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Incorporating producer opinions into a SWOT analysis of the U.S. tart cherry industry

RESEARCH ARTICLE

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Abstract

While SWOT analysis is common in strategic management, the academic literature rarely incorporates responses and opinions held by those within the industry of interest. This article contributes to the agribusiness literature by identifying the strengths, weaknesses, opportunities, and threats for the tart cherry industry and surveying stakeholders to integrate their feedback into the analysis. Results indicate that producer views on the strengths, weakness, opportunities and threats of the tart cherry industry are heterogeneous. Results also suggest that growers perceive consumer interest towards nutritional/healthy and natural food products as the main opportunity for the tart cherry industry, while imports are considered the biggest threat.

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JEL code: C83, Q13

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1. Introduction

The average American consumed fewer than two pounds of tart cherries in 2017 (Cherry Industry Administrative Board, 2018). With a total fruit consumption of 289.3 pounds per capita this amount seems negligible, particularly when looking at similar fruits such as apples, of which each American eats around 17.7 pounds each year (USDA, 2019). While specialty crops like tart cherries may not play a prominent role for the average American consumer, they are often an important part of regional or state economies and identities. For example, Michigan's tart cherry tart cherry growers, processors, and marketers directly and indirectly create significant employment opportunities throughout the value chain (Michigan Department of Agriculture and Rural Development, 2017). In fact, of the total U.S. output from 2016-2017, around 75% stemmed from Michigan producers (Benedetti, 2018).

Tart cherries are a perennial crop generally harvested using mechanical shakers in July, with Montmorency being the most commonly planted cultivar in North America (Jess *et al.*, 2003; Michigan Department of Agriculture and Rural Development, 2017). Given its sweet-tart flavor profile and nutritious properties, tart cherries are widely used in processing and are commonly found in pies, various snacks, and nutritious dietary supplements. Tart cherries can also be found in alcoholic beverages, snack bars, and candies. Despite the enduring popularity of these processed goods, changing consumer preferences have the potential to threaten the current version of the tart cherry value chain. Furthermore, Turkish tart cherry imports have increased their market share within the U.S. market, further jeopardizing the future of domestic production.

Understanding the emerging issues confronted by the tart cherry industry of critical importance. Despite this importance, few peer-reviewed studies have focused on the tart cherry value chain. Thus, the primary objective of this article is to provide a snapshot of the tart cherry industry. Specifically, we explore the strengths, weaknesses, opportunities, and threats currently confronted by the tart cherry industry via secondary and primary data. We seek to contribute to the literature of agribusiness supply chain analysis in two ways. First, we document the organizational flow of tart cherry production, mapping out the diverse actors involved. Second, we integrate producer survey data into a Strengths, Weakness, Opportunities and Threats (SWOT) analysis. SWOT analysis are used to guide industry discussions on potential investments, research agendas, and policy. However, they are generally conducted with limited input from producers within the industry of interest (Carrà *et al.*, 2016). In this regard, this article represents a unique contribution as growers are surveyed to elicit their opinions regarding the long-term viability of the industry. This inclusive method provides a more conversational opportunity for the development of a long-term relationship between land grant universities, cooperative extension, and industry groups.

The remainder of this article is organized as follows. The next section categorizes key portions of the tart cherry supply chain. The third section presents a SWOT analysis of the tart cherry industry, including industry members' perspectives. The final section discusses implications for the tart cherry industry.

2. The tart cherry supply chain

Supply chain analyses are often used to assist in identifying potential growth areas for an industry by categorizing key steps along a product's life cycle. Previous studies have analyzed food supply chain issues spanning innovation and competitiveness in meat production (Fernandes *et al.*, 2019), cooperatives in pork (Jia *et al.*, 2017), socioeconomic impact of dairy management practices (Wane *et al.*, 2017), and vertical integration in the Brazilian orange juice sector (Ito and Zylbersztajn, 2018). Figure 1 illustrates how American-grown tart cherries move through the U.S. supply chain.

The Cherry Industry Administrative Board (CIAB) was formed in 1996 to administer the industry's marketing order. CIAB operates under the oversight of the U.S. Department of Agriculture and is authorized by federal law. The main purpose of CIAB is to increase U.S. tart cherry grower and processor profitability. CIAB serves primary suppliers in the market such as growers, first stage processors, and remanufacturers.

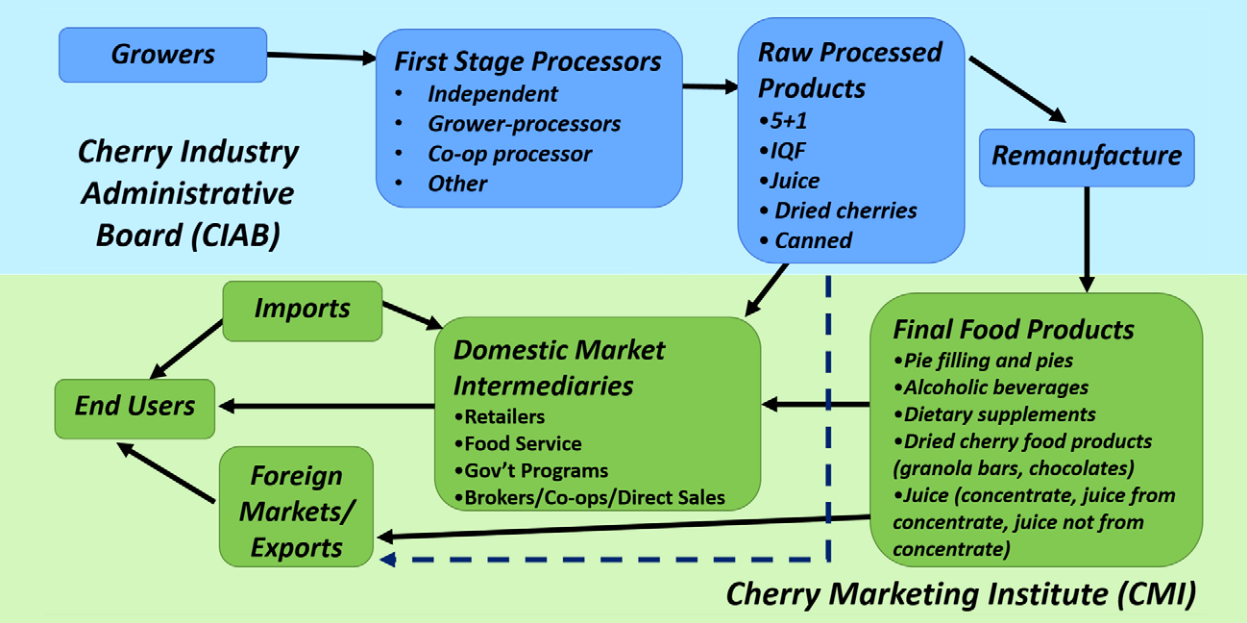

Figure 1. The tart cherry supply chain.

Moreover, CIAB seeks to facilitate long-term stability in the industry by equalizing annual production and consumption of tart cherries. Through storing inventory, the CIAB minimizes severe price fluctuations across years. Furthermore, the CIAB regulates the product flow to different processing paths easing surpluses and shortages. Despite these objectives, shortages can still occur. The lowest production of tart cherries over the existence of the CIAB occurred in 2002-2003, caused by a 'one-hundred-year weather event when nearly all of the tart cherries were lost in a wind freeze' (Rothwell *et al.*, 2015: 3). A similar weather-related loss occurred in 2012 when only 141 million pounds of tart cherries were produced.

Michigan produces 189.2 million pounds of tart cherries, followed by Utah with 26 million pounds, Washington with 25 million pounds, Wisconsin with 11.3 million pounds, and New York with 7.8 million pounds (USDA, 2018b). The well-drained, loamy sand and climatic conditions necessary for growing tart cherries provide Michigan's comparative advantage. Lake Michigan makes western Michigan especially suited for producing tart cherries as the lake's moderating effect on temperatures traditionally results in longer and frost-free autumns and a delayed spring bloom period (Jess *et al.*, 2003). Consequently, there are approximately 425 tart cherry growers in the state of Michigan (Benedetti, 2018).

In 2010, 97% of the tart cherries grown in the United States were processed (USDA, 2018a). Independent processors, grower-processors, and co-op processors use the raw tart cherries to make raw processed products (Martinez and Thornsbury, 2006). Although processors are significant players in the tart cherry supply chain, only limited research has focused on the production characteristics desired by processors. For example, Gallardo *et al.* (2015) found that tart cherry processors were willing to pay a premium for external red color, good pit removal, and uniform size.

Tart cherries are prone to diminishing quality and spoil when stored (Black, personal communication; Martinez and Thornsbury, 2006). Therefore, initial processing generally occurs imminently following harvest. Processors produce multiple outputs including five-plus-one packs (5+1)[1], individually quick frozen (IQF), canned cherries, dried cherries, and concentrated juice (Cherry Marketing Institute, 2019). In addition, processors sell frozen, canned-pie fill, dried, canned-water packs, and frozen juice concentrates as ingredients for final food products. The total production of frozen products such as 5+1 and IQF during

[1] The tart cherries are packaged in a container capped with sugar at a rate of one (1) pound of sugar for each five (5) pounds of cherries.

a typical year in Michigan, is approximately 68.1 million pounds and 19.5 million pounds respectively. Processors sometimes sell directly to retail outlets, food services, government programs and other product outlets such as brokers, cooperatives, and domestic market intermediaries, but most raw processed goods are marketed to remanufacturers. Moreover, nearly two-thirds of raw processed cherries are remanufactured, which transforms raw processed products into edible foods (Martinez and Thornsbury, 2006).

The low sugar content and high acidity of tart cherries make them a key ingredient for baking, cooking, and drying. Tart cherries are used in multiple final food products. For example, they serve as an ingredient or intermediate good in snack bars, snack mixes, pastry, and pies. Moreover, tart cherries are consumed in the form of dried tart cherries, juice concentrate, juice made from juice concentrate, and 100% pure tart cherry juice (not from concentrate).

Identifying tart cherry consumers is of critical importance. Thus, in 1988, the industry established the Cherry Marketing Institute (CMI) with the primary goal of increasing demand for tart cherry products t in domestic and international markets. To achieve this goal, the CMI conducts product research with various private and public organizations. CMI is funded through farmer and processor assessments as over half of Michigan processors indicate, 'a need to develop value-added products in forms that consumers prefer, such as ready-to-use packs or healthy desserts, rather than intermediate products' (Thornsbury and Martinez, 2011: 587). At the time, only one tenth of processed tart cherry products were sold as brined, dried, juice, and wine (Martinez and Thornsbury, 2006). Hence, almost half of first-stage processors were expanded their value-added product offerings. The final food products alongside with the raw processed products reach the domestic market through the market intermediaries, as well as export markets.

Domestic market intermediaries include traditional retail outlets, institutions (e.g. hospitals, schools), restaurants, government programs, brokers, and direct sales. Each intermediary provides tart cherry sub-products to end consumers in a unique way. Consumer preferences have adjusted significantly over the past few decades (Conley and Lusk, 2018) and tart cherry demand has not been immune to this transition. Consumer demand has shifted from baked goods (e.g. pie-filling) to various gourmet snack products (e.g. trail mixes, granola bars and cereal) juice, value-added and specialty products, as well as dietary supplements (Gibbons, 2017).

3. SWOT analysis

SWOT analyses are commonly utilized in the strategic management literature to help specify unfavorable and favorable aspects within the decision-making process (Robison *et al.*, 2018). Several studies have employed the framework with agribusiness being a common application area (Ghazinoory *et al.*, 2011). The SWOT framework generally represents a first step toward the development of more accurate marketing strategies (Chagomoka *et al.*, 2014; Heise *et al.*, 2015; Knierim and Nowicki, 2010; Martin-Collado *et al.*, 2013; Morris and Mare, 2013). While SWOT analysis is commonly conducted using existing information from industry groups and businesses, it is rarely combined with primary data collected through stakeholder surveys (Carrà *et al.*, 2016).

3.1 Methods and sample demographics

The SWOT analysis was performed in two steps. First, we identified strengths, weaknesses, opportunities, and threats of the tart cherry industry, as usually performed in the literature. These were then screened by industry leadership. Figure 2 lists the items identified within each SWOT category.

Second, the final SWOT items reported in Figure 2 were used to conduct a survey with tart charry industry stakeholders. For each SWOT category, stakeholders reported which of the items were the most and least important. Stakeholder data was collected in Traverse City, Michigan, during the Northwest Michigan Orchard and Vineyard Show in January of 2019. During a section discussion on marketing, participants

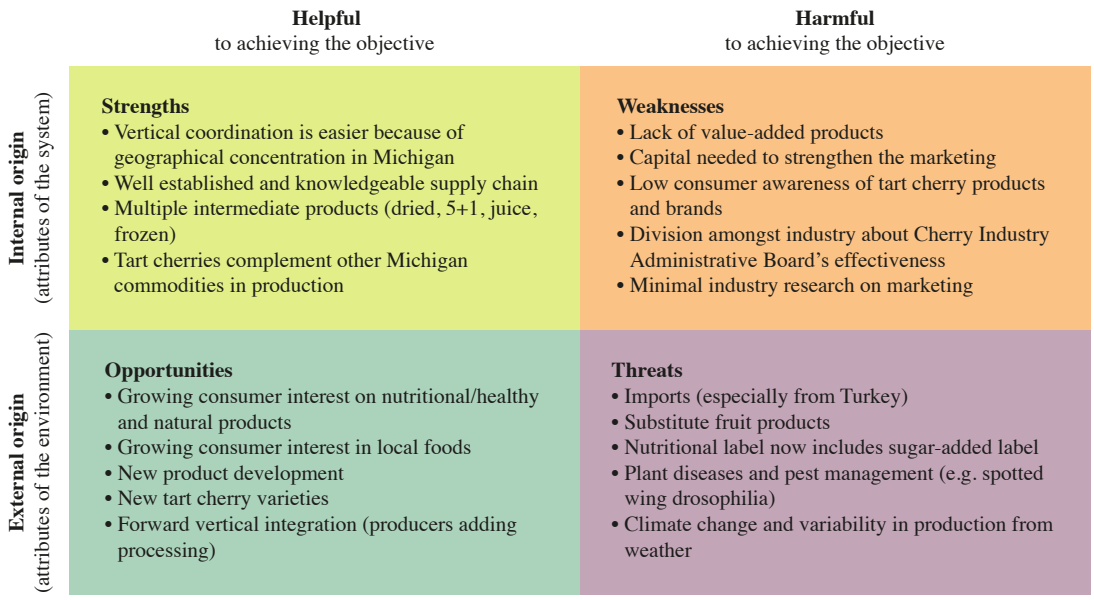

Figure 2. SWOT analysis of the tart cherry industry.

responded via text messages within the Poll Everywhere® mobile software platform (Shon and Smith, 2011). Thirty-seven producers, processors, and other industry members participated in our survey. All participants operate within Michigan. A significant percentage of them (42%) have an operation larger than 200 acres. More than half of the participants dedicate at least 60% of their operation to tart cherries. While more than 25% of our participants only grew tart cherries, more than 50% of participants also grew apples in addition to cherries. Figure 3 displays an example of the question format.

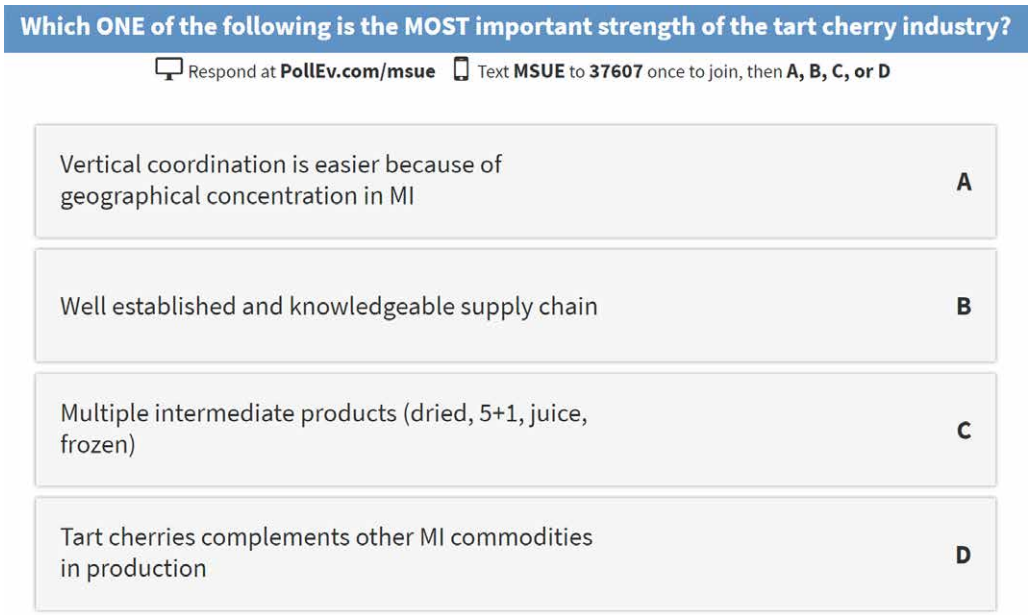

Figure 3. Example of the interactive SWOT analysis question format.

3.2 Strengths

An industry's core competencies and competitive advantages are commonly considered as strengths (Robison *et al.*, 2018). Strengths are viewed as internal industry features that can be controlled. One of the identified strengths for the industry is that vertical coordination could potentially be easier because of the geographical concentration of growers in Michigan. The notion that collective action is easier within smaller groups of people who live within a small geographic proximity has been a fixture in the institutional literature for over half a century (Olson, 1965). Economic theory suggests that the free-rider problem will increase as a group becomes larger due to the value of concentrated benefits versus diffuse costs. Many agricultural commodity groups suffer from these free rider problems (Olson, 1985).

Another strength is that tart cherries can be found in multiple intermediate products (dried, 5+1, juice, frozen). The diversity of product offerings suggest that tart cherry sales are not tied to a single consumer demographic, but rather have the potential to be purchased by many consumers (Thornsbury and Martinez, 2011).

A third strength of the tart cherry industry is the ability of the stakeholders to leverage the fact that tart cherry production complements the production of other staple agricultural commodities. Michigan is the second most diverse agricultural state (Michigan Farm Bureau, 2019). Thus, producers often grow multiple commodities and/or have multiple farm enterprises. Farm enterprise diversification helps to reduce income variability (Robison and Barry, 1987) and mitigates price risk (Mishra *et al.*, 2004). In particular, tart cherries complement the production of asparagus and apples. For example, tart cherries can be grown on hilltops, while asparagus occupies the lower lying areas. Furthermore, tart cherries and apples favor similar topographies, but have consecutive harvest seasons, allowing continuous employment of farm laborers.

Finally, the tart cherry industry has been entrenched in Michigan for more than a century. According to the Cherry Marketing Institute, the first commercial tart cherry orchard and processing facility in Michigan was established in the nineteenth century (National Cherry Festival, 2019). The long presence of the industry in the State can lead the stakeholders to a better understanding of the supply chain, and hence, to better decision-making.

Figure 4 reports the stakeholder views on the most and least important strengths of the tart cherry industry. Participants ranked multiple intermediate products as the most important strength, followed by the well-established and knowledgeable supply chain. Stakeholders believed that the tart cherry's ability to complement other commodities and the streamlined vertical coordination were the least important strengths.

3.3 Weaknesses

An industry's weaknesses are internal factors that put them at a disadvantage (Robison *et al.*, 2018). First, a weakness of the tart cherry industry is the industry division about CIAB effectiveness. While other marketing orders, like the Cherry Marketing Institute (CMI), have been collectively considered very helpful from the stakeholders in increasing demand for tart cherries and identifying the tart cherry consumer, there is some concern regarding grower satisfaction with CIAB, which has drawn criticism since its first incarnation in the 1960's (Ricks, 1983). Most recently in 2014, Burnette Foods filed a lawsuit against CIAB for the restrictions on tart cherry supply (French, 2014). At times, the tart cherry marketing order has received negative press, largely connected to photos of in-orchard diversions (Draplin, 2016; Linnekin, 2016; Matheny, 2016). This is particularly relevant given the recent Supreme Court Decision that ruled against the Raisin Administrative Committee (RAC). Like CIAB, the RAC diverted portions of raisin supplies away from the market to increase and stabilize producer prices (Webster, 2015). While there are differences between the raisin program and the tart cherry program, the Supreme Court case suggests that marketing orders are a less politically palatable industry mechanism than in previous decades (Crespi, 2018). However, it must be noticed that with the increasing volume of imports from Turkey, the effectiveness of any supply control restriction by CIAB is severely diminished. Thus, the need of such measures can be questioned due to the power of global trade.

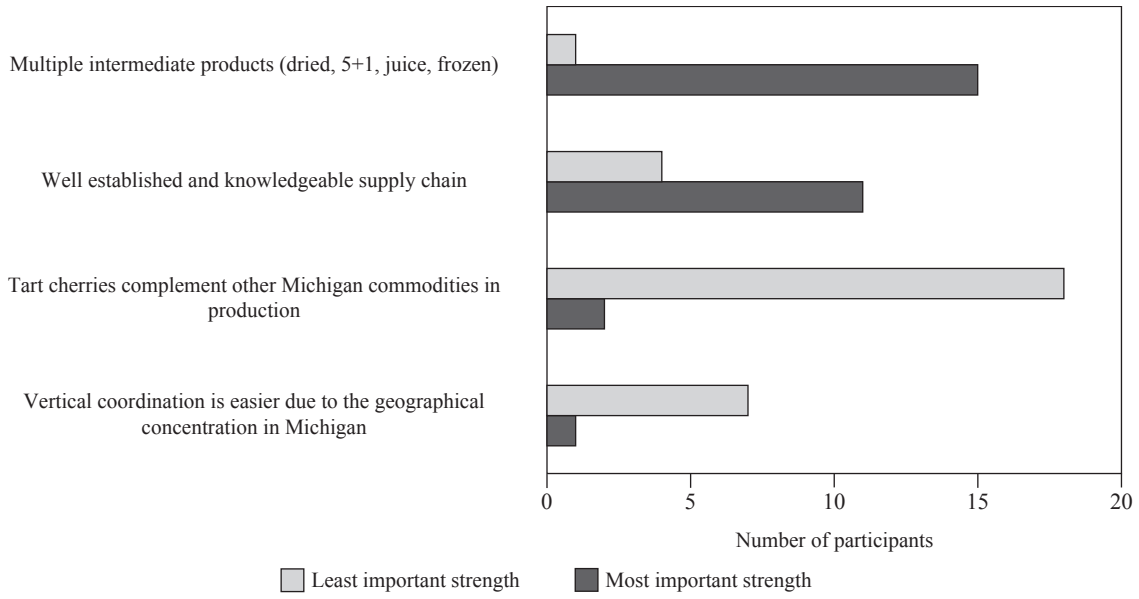

Figure 4. Stakeholder-perceived strengths.

Third, minimal industry reseach on marketing is another potential weakness. Despite significant production volume relative to the rest of the world, only a few studies have explored key stakeholder aspects of the tart cherry market. One of the few exemptions is Lagoudakis *et al.* (2019), who collected data as part of a 2004 collaborative project that profiled fresh Balaton cherry consumers in Michigan.

Additionally, the industry has shown inability in creating and implementing effective marketing strategies. As a result, there is low consumer awareness of tart cherry products and brands. This is exemplified by the low per capita consumption of tart cherries in the United States (Cherry Industry Administrative Board, 2018).

Finally, the lack of added-value products is another weakness found in the tart cherry industry. While newer niche tart cherry firms are vertically integrating into value-added products, but this is not the industry norm (Thornsbury and Martinez, 2011). This is perhaps unsurprising as increasing product offerings and marketing new products is capital intensive.

Figure 5 reports the results from the stakeholder survey. Participants reported the low consumer awareness of tart cherry products and brands as the most important weakness. The weaknesses perceived to be least important were the division amongst the industry about CIAB effectiveness and minimal industry research on marketing. Participants had mixed views on the lack of value-added products; four participants viewed it as the most important weakness, while nine saw it as the least important weakness.

3.4 Opportunities

An industry's opportunities represent the best chances for growth from external factors. Given the competitive and changing forces in the industry environment, opportunities are the areas where the industry can excel given its characteristics (Robison *et al.*, 2018). One potential opportunity for the tart cherry industry is consumer interest in nutritional/healthy and natural products. The healthy 'functional' aspects of tart cherries most emphasized by the peer-reviewed research revolve around antioxidant and anti-inflammatory benefits (Wang *et al.*, 1999), muscle recovery (Bell *et al.*, 2014), and melatonin for sleep aide (Pigeon *et al.*, 2010). This is consistent with a growing trend toward consumer preferences for healthy foods (Malone and Lusk, 2017; Urala and Lähteenmäki, 2007; Verbeke *et al.*, 2009). As such, processors and entrepreneurs have turned their focus towards the health benefits of tart cherry products, although this strategy has been partially

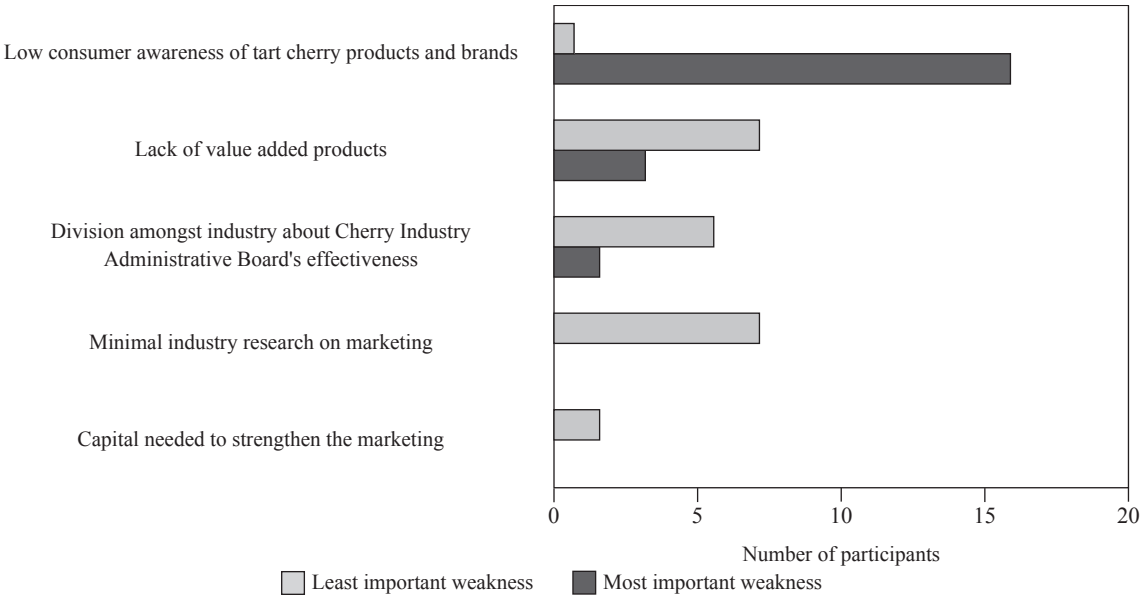

Figure 5. Stakeholder-perceived weaknesses.

challenged by the FDA, who suggested that tart cherry manufacturers had made 'unproven claims' on their websites and labels (McNamara, 2005).

In addition to healthy foods marketing, the local foods market has become a popular mechanism for agribusinesses to earn a premium. This is especially the case for tart cherries in Michigan, as Michiganders considered cherries to be the food most associated with their home state (Malone and Moreno, 2018). With the appropriate labelling, Michigan tart cherry products could potentially earn a significant price premium across the United States.

Another potential opportunity for the tart cherry industry is the fact that many consumers prefer to select from larger, more novel choice sets (Malone and Lusk, 2019). The industry could materialize this opportunity by developing new products. Value-added products, such as alcoholic beverages, dried cherries, and cherry juice, could provide growth areas for tart cherries.

Furthermore, during the last decades, scientific discoveries and technological developments have allowed the rapid development of new cultivars in agriculture. (Wieczorek and Wright, 2012). The tart cherry industry could potentially invest in the development of a new tart cherry tree variety or cultivar which is more resistant to production factors or offers more desirable characteristics for processors, producers and/or consumers. Iezzoni (1996) and Cai *et al.* (2018) note that low-temperature damage to flower buds is the most important limiting factor for tart cherry yields. Yue *et al.* (2017) surveyed tart cherry growers' willingness to invest in improved fruit quality attributes. Tart cherry producers were willing to pay the most for firmness and external color. Furthermore, Gallardo *et al.* (2015) found that market intermediaries were willing to pay most for external red color, good pit removal, and uniform sizes. Previously, a new cultivar of tart cherries, Balaton®, was introduced by Amy Iezzoni in the early 1980's (Good Fruit Grower, 2006). Despite the cultivar's advantages, such as its ability to be sold as a fresh market tart cherry, adoption rates have remained low for agronomic reasons.

Another potential opportunity to capture more value in the marketing chain is the applicability of forward vertical integration in the tart cherry industry. For example, a tart cherry producer could forward vertically integrate into processing through buying a pitting machine and equipment necessary to process 5+1 packs. According to Martinez and Thornsbury (2006), less than one-quarter of processors are grower-processors, meaning the firm grows and processes their own tart cherries.

It is worth mentioning that several of the aforementioned opportunities, could be perceived as a potential internal response to a pre-existing external opportunity. To illustrate, the development of a new cultivar is an internal response to the external opportunity of the rapid technological advancements in the field of biotechnology.

Figure 6 displays which opportunities survey participants identified as most and least important. Participants overwhelmingly selected consumer interest in nutritional/healthy and natural food products as the biggest opportunity, followed by new product development (as an answer to the external opportunity of consumer preference for more novel choice sets). Most participants perceived the creation of new tart cherry varieties as the smallest opportunity. Forward vertical integration and growing consumer interest in local foods were also viewed as secondary opportunities by some participants.

Given the industry's interest in new product development, we also asked stakeholders to identify which product category they believed had the highest growth potential (Figure 7). Over one-third of participants selected health supplements as the product category with the highest growth potential. This is consistent with the identified biggest opportunity for the sector – growing consumer interest in nutritional/healthy and natural food products. This is also consistent with Martinez and Thornsbury (2006) who found that tart cherry processors believed new product forms which emphasized health and nutrition would gain future market share. Additionally, 33% of growers considered alcoholic beverages to represent a novel growth category for tart cherry products. Tart cherry liqueur is an important component of many popular cocktails (Jones and McCarthy, 2017) and tart cherries are a key ingredient for many sour beers. For example, tart cherries are an essential component for the kriek-style Belgian beer which is popular for its tart, fruity finish (Yaeger, 2015). Because of this growing popularity, there may be value in developing closer relationships with groups such as the Michigan Brewers Guild (Gajanan, 2017). Notably, 22 and 11% of participants selected juice and dried products, respectively, to have the highest growth potential. No participant selected juice concentrates as a potential growth area for tart cherry products.

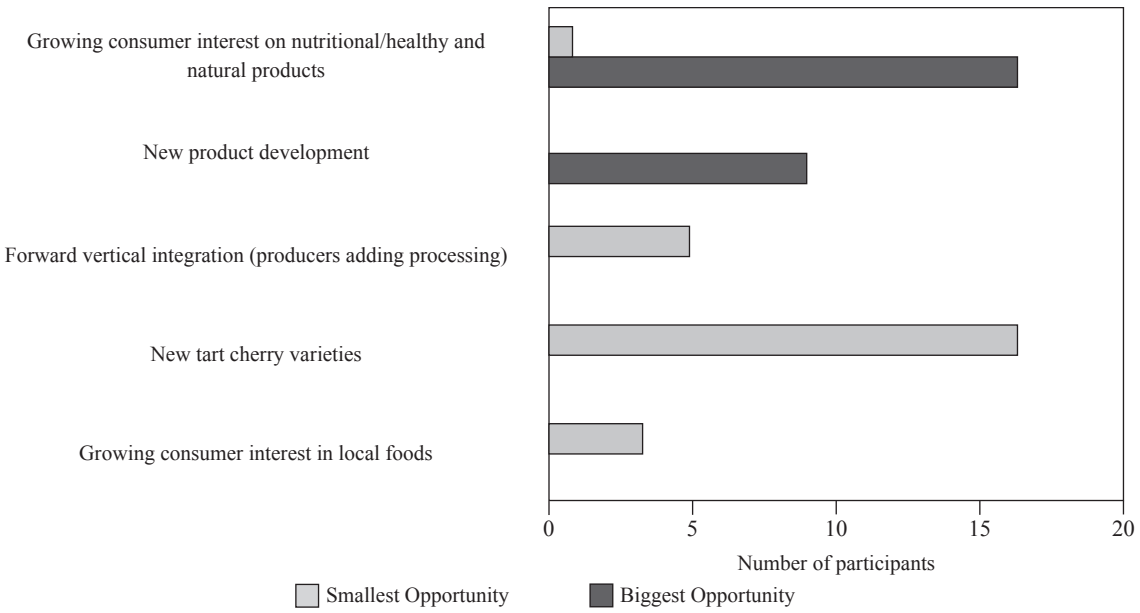

Figure 6. Stakeholder-perceived opportunities.

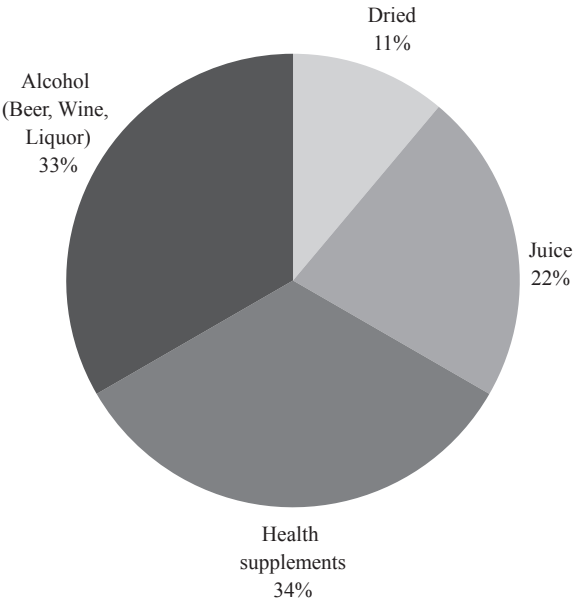

Figure 7. Stakeholder perceptions of products categories with the highest growth potential.

3.5 Threats

Threats represent external concerns that might create long-term issues for the industry's strategic plan, typically represented as strategic issues that the industry must resolve to achieve a successful future (Robison *et al.*, 2018). In agribusiness, external threats are often agronomic, and the tart cherry industry is no exception. Recently, a new production related threat has surfaced – the spotted wing drosophilia (SWD). SWD has been labeled as an 'industry killer' and the 'worst insect' of the past forty years (Lindsey, 2018). Industry surveys suggest the pest decimated 21% of Michigan's 2016 cherry crop (Fruit Growers News, 2019). Mechanisms to control and treat SWD are limited.

Climate change represents a longer-term threat, as agricultural practices are adapting to changes to maintain production (Adams *et al.*, 1990). Tart cherry producers will likely be susceptible to these changes due to the increased variability in tart cherry production due to recent weather events like low-temperature damage from frost. For example, 90% of Michigan tart cherries were lost in 2012-2013 due to an unusually warm spring followed by freezing weather. Many industry members reported 2012-2013 as the 'worst year in recorded history for Michigan fruit' (De Melker, 2012). To illustrate production volatility, forecasts expect Michigan to produce 39.5% more tart cherries by volume in the 2018-2019 production year relative to 2017-2018 (USDA, 2018a). By contrast, growers in Washington and Wisconsin expect to see a slight decrease in production volume. Another significant threat is the increased competition brought on by imported tart cherries and tart cherry products. Since 2005, an increasingly large proportion of U.S. consumption has been fulfilled by foreign competition. According to USDA (2018a) data, during 2012, when the price spikes for domestic processed tart cherries, consumers purchased more than $51 million of imported tart cherries. This spike in price/imports coincides with Michigan's crop damage due to the late frost. At the same time, there are significant tart cherry imports into the United States. Both in dried and juice concentrate, the United States imports the largest volume of tart cherries from Turkey. Subsidized tart cherry juice concentrate from Turkey is driving down growers' prices and it is unclear what premium consumers place on domestically grown tart cherries over internationally grown tart cherries (Noble, 2018a).

The CMI reported that Turkish tart cherry juice concentrate accounted for almost 55% of all U.S. consumption in 2016, while only 12% came from domestic production and 23% was sourced from other international suppliers. This is perhaps unsurprising as an average gallon of Turkish tart cherry juice concentrate sells for $4.59 per gallon compared to $28.00 per gallon for domestic concentrate (Noble, 2018a). At its highest

point in the past few years, $3,562,000 worth of dried cherries were imported from Turkey in 2015. The current influx of imports troubles domestic tart cherry growers and processors as tart cherry growers have experienced a 50% decrease in their prices over the last few years (Noble, 2018a). The U.S. tart cherry industry argues that these price differences suggest that Turkey is 'dumping' tart cherries into the U.S. market. The debate has triggered federal action; in a somewhat symbolic decision, the Trump Administration instituted a half-cent tariff per liter on imported tart cherry juice. In another possible anti-dumping move, industry groups have discussed setting quality standards that might apply to potentially lower-quality foreign exports (Noble, 2018b). Additionally, U.S. tart cherry producers have filed a petition with the U.S. Department of Commerce and International Trade Commission (Galloway, 2019).

When consumers purchase tart cherries, they are implicitly choosing tart cherries over other similar products. As such, another threat to the tart cherry industry is substitute products. While certain attributes are unique to tart cherries, every agricultural product has substitutes. For example, tart cherry juice consumers might have just as easily chosen grape juice, cranberry juice, or apple juice. Dried tart cherry consumers might instead choose to consume dried cranberries or raisins. Thus, it is important to be aware of new product development in competing fruits and changes in consumer preferences as these inadvertently impact the demand for tart cherries. Future work might consider how consumers evaluate tart cherry product attributes relative to other similar food products.

In 2016, the FDA announced that all food packages must comply with a new nutrition facts panel by the beginning of 2020 for companies with $10 million or more in sales and by 2021 for all other companies (U.S. Food and Drug Administration, 2019). Among updating other items such as serving sizes and increasing the font size of the calorie count, the new label must also include the amount of added sugars in the product. These labelling changes are likely to influence consumer choice for food products (Ellison *et al.*, 2016; Messer *et al.*, 2017), including tart cherry products. The new FDA-mandated labeling of added sugars is a threat to the tart cherry industry as it has the potential to challenge the industry's promotion of health claims. For example, demand for tart cherry products like the sugar-laden 5+1 packaging might decrease after the implementation of the new labelling law. Future work might consider quantifying the impact of these regulatory changes on tart cherry demand and ultimately producer and processor profitability.

Tart cherry stakeholder views on the smallest and largest threats to the tart cherry industry are shown in Figure 8. Participants overwhelmingly agreed the most significant threat for the tart cherry industry are imports especially from Turkey. A few participants acknowledged plant diseases and pests as a major threat as well. Most industry members did not consider the new sugar-added label as a significant industry threat. Views were mixed regarding the threat of climate change and substitute fruit products.

4. Conclusions

This article documents the structure of the tart cherry industry by mapping the different members of the industry supply chain and conducts a SWOT analysis. The documentation of the supply chain is essential for the tart cherry industry, since it contributes to the understanding of the industry and can lead to improvement of the strategies used. The SWOT analysis represents a novel contribution as it incorporates the results of a stakeholder survey eliciting the most and least important strengths, weakness, opportunities and threats faced by the industry. Overall, the results indicate that industry stakeholders viewed multiple intermediate products as the most important strength, while low consumer awareness of tart cherry products and brands was identified as the most important weakness. Furthermore, growing consumer interest in nutritional and natural products was viewed as the biggest opportunity by stakeholders. Consistent with this finding, stakeholders considered dietary supplements and alcohol products as the two products with the highest growth potential. Finally, tart cherry industry stakeholders perceived the biggest threat to be the high volume of imports, especially from Turkey.

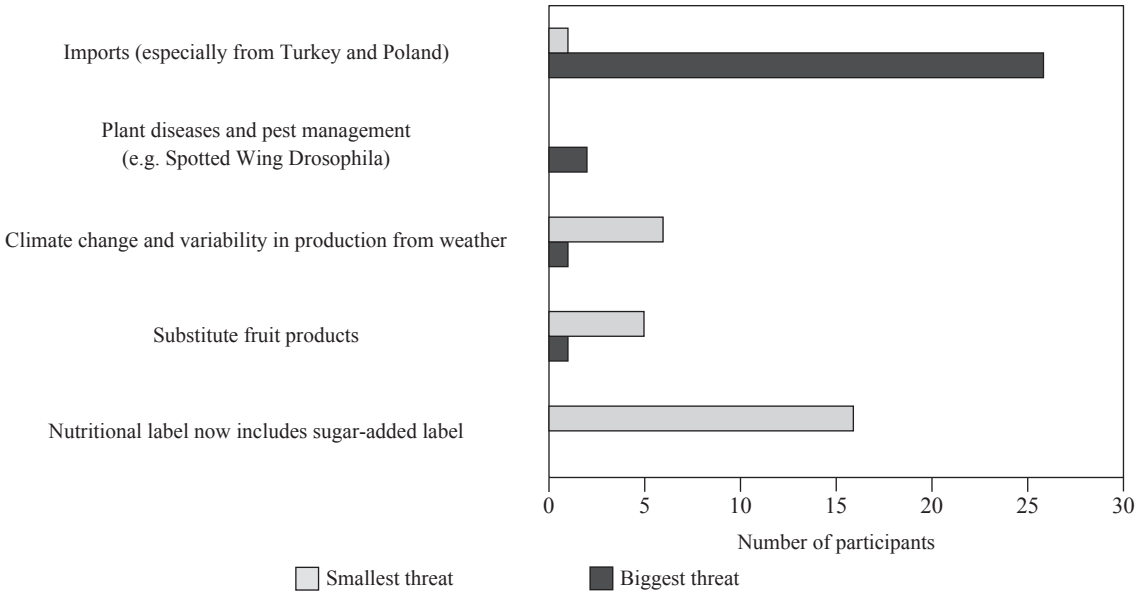

Figure 8. Stakeholder-perceived threats.

Some limitations remain. First, the stakeholder sample size was small, and the survey was brief as it was collected during an industry event. A second and perhaps more important critique is that the stakeholders' survey was based on the initial SWOT analysis implemented. Hence, any underlying flaw of the SWOT analysis makes the subsequent findings from those stakeholder responses biased and of limited validity. Thirdly, the SWOT analyses do not directly link with any form of implementation but rather are best used to frame the discussion around industry strategic decision-making (Hill and Westbrook, 1997). Despite these limitations, by describing the U.S. tart cherry supply chain and performing an industry member-driven SWOT analysis, we provided an analytical overview of the industry and identified key industry issues and further research questions.

This article highlights the need for future research in the tart cherry value chain. First, future research might develop an understanding of how U.S. consumers compare domestic tart cherry products to imported tart cherry alternatives. Furthermore, the likely effects of an added sugar label on tart cherry products, which are commonly marketed for a product's healthfulness, might be investigated.

Acknowledgements

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