector generated $15.8 million in labour income, and 405 employment opportunities. In addition, the crop also generated significant additional economic activity from de-dirting, rinsing, packaging, processing

$83.7M in Economic Impact
405 jobs created
$15.8M in Labour Income

[1] Statistics Canada. Table 32-10-0365-01 Area, production and farm gate value of vegetables
[2] Statistics Canada. Table null Vegetables (excluding greenhouse vegetables)
[3] Calculated based on Input-Output Multipliers for crop production in Ontario

and distribution. Building on a Take It Up Consulting report, it is estimated that fresh carrots contributed $70 million to the economy, and processing carrots contributed $24 million.[4] Of course, carrots are grown in rotation with other crops such as onions, so the combined economic impact and job creation are much higher.

Within Ontario, 82% of Ontario carrots are grown in Chatham-Kent, York, and Simcoe.[5] Holland Marsh, consisting of Simcoe and York, is well known for fertile muck and mineral soils that produce almost 50% of fresh carrots in Ontario.[6] However, carrot acreage on highland or mineral soil is rapidly growing and almost matching muck production.[7] In addition to high yields, the soil texture in the Holland Marsh areas is very conducive to carrots because it does not mark or scar the carrots when they are pulled form the ground during harvest. These high quality intact carrots will store longer than carrots produced in other soils, such as more sandy soils in Norfolk county or Chatham-Kent county. Carrots are typically stored for 6 to 7 months from October or November until March or April. With new storage technologies, carrots can be stored for up to 10 months. Longer storage time means the producers/packers can ship fresh carrots to customers for a longer period each year.

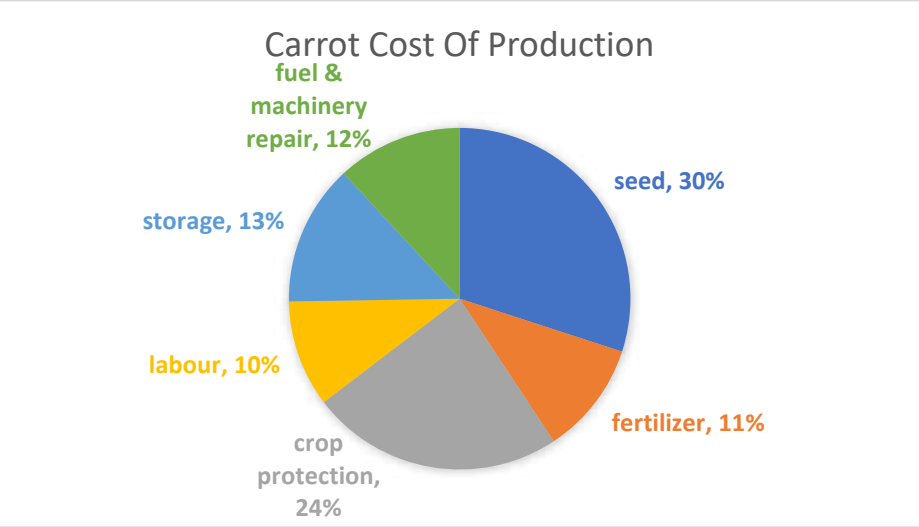


Source: Ontario Ministry of Agriculture and Rural Affairs, 2018

[4] Take It Up Consulting (2019) Holland Marsh Profile of Horticulture
[5] Ontario Ministry of Agriculture and Rural Affairs (2019) Carrots: Area, Production and Farm Value by County and District, Ontario, 2018
[6] Take It Up Consulting (2019) Holland Marsh Profile of Horticulture
[7] Agriculture and Agri-Food Canada (2017) Crop Profile for Carrot in Canada, 2015.

The Chatham-Kent area is the other major production area in Ontario. This area has the benefit of a longer growing season, however storage time is shorter for carrots from this region due to the soil texture. Carrots in this area are produced for both the fresh market as well as for processing. Processing carrots are washed, peeled and cut at time of harvest and frozen using an individual quick freeze (IQF) system.

Carrot is a high input crop in comparison to grains and oilseeds, however is a profitable and high value crop for Ontario growers. By estimate, the largest portion of carrot cost of production is seed (30%), followed by crop protection (24%), storage (13%), and fuel & machinery repair (12%). A typical crop rotation includes carrot every 2 years on muck soil and every 3 years on mineral soil. In the Holland Marsh, carrots are often rotated with onions or other vegetable crops. On mineral soil, corn or soybean can be added to the rotating mix.

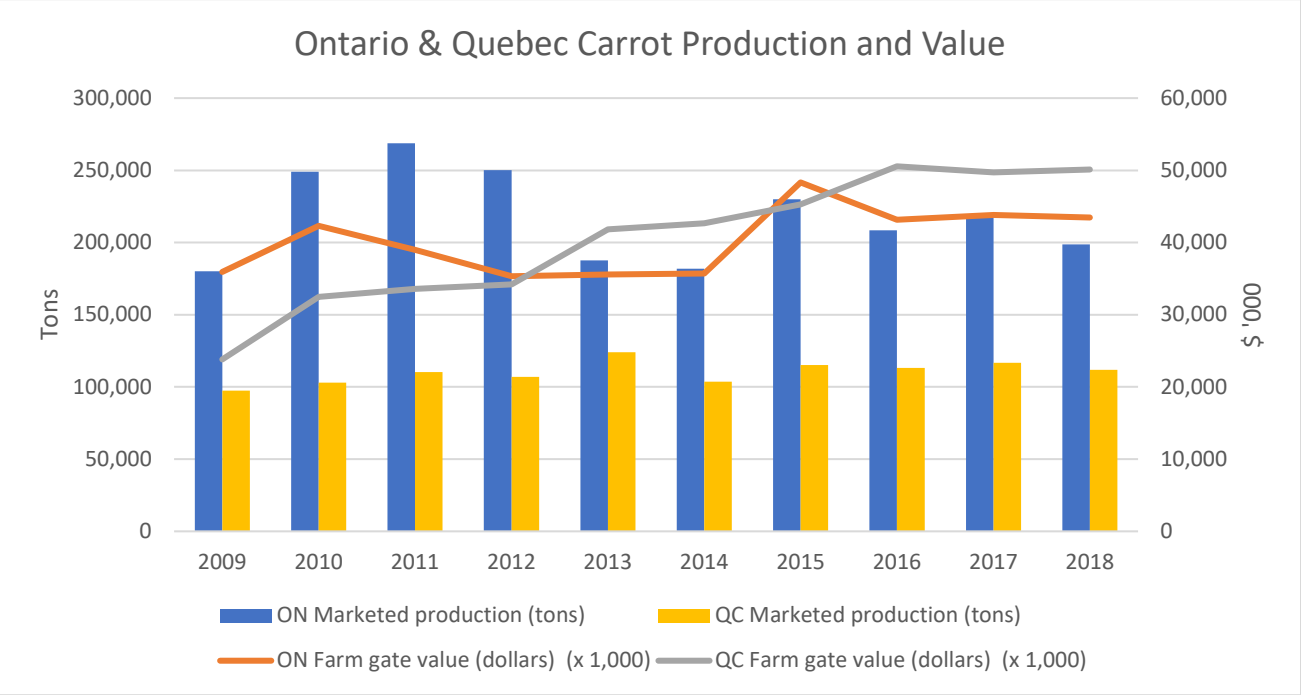


Source: OMAFRA, industry estimates

Source: Holland Marsh Growers' Association

Source: The Grower

Over the last decade, Ontario carrot production and farm gate value have been relatively stable with some fluctuations. In 2018, Ontario marketed 198,674 tons of carrots, valued at $43 million. Compared to Quebec, Ontario produces much larger output, however with a lower farm gate value. Our investigation concluded that Quebec has a higher level of vertical integration as the growers are also packers. Therefore, Quebec farm gate value reported includes processing which takes up approximately half of the total value received.



Source: Statistics Canada. Table 32-10-0365-01 Area, production and farm gate value of vegetables

Vegetable farms in Ontario are a mix of growers and grower-packers, farm operations that also have washing, packaging and storage facilities. The trend in Ontario is toward more grower-packer operations as well as some large operators who have expanded outside of Canada to better serve their customers throughout the year. Growers and packers also invest millions of dollars in storage facilities for better air circulation, temperature and humidity control, in order to retain crop quality and improve energy savings.

Source: Holland Marsh Growers' Association

Competitive Market

The carrot market can be characterized as a highly competitive North American market that is dominated by big players on both the production and customer side. Ontario vegetable farmers are to some extent "squeezed" between these two forces.

The largest competitors for Ontario carrot growers are a few super-large US farms that are vertically integrated and dominate the market. Grimmway, Bolthouse and Kern Ridge are three of the largest carrot growers in US, with growing areas across multiple states. Benefiting from optimal growing conditions and lower input prices, these highly integrated farms can offer year-round supply and diverse product lines with different cuts, snacks, and juices.

"Grimmway Farms is the largest grower, producer, and shipper of carrots in the world. It is headquartered in Bakersfield, California, and has been family owned and operated for more than 40 years. Grimmway Farms handles **10 million pounds of carrots a day** and grows over **40,000 acres** of carrots. Today, Grimmway Farms produces more than 135 seasonal and year-round products distributed worldwide. We are proud to grow 100% of our produce in the USA."
– Wikipedia, Grimmway Farms website

"Bolthouse Farms, founded 1915 in Grant, Michigan, is a vertically integrated farm company specializing in refrigerated beverages. Now located in the San Joaquin Valley of California and is headquartered in Bakersfield, California in Kern County."
– Wikipedia
$689 M revenue, farm 35,000 acres in 2012
Ship 35,000 tons /month in 2015

"In the carrot industry for over 35 years, Kern Ridge Growers is a year-round shipper of California carrots, supplying us 52 weeks of the year, rain or shine. Our carrots are harvested with a four-row Vogel Carrot Harvester, with a volume of up to **150,000 pounds of carrots per hour** in almost any type of soil condition."
– Kern Ridge website

Similarly, on the customer side the grocery retail market is dominated by a few large companies who have purchasing power and the ability to easily import US product. For example, pricing typically drops as soon as the Ontario harvest begins due to the increased Ontario supply and lower freight costs compared to California produced carrots. The food service market also has large players who can readily import product from California.

Sales channels for carrot and other fresh vegetables are well established. Many grower/packer operations are multi-generation farms with long established customer relationships. Finding customers or gaining access to a new sales channel is a challenge for packers and also limits the ability of new entrants to reach customers.

Supply and Disposition

Of all fresh and chilled carrots supplied in Ontario, 82% were produced in Ontario and 18% were imported. Of all fresh and chilled carrots used in Ontario, 72% were domestic use and 28% were exported.

Baby carrots gained popularity in the late 1990s for their convenience. These cuts of undersized carrots or pieces of larger carrots are washed, pre-packaged, and ready to eat, making them a preferred choice for busy lifestyles. Generally grown from selected cultivars at high density, baby carrots are not considered processed due to minimal change from the actual carrot.[8]

Baby carrot import represents half of Ontario import of fresh and chilled carrots, or 9% of total supply. Of all carrot supply in Ontario, 6% comes from baby carrots imported for retail and 2% comes from baby carrots imported for food service.

Ontario Carrot Supply Breakdown 2018

Source: Statistics Canada, 2019 (calculation based on weight)

[8] Agriculture and Agri-Food Canada (2017) Crop Profile for Carrot in Canada, 2015.

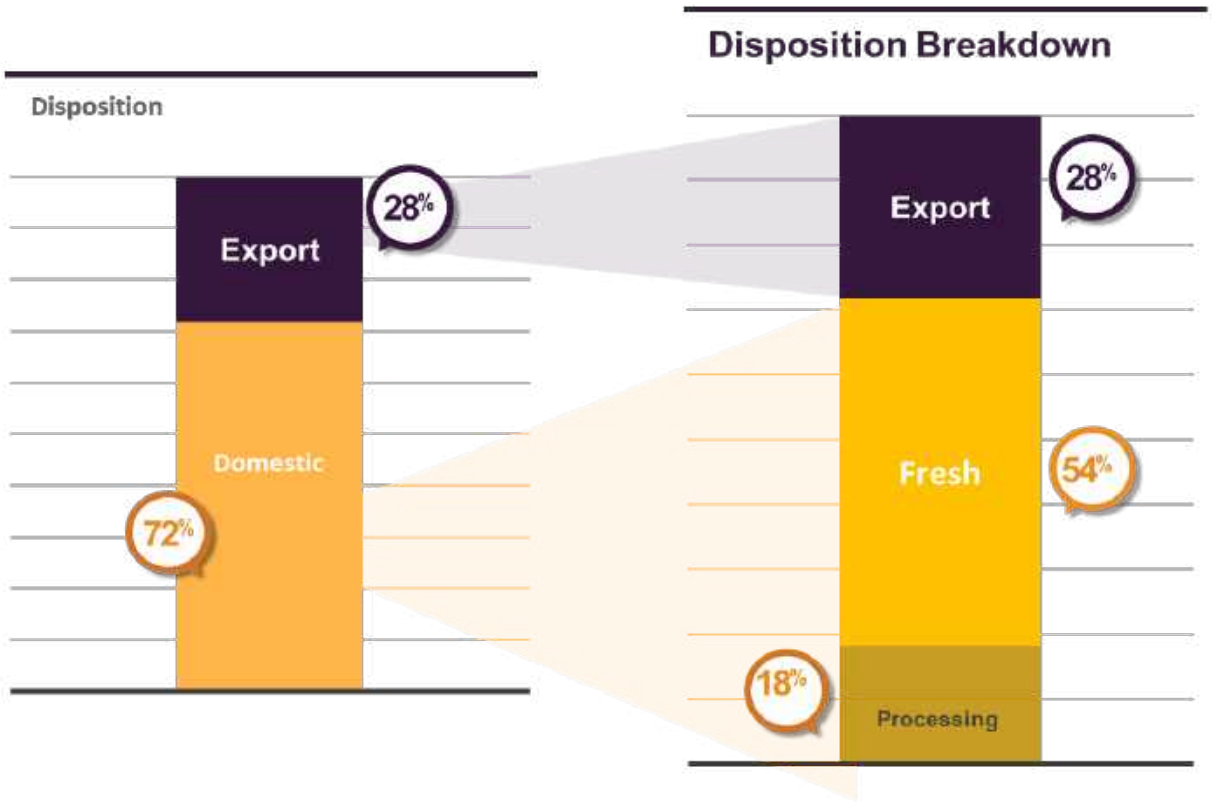
Carrots are grown for fresh market and processing. Fresh carrots are available as “bunched” (with tops) or “topped” (without tops). Cello packs are commonly seen in grocery stores and jumbo carrots are mainly sourced by food service providers. Baby carrots and bunched carrots take up a much smaller share in Ontario production. There is also some interest in multicoloured “heirloom” carrots as a niche market.

Source: Gwillimdale Farms

Source: Holland Marsh Growers’ Association

The carrot market can be broken down as follows: 28% is exported, 54% is sold domestically as fresh and 18% goes to processing such as canning and freezing.

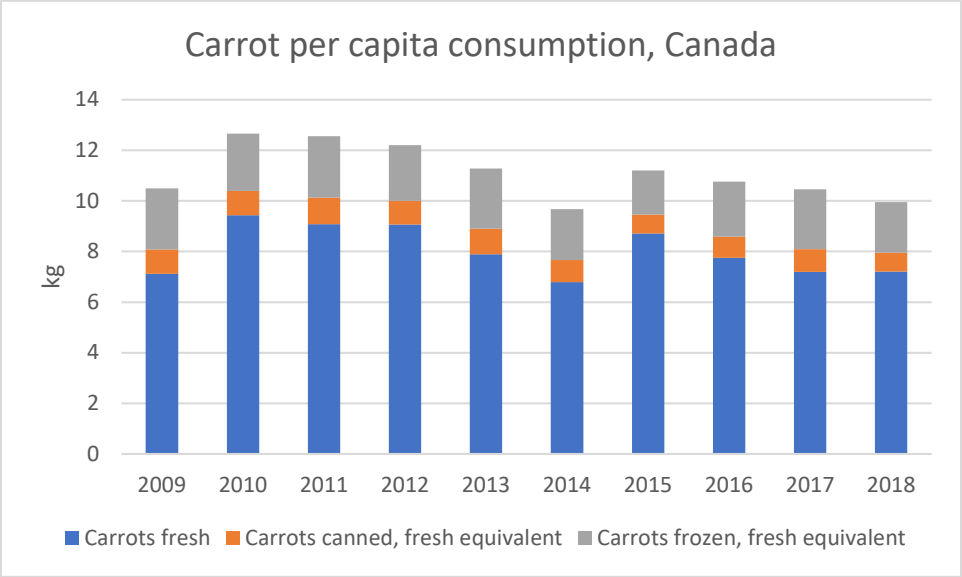
Ontario Carrot Disposition Breakdown 2018



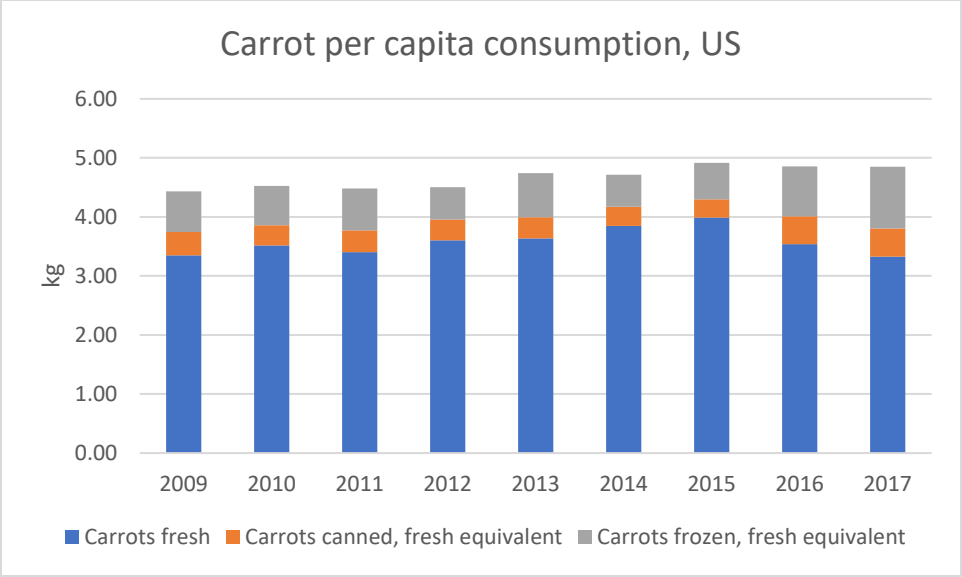
Source: Statistics Canada, Ontario Processing Vegetable Growers, 2019

Consumption

An average Canadian consumes 7.21 kg of fresh carrots a year, in addition to 2.74 kg of fresh equivalent of frozen and canned products. In comparison, an average American consumes only 3.33 kg of fresh carrots a year, in addition to 1.52 kg of fresh equivalent of frozen and canned products. The consumption trend in both countries has remained stable in the last decade.



Source: Statistics Canada. Table 32-10-0054-01 Food available in Canada



Source: Calculated by ERS/USDA based on data from various sources Data last updated Feb. 1, 2018.

By estimate, Ontarians consume a total of 142,511 tonnes of carrots per year (fresh and fresh equivalent of processed products). An additional 14,822 tonnes of fresh carrots are exported to other provinces for

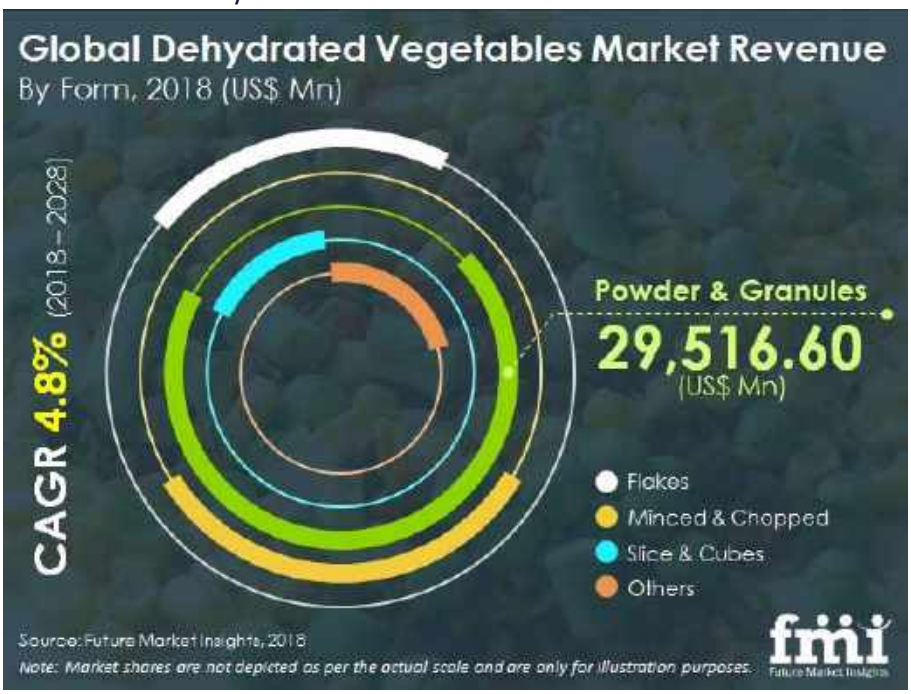
consumption or processing. However, Ontario does have a deficit of processed carrot products, importing 5,236 tonnes from the rest of Canada, and 636 tonnes internationally.[9]

Market Trends

Driven by increasingly health-conscious consumers, the global fruit and vegetable juice market is forecasted to benchmark $173 billion USD by 2024, with a 3.2% CAGR (Compound annual growth rate).[10] A notable trend is the rise of fortified juices that offer functional ingredients such as Omega-3, fiber, bioactive compounds, vitamins, and probiotic bacteria. Popular vitamins added to fruit and vegetable juices include Vitamin D, vitamin E, vitamin A, and vitamin C. Rich in beta carotene, Vitamin C, Vitamin K, potassium, other vitamins and minerals, and dietary fiber, carrot has long been a favoured ingredient in fruit and vegetable juices. As consumers move away from classic flavours like orange juice, towards new and innovative flavours, carrot is becoming a popular ingredient that is naturally sweet, lowers added sugar, and adds vitamins, minerals, and antioxidants.

Ruby juice made from grapefruit, carrot, beet and ginger
Source: Parasadcafe Instagram

Dehydrated vegetable powder is another trend observed in the whole food movement. By 2028, the global dehydrated vegetable market is projected to reach $90 billion USD.[11] Vegetable powders offer versatility in food manufacturing, longer shelf life, and high levels of vitamins and minerals. Using technologies like air, vacuum, and freeze drying, dehydrated food powders are now preserved with better color, flavour, and nutrition. On the consumer side, vegetable powders capitalize on busy lifestyles and demand for convenience and ready-to-eat foods.



[9] Ontario Ministry of Agriculture and Rural Affairs
[10] Mordor Intelligence FRUIT AND VEGETABLE JUICE MARKET - GROWTH, TRENDS, AND FORECAST (2019 - 2024)
[11] Future Market Insights (2018) Dehydrated Vegetables Market: Long Shelf Life of Products Spurring Revenue Growth: Global Industry Analysis (2013 - 2017) & Opportunity Assessment (2018 - 2028)

Individual Quick Freezing (IQF) can be a growth opportunity as well. Compared to conventional freezing technologies, IQF preserves better flavor, texture, and nutrition. Growing at 2.2% CAGR, the global IQF vegetables market is expected to expand from $720 million USD in 2019 to $820 million USD by 2024.[12] North America marks over 40% of the global market share, while developing countries are catching up with rising income and increasing preference for frozen food.

Source: Bonduelle

Innovative packaging is also sought after by consumers. Creativity, freshness appeal, temptation and convenience in packaging draw attention of consumers globally. As snacking becomes increasingly prominent, smaller portion packaging that is ready-to-go are gaining traction.

Source: Euromonitor

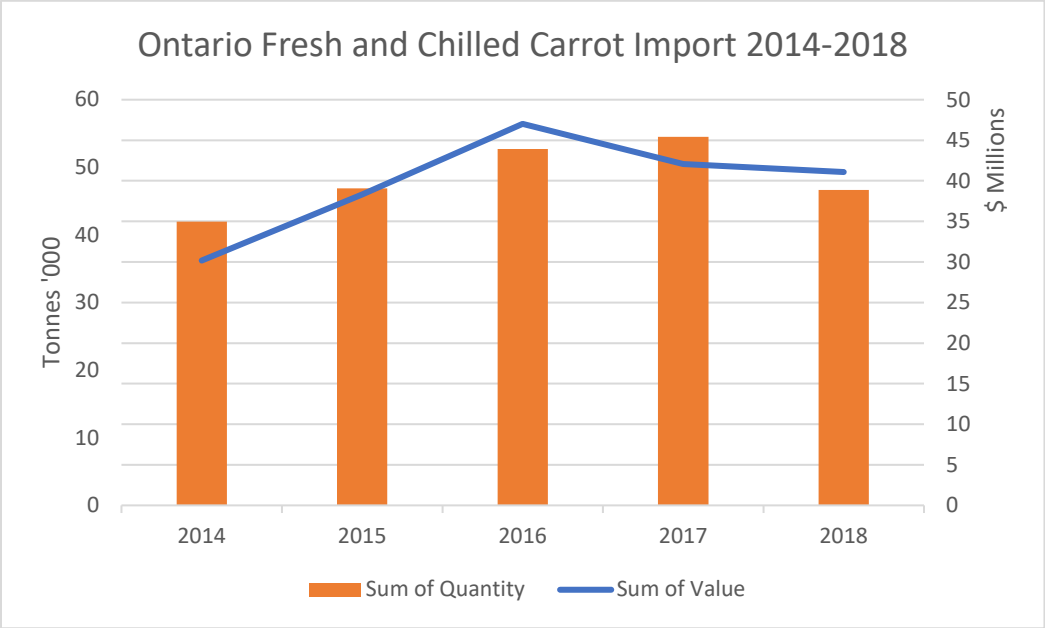
[12] 360 Research Reports (2019) GLOBAL IQF VEGETABLES MARKET GROWTH 2019-2024

Trade

Although a net carrot exporter in quantity, Ontario shows a trade deficit in value. In 2018, Ontario registered a net trade balance of 22,900 tons, and a $3.9 million trade deficit in value. A comparison of average price revealed that Ontario exports receive only 58% of the price paid for imports, a gap largely due to the higher pricing of imported baby carrots.

Import

Ontario carrot import has been steadily increasing with a drop in quantity and value in 2018.



Source: Statistics Canada, 2019

The top five origins of Ontario carrot import are United States, Mexico, China, Israel, and interprovincial trade. US alone accounts for 76% of Ontario import, while Canadian products re-imported from US account for 0.2%. Within US, the majority of carrot import originates from California (71%) and Georgia (19%).

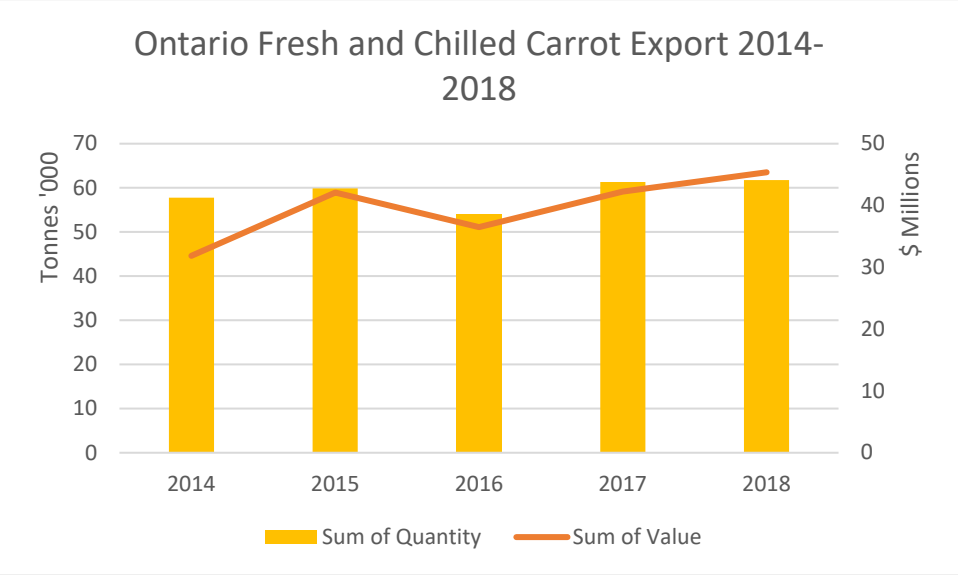
Country of Origin	Percent of import
United States	76.1%
Mexico	19.2%
China	2.7%
Israel	1.6%
Canada (re-imported from US)	0.2%

Source: Statistics Canada, 2019

State of Origin in US	Percent of import
California	71.3%
Georgia	18.9%
Texas	2.5%
Washington, State	1.8%
Arizona	1.8%

Export

Ontario carrot export has been increasing in the past five years in both quantity and value, despite a slight setback in 2016.



Source: Statistics Canada, 2019

Over 99% of Ontario carrot export ship to US, with the rest shared among Caribbean countries. Within US, the top five states of destination are Florida, New York, Illinois, Pennsylvania and New Jersey.

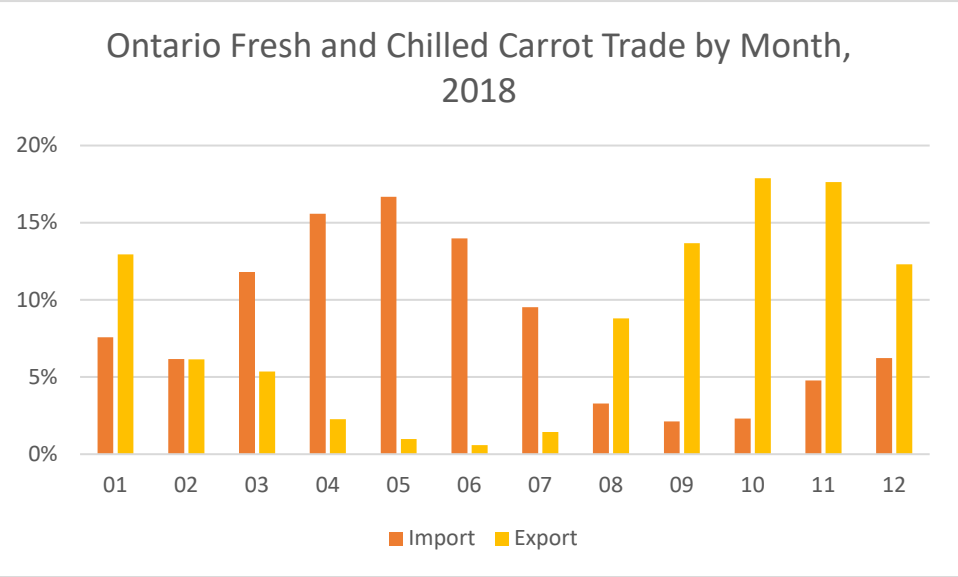
Country of Destination	Percent of Export
United States	99.65%
Barbados	0.28%
Trinidad and Tobago	0.04%
Bahamas	0.01%
Cuba	0.01%

State of Destination in US	Percent of Export
Florida	17.2%
New York	14.7%
Illinois	10.1%
Pennsylvania	9.1%
New Jersey	7.7%

Source: Statistics Canada, 2019

Seasonality

One of the biggest challenges for Ontario growers compared to US growers is winter. In Ontario, carrots are planted in May and June and harvested August through November. By putting import and export together, it is clear that given the seasonality of Ontario carrots, import is strong from March to July, and export picks up from August to January. This confirms our observations from the interviews that domestic stock runs out between March and June. The Ontario business model is storage after harvest and supplying through early spring, while the US business model benefits from the much longer growing season and year-round supply from California.



Source: Statistics Canada, 2019

Source: Holland Marsh Growers' Association

Observations

Source: Holland Marsh Growers' Association

- Seasonality is a limiting factor
    - The seasonality of Ontario production means that grocery stores purchase from US suppliers who can supply a consistent product year-round
    - Once Ontario production becomes available at harvest, grocery stores generally start purchasing local product as seen in the reduction of carrot imports (see chart on page 13)
    - However, the prices paid by grocery stores drop as soon as Ontario harvest starts (because of the lower transportation costs and the nature of the competitive marketplace).
- Highly Competitive Market
    - US growers have competitive advantages such as optimal growing conditions, lower input costs, and year-round supplies
    - Retail and food service companies have purchasing power and easy access to US supply
- High quality land is a limiting factor
    - Muck and mineral soils in the Holland Marsh area produce high quality carrots with a long shelf life, but growth is limited by land availability
    - However, land is not a limiting factor for processing carrot production, which does not require storage
- Overall consumption not likely to increase dramatically
    - Canadian per capita consumption is trending down over the past few years. US per capita consumption is less than half of the Canadian average, thus we cannot expect much overall market growth.
    - However, there are several growth opportunities:
        - Canada's Food Guide recommends eating a variety of vegetables and fruits that fill half of your plate, which should stimulate some growth in the market.
        - New innovative products like carrot juice and further processed producers (de-hydrated powder, shredded, sliced, etc.) do offer growing opportunities to meet consumer demand for convenience.
- Baby carrots not likely a significant growth opportunity (due to competitive factors)
    - Our interviews with growers and industry experts concluded that although baby carrots create significant value-added processing, Ontario is not in a position to compete with California, which has a very efficient production method, lower input costs and no seasonal restrictions.
    - Large US farms can supply fresh product all year and produce two or more crops per year on the same land, which is a huge competitive advantage.
    - Some Ontario growers already supply large size carrots to the US market for further processing into baby-cut carrots.
    - There are already 2 locations in SW Ontario (Derewlany, Thorndale and Bolthouse, Wheatley) that process baby-cut carrots.

Opportunities

- Light Processing / Value Added is an opportunity
    - Minimally processed/fresh cut products have increased in the past 10 years as restaurants and foodservice look to minimize in-house labour by purchasing pre-prepared vegetables. This industry tends to locate close to urban centres where most of the demand is.
    - However only a small amount of minimally processed/fresh cut products is exported, given the importance of fresh delivery.
- Exports to Northeast United States is an opportunity
    - Exporters have had some success in shipping to a few Northeast states and the Great Lakes region, such as New York, Illinois, Pennsylvania and New Jersey. This market appears to be a growth opportunity for both fresh and processed product, due to its proximity to Ontario ports of exit.
- IQF Processing is a growth opportunity
    - North America takes up 40% of global frozen vegetables market. Although production on muck is limited for the fresh market, there is still potential in expanding processing carrot production.
    - IQF is worth exploring to better retain flavor, texture, and nutrition of vegetables
- Storage technology worth investigating
    - Our analysis of the monthly trade data demonstrated that imports are highest in spring and early summer, when domestic stock runs out and new harvest is yet to begin.
    - We recommend exploring the opportunity of better storage for spring/summer, especially with muck soil crop from the Holland Marsh which offers good keeping quality.
- Improve crop production
    - In Holland Marsh where land availability is limited for the fresh market, it is important to improve production potential in terms of crop protection and seed innovation.

Source: Holland Marsh Growers' Association

Appendix

Ontario Carrot Value Chain Infographic

Ontario Carrot Production by County

Carrots: Area, Production and Farm Value by County and District, Ontario, 2018					
Counties and Districts	**Harvested Area (acres)**	**Average Yield ('000lbs/acre)**	**Marketed Production ('000 lbs)**	**Average Price (cents/lb)**	**Farm Value ($'000)**
Brant	5	47.0	235	10.8	25
Chatham-Kent	3,040	47.1	143,184	10.7	15,321
Elgin	91	46.8	4,259	11.5	490
Essex	290	46.1	13,369	10.8	1,444
Haldimand-Norfolk	295	47.5	14,013	11.7	1,640
Hamilton	25	47.1	1,177	10.8	127
Middlesex	457	46.6	21,296	10.7	2,279
Oxford	21	47.4	995	11.6	115
Other	44	47.0	2,068	10.8	223
Southern District	**4,268**	**47.0**	**200,596**	**10.8**	**21,664**
Bruce	65	47.5	3,088	12.2	377
Grey	6	47.5	285	10.9	31
Huron	5	47.5	238	10.9	26
Peel	4	47.5	190	10.9	21
Simcoe	1,641	47.6	78,112	10.8	8,436
Waterloo	105	46.1	4,841	11.7	566
Wellington	11	45.7	503	10.8	54
Other	9	47.5	428	10.9	47
Western District	**1,846**	**47.5**	**87,685**	**10.9**	**9,558**
Durham	19	46.4	882	10.9	96
Hastings	13	46.4	603	10.8	65
Kawartha Lakes	6	46.4	278	10.9	30
Northumberland	7	46.4	325	11.0	36
Peterborough	8	46.4	371	11.0	41
Prince Edward	6	46.4	278	10.9	30
York	2,234	46.4	103,658	10.9	11,299
Other	4	46.4	186	10.9	20
Central District	**2,297**	**46.4**	**106,581**	**10.9**	**11,617**
Frontenac	4	45.0	180	12.5	23
Lanark	3	45.0	135	12.5	17
Leeds & Grenville	6	45.1	271	12.9	35
Lennox and Addington	3	45.0	135	12.5	17
Ottawa	17	44.9	763	12.4	95
Prescott and Russell	11	45.2	497	12.0	60

Renfrew	4	45.0	180	12.5	23
Stormont, Dundas and Glengarry	3	44.8	134	12.8	17
Eastern District	**51**	**45.0**	**2,295**	**12.5**	**287**
Algoma	4	44.9	180	12.8	23
Cochrane	6	44.9	269	12.8	34
Greater Sudbury / Grand Sudbury	6	44.9	269	12.8	34
Thunder Bay	12	44.9	539	12.9	70
Other	8	44.9	359	12.8	46
Northern District	**36**	**44.9**	**1,616**	**12.8**	**207**
Province	**8,498**	**46.9**	**398,773**	**10.9**	**43,333**
* Includes baby carrots					
Note: The above are estimates by OMAFRA, not a product of Statistics Canada					
Reference: Fruit and Vegetable Production and 2016 Census of Agriculture, Statistics Canada					
24 October 2019					

Source: Ontario Ministry of Agriculture and Rural Affairs

Ontario Processing Carrot Statistics

	2013	2014	2015	2016	2017	2018	2019p
Number of Contracts	16	15	16	16	15	15	10
Tons Contracted	56,403	43,619	49,450	53,594	52,093	44,639	43,190
Tons Harvested[1]	41,863	46,085	44,443	50,772	52,776	40,080	
Gross Farm Value (,000)	$5,153	$5,898	$5,887	$7,024	$6,803	$5,928	

[1] Tonnage reported by crop year (June 24 - June 23)
P = Preliminary
Source: Ontario Processing Vegetable Growers

Ontario Licensed Processors for Carrots 2019

BONDUELLE ONTARIO INC.
P.O. BOX 176
583278 HAMILTON ROAD
INGERSOLL, ONTARIO N5C 3K5
TEL: (519) 485-4410
FAX: (519) 485-1321

BONDUELLE ONTARIO INC.
225 LOTHIAN STREET
STRATHROY, ONTARIO N7G 3J2
TEL: (519) 245-4600
FAX: (519) 245-3661

BONDUELLE ONTARIO INC.
P.O. BOX 3220
1192 LACASSE BOULEVARD
TECUMSEH, ONTARIO N8N 2M4
TEL: (519) 735-2111
FAX: (519) 979-5711

LAKEVIEW VEGETABLE PROCESSING INC.
Box 144
QUEENSVILLE, ONTARIO LOG 1R0
TEL: (905) 478-4739