

Marketing Power Berries: An Importance-Performance Analysis of Blueberry

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Marketing Power Berries: An Importance-Performance Analysis of Blueberry

Abstract

The unique health benefits of blueberries have increased consumers' demand for this fruit. Although the demand is still low compared to other fruits including apples and grapes, consumers' growing interest in blueberries has led to a significant increase of blueberry acreage in the U.S., causing the supply to exceed demand. To increase blueberry consumption and sales for the benefits of both consumers' health and the blueberry industry, this study selected 18 blueberry attributes and used an online survey to examine blueberry purchasers' perceived importance and satisfaction of these attributes. An importance-performance analysis (IPA) of these attributes was conducted to provide recommendations for future blueberry marketing and research.

All examined attributes were at least slightly important to the blueberry purchasers. Among the 18 attributes, price, pesticide free, and all natural should be what producers and marketers concentrate on to create a more desirable blueberry profile. Recommendations include highlighting local blueberries when they are in season and lower priced, being transparent about pesticide use in blueberry production, and educating consumers about pesticide safety. Working with the regulatory agencies to determine if the all-natural definition used to label some meat products is appropriate for fruits and vegetables was also recommended.

Keywords

Blueberry, marketing, satisfaction, importance, attributes, consumers

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Marketing Power Berries: An Importance-Performance Analysis of Blueberry Attributes

Introduction

Blueberries provide unique health benefits to consumers (U.S. Highbush Blueberry Council, 2014b). Researcher studies have demonstrated that blueberries can improve mobility, protect the heart, improve memory, maintain eye health, and may also act as anti-cancer agents (Bornsek et al., 2012; Liu et al., 2012; Schragger, Hilton, Gould, & Kelly, 2015; Whyte, Schafer, & Williams, 2016; Whyte & Williams, 2012). Consumers' demand for blueberries has been on the rise (U.S. Highbush Blueberry Council, 2014a). This demand has led to a 33% increase of blueberry acreage in the U.S., causing the supply to exceed far beyond the demand (U.S. Highbush Blueberry Council, 2015). Regardless of the increasing per-capita blueberry consumption, the consumption of blueberries in the U.S. remains low when compared to other berries and fruits, including strawberries, grapes, and apples (USDA economic research service, 2015).

To increase blueberry consumption and sales for the benefits of both consumers' health and the blueberry industry, it is important to ensure consumers are satisfied with the product (Oliver, 2010). Satisfaction with a purchase reinforces a consumer's perceptions about the product and reaffirms their purchase decision-making process (Oliver, 2010). Consumer satisfaction results in repeated purchases as well as word-of-mouth promotions, which ultimately benefits producers and the industry (Oliver, 2010).

Consumers' fruit purchasing behavior is heavily influenced by marketing decisions made by producers, marketers, wholesalers, and retailers (Poole, Martínez, & Giménez, 2007). To successfully attract consumers, producers and/or marketers must develop promotional messages emphasizing the characteristics of produce that are desirable to the target consumers (Wolf, 1997). Recognizing product attributes that are important to the consumers plays a significant role in product marketing. For example, Galati, Romeo, Crescimanno, and Schifani (2015) found the attributes of cactus pear fruit largely explained consumers' decisions to consume the fruit. However, consumers' perception of the attributes of blueberries remains unknown.

The role of agricultural communicators has been increasingly broadened from communicating agricultural production, processing, and marketing to communicating about food consumption, nutrition, and health (Zumalt, 2008). The purpose of this study was to provide agricultural communicators and marketers with implications and recommendations for future blueberry marketing strategies that could lead to increased blueberry consumption and a stronger blueberry industry in the U.S.

Conceptual Model and Literature Review

Many research findings have demonstrated tailored messages enhance the relevance of the messages, stimulates greater cognitive activity, and changes individuals' perceptions and behaviors more effectively than non-tailored messages (e.g., Noar, Benac, & Harris, 2007). Content matching, a tailored communication strategy, uses the recipients' preferences and needs to guide the development of the communication content, and has often been considered as the "essence of tailoring" (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008, p. 8). This study applied the concept of content matching to tailor the communication strategies to blueberry consumers' preferences and needs.

Specifically, this study used importance-performance analysis (IPA) as the conceptual model. IPA is an easy-to-use tool for identifying the strengths and weakness of a product for marketing purposes. IPA assesses consumers' evaluation of the attributes of a product from the aspects of perceived importance and satisfaction (Martilla & James, 1977). Using this technique, researchers distribute product attributes on a four-quadrant graph, illustrating the importance of the attributes as well as their performance (Levenburg & Magal, 2004; Siniscalchi, Beale, & Fortuna, 2008) (Figure 1). This graph can be used to guide the development of communication messages. Attributes falling in the top left quadrant should be especially concentrated on by the communicator. These attributes are important to the consumer, but the consumer is not yet satisfied with the attributes (Figure 1). The top right quadrant displays the attributes that are important to the consumers. The consumers are also satisfied with these attributes (Figure 1). Communicators should keep doing what they are doing to maintain consumer satisfaction of the attributes in the top right quadrant. Consumers attach only slight importance to the attributes in the two bottom quadrants. Attributes in the bottom left quadrant are not very important to the consumers and the consumers are relatively not satisfied with these attributes (Figure 1). Communicators should consider these attributes as low priority. Attributes in the bottom right quadrant are considered possible overkill because consumers are satisfied with these attributes, but perceive them to not be very important (Figure 1). Researchers (e.g. Martilla & James, 1977; Shieh & Wu, 2009; Wong, Hideki, & George, 2011) treated the attributes in the possible overkill quadrant as exaggerated and suggested reallocating resources elsewhere, especially to the attributes in the concentrate here quadrant. However, Martilla and James (1977) also stated that attributes falling in the possible overkill quadrant should not always be treated as unnecessary effort. Good reasons may exist to continue with satisfying performances.

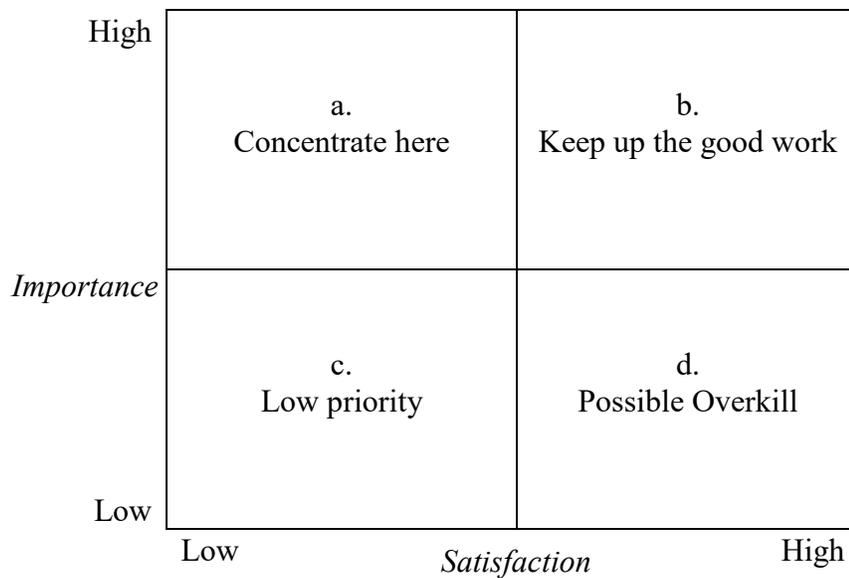


Figure 1: The Original Importance-Performance Analysis Framework (Martilla & James, 1977)

The comparison between the mean of consumers' perceptions of importance and satisfaction presented on a two-dimensional grid facilitates data interpretation and the development of marketing strategies. This technique has been used to evaluate food products and services, and

has provided insights into marketing strategies for the food and agricultural industry (Back, 2012; Park, Oh, Jang, Yoon, & Cho, 2016).

Selecting the appropriate attributes is essential for the usefulness of IPA analysis (Martilla & James, 1977). The attributes selected for this study were based on the selection, experience, and credence attributes of food (Darby & Karni, 1973; Grunert, 2002; Mugera, Burton, & Downsborough, 2017; Nelson, 1970). The selection attributes are the qualities that can be identified during the search process before purchase, while the experience attributes are those that can only be revealed to the consumers as the product is used without additional cost (Nelson, 1970). Search and experience attributes of food products in the literature included color, odor, size, freshness, price, and taste (e.g., Anderson & Anderson, 1991; He, Gao, Sims, & Zhao, 2015; Manalo, 1990). In 1973, Darby and Karni proposed a third “class of properties,” identified as credence qualities (p. 68). Credence qualities describe the attributes that cannot be directly assessed before or during use of the product.

Because consumers generally lack technical expertise, they are usually not able to ascertain the authenticity of credence attributes in a product without extra information costs (Anderson & Anderson, 1991; Darby & Karni, 1973). Examples of credence attributes for food products could be local or organic production. Without access to a grower's location and expertise to evaluate the production method, consumers are not able to determine the authenticity of the products' local or organic production. Other credence attributes of food products found in the literature were genetically modified organism (GMO), animal welfare, calories content, pesticide free, and all natural (Dentoni, Tonsor, Calantone, & Peterson, 2009; He et al., 2015; Hill, Sanchez, Klein, & Boueri, 2015; Hong & Wyer, 1989; Van der Lans, Van Ittersum, De Cicco, & Loseby, 2001).

Researchers have repeatedly reported that taste and freshness are the top influence on consumers' choices related to fresh food products (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Kearney, Kearney, Dunne, & Gibney, 2000; Ragaert, Verbeke, Devlieghere, & Debevere, 2004; Weatherell, Tregear, & Allinson, 2003). Weatherell et al. (2003) reported good taste and freshness were priorities for consumer food choices, followed by other attributes including healthiness, price, local, and organic production.

In an industry report (Intel, 2012), all natural was the second most frequently used food label on new food products in food and beverage industry in 2011. In a different industry report, researchers reported 25% of consumers indicated “100 percent natural” or “all natural” as “the best description to read on a food label” (The Shelton Group, 2011, para. 3). U.S. Department of Agriculture (USDA) defined the term *natural* for meat and poultry labeling in 2005 as “a product containing no artificial ingredient or added color and is only minimally processed. Minimal processing means the product was processed in a manner that does not fundamentally alter the product” (USDA Food Safety and Inspection Service, 2015, para. 20). This definition was not intended to apply to products other than meat and poultry products. However, terms including natural, all natural and 100 percent natural have been used with great liberty on products of all categories and have led to lawsuits because some consumers did not believe the natural claim meets their expectation (Negowetti, 2013). Participants in a focus group had positive associations with the term “all natural,” but were also skeptical and confused by the all-natural claims (Abrams, Meyers, & Irani, 2010).

Consumers have a growing preference for local food. The National Grocery Association (2014) found grocery shoppers rated “more locally grown foods” as the second most desired improvement for grocery stores following the label of “price/cost savings” (p. 26). In two studies, consumers were found to be willing to pay a price premium for locally-produced food (Carpio &

Isengildina-Mass, 2008; Ruth & Rumble, 2015). Local food has been reported to be perceived as having higher quality based on search and experience attributes such as freshness and taste (Byker, Rose, & Serrano, 2010; Chambers, Lobb, Butler, Harvey & Traill, 2007; Dentoni et al., 2009; Goodwin, 2013; Zepeda & Leviten-Reid, 2004). Researchers have reported that consumers believed local food has credence qualities of supporting local producers, supporting the local economy, as well as being environmentally friendly (Darby, Batte, Ernst, & Roe, 2008; Nimon & Beghin 1999; Loureiro, McCluskey, & Mittelhammer, 2002; Thilmany, Bond, & Bond, 2008).

Researchers have also found consumers associate value with organically produced food (e.g., Loureiro & Hine, 2002; Canavari, Nocella, & Scarpa, 2005; Bernard, Zhang, & Gifford, 2006). Some consumers were reported to believe organic food has greater nutritional benefits, is safer, and more environmentally friendly than conventionally produced food (Andersen, 2011; Byrne, Bacon, & Toensmeyer, 1994; Hu, Woods, & Bastin, 2009; Schifferstein & Oude Ophuis, 1998). However, researchers have also found consumers did not believe organically-produced food was healthier than conventionally-produced food (Andersen, 2009).

Whether or not food is made from GMO is another food attribute reported to influence consumers' food purchasing decision. Researchers have reported consumers perceived GMOs to not be as safe or nutritious as organic options (Chassy, 2007; Lemaux, 2009). In recent studies, researchers found more than one-half of American consumers believed GMOs were unsafe to eat (Funk, Raine, Smith, Olmsted, Duggan, & Page, 2015; Langer, 2013). Consumers have also reportedly expressed concerns that food with GMO ingredients could have increased risk of antibiotic-resistant bacteria, increased use of pesticides, adverse environmental effects, and possibly producing unknown toxins (Teisl, Garner, Roe, & Vayda, 2003). Consumers were reportedly willing to pay a premium for food free of GMO ingredients (Baker & Burnham, 2001; Bruno & Campbell, 2016; Lusk, Roosen, & Fox, 2003; Rousu, Huffman, Shogren, & Tegene, 2004). At the time this study was conducted, blueberries had not been on the list of commercialized GMOs on USDA documents (Greene, Wechsler, Adalja, & Hanson, 2016). Based on eXtension.org (2011), "[d]espite the potential advantages that genetic engineering could bring to blueberries, it is unlikely that they will be commercially available in the near future" (para. 4).

Some consumers prefer fair trade products due to concerns about the working conditions of some factories and farms, especially in developing countries. The goal of fair trade is to eliminate or alleviate the poverty of producers, and poor or unethical working conditions including child labor (Andorfer & Liebe, 2012). Researchers reported consumers were willing to pay more for fair trade products including coffee, chocolate, and bananas (Pelsmacker, Driesen, & Rayp, 2005; Rousu & Corrigan, 2008). Consumers were also reportedly willing to pay more if products were produced without child labor or child abuse (Auger, Burke, Devinney, & Louviere, 2003; Rode et al. 2008). However, consumers were found skeptical about whether or not farmers could be benefited by fair trade programs. Consumers might be willing to pay more for fair trade labeled products when they could see the income increase for farmers (Basu & Hicks, 2008). Consumers' attitude toward fair trade products and their willingness to buy fair trade products were also constrained for reasons including difficulties identifying fair trade products, higher price (Shaw, Hogg, Wilson, Shiu, & Hassan, 2006; Uusitalo & Oksanen, 2004), and travel distance to find fair trade products (Becchetti & Rosati, 2007).

Pesticide-free is another trait of fresh produce often perceived positively by some consumers (Onozaka, Bunch, & Larson, 2006; Ott, 1990). Onozaka et al. (2006) reported consumers in California were willing to pay a price premium of 10% to 19% for a variety of fresh, pesticide-

free, produce. Similarly, 66% of the supermarket shoppers in four Atlanta-area counties indicated willingness to pay for 10% to 15% extra for pesticide-free fresh produce (Ott, 1990). Scientists have indicated the necessity to use pesticides to suppress diseases or arthropods on blueberries (Meyer & Cline, 1997; Williamson, Harmon, Liburd, & Dittmar, 2016). Certainly, appropriate methods and type of pesticides should be used in each situation to ensure the health of the blueberry bushes and the safety of the blueberry growers and consumers (Meyer & Cline, 1997; Williamson et al., 2016).

Wirth, Stanton, and Wiley (2011) compared consumers' perceived importance of the search/experience attributes (quality, size, flavor, texture, and price) with credence attributes (produce origin, and production method) of apple. They reported the two credence attributes were relatively unimportant compared to the search and experience attributes (Wirth et al., 2011). Shi et al., (2011) examined consumers' willingness to pay for different attributes of blueberries. They reported consumers were indifferent about blueberries being organic but were positive about blueberries' freshness and growing location (Shi et al., 2011). The U.S. Highbush Blueberry Council (2013) has found consumers value the health benefits, good taste, and convenience (e.g., easy to use, no peeling) of blueberries.

Purpose and Objectives

The purpose of this study was to identify blueberry purchasers' perceived importance and satisfaction with blueberry attributes to inform future blueberry marketing strategies. The study was guided by the following objectives:

1. Describe blueberry purchasers' perceived importance of blueberry attributes.
2. Describe blueberry purchasers' perceived satisfaction with blueberry attributes.
3. Use IPA analysis to identify blueberry attributes associated with importance and satisfaction

Methods

To fulfill the purpose and objectives of this study, an online survey was used to collect data. The population of the original study was adults living in the 31 U.S. states that received shipments of Florida-grown blueberries in 2015. These states were selected because this study was part of a larger project aiming to improve the marketing of Florida blueberries. The sample of the original study included blueberry purchasers and non-purchasers. For this study, only adults who indicated they had purchased blueberries during 2015 were reported. An external online survey company recruited the respondents using non-probability sampling. Non-probability sampling has become an acceptable alternative to probability sampling due to coverage and non-response challenges encountered with probability sampling (Baker et al. 2013). Non-probability samples, such as the one used in this study, are often gathered online by identifying and recruiting panels of individuals willing to complete surveys (Baker et al. 2013). Non-probability sampling is subject to selection, exclusion, and non-participation biases (Baker et al., 2013). To minimize these biases, post-stratification weighting of the data was conducted to adjust the sample based on the 2010 United States' Census population in seven geographic regions (Baker et al., 2013; Kalton & Flores-Cervantes, 2003), South Atlantic (FL, GA, SC, NC, VA, WV, MD, DE), Mid Atlantic (PA, NY, NJ, CT), New England (NH, VT, ME, MA, RI), East South Central (AL, MS, TN, KY), East North Central (OH, IN, IL, MI, WI), West South

Central (AR, LA), West North Central (MN, IA, MO). The states included in the West South Central and West North Central regions were adapted to include only the states that received Florida-grown blueberries. The survey was originally sent to 3,100 potential participants residing in the 31 states, including those who have purchased blueberries in the past year and those who have not. A total of 2,100 respondents provided complete and usable responses, resulting in a participation rate of 67.7%. Out of the 2100 respondents, 1569 indicated they have purchased blueberries during 2015. These 1569 respondents were selected as the sample for this study. In one of the survey questions, we asked respondents to select ‘Strongly Agree’ to ensure respondents were completing the instrument attentively. Respondents who selected options other than “Strongly Agree” for this question were automatically terminated from the survey.

To ensure the face validity of the survey instrument, a panel of experts reviewed and approved the survey prior to data collection. The panel of experts included a professor, two assistant professors, and an industry expert. The professor specialized in food distribution and food economics, one assistant professor specialized in public opinions and evaluations, the other assistant professor specialized in communication of food and agricultural issues. The industry expert worked for a commodity organization.

This study examined the consumers’ perceived importance and satisfaction with blueberry attributes. To ensure the content validity, a thorough literature review of the food attributes relevant to blueberries were conducted. The following attributes were selected: taste, nutrition, smell, size, color, freshness, convenience, price, perceived support of local farmers, in season, growing location, non-GMO, organic, being a fair trade product, grown in the USA, locally grown, pesticide-free, and all natural.

The perceived importance of these attributes was measured on a five-point Likert-type scale (1 = *unimportant*, 2 = *slightly unimportant*, 3 = *neither important nor unimportant*, 4 = *slightly important*, and 5 = *important*). Similarly, respondents’ satisfaction with these attributes was measured on a five-point Likert-type scale (1 = *unsatisfied*, 2 = *slightly unsatisfied*, 3 = *neither satisfied nor unsatisfied*, 4 = *slightly satisfied*, and 5 = *satisfied*). The mean of each attribute’s perceived importance and satisfaction score was calculated and presented on an IPA grid. To better understand and interpret respondents’ quantitative response, responses were categorized into the real limit standard. The real limits contain the upper and lower limits that separate the boundaries of the intervals (Gravetter & Wallnau, 2013). In this study, the real limits set for the five-point scale to interpret the personal value were: 1.00 – 1.49 = *unimportant/unsatisfied*, 1.50 – 2.49 = *slightly unimportant/slightly unsatisfied*, 2.50 – 3.49 = *neither important nor unimportant/neither satisfied nor unsatisfied*, 3.50 – 4.49 = *slightly important/slightly satisfied*, and 4.50 – 5.00 = *important/satisfied*. Although the mean value was used for each attribute’s perceived importance and satisfaction score, we used the median value of the overall importance and the median value of the overall satisfaction of all blueberry attributes to position the horizontal and vertical axes on the IPA grid instead of mean values as “a true interval scale may not exist” (Martilla & James, 1977, p. 79).

Results

Objective 1: Describe Blueberry Purchasers’ Perceived Importance of Blueberry Attributes

The overall importance index of blueberry attributes ranged from 3.65 to 4.94 (Table 1). Based on the real limits, freshness, taste, color, nutrition, grown in the USA, price, all natural,

and pesticide-free were perceived as important. Smell, in season, locally grown, size, convenience, growing location, my purchase supports local farmer, non-GMO, fair trade product, and organic were considered slightly important. Although the non-GMO, fair trade product and organic attributes were perceived as slightly important, the relatively high standard deviation suggested these attributes had a wide range of responses. This result indicated respondents' perceived importance of these attributes varied more greatly than other attributes.

Table 1

Importance and Satisfaction Means for Blueberry Attributes (N = 1569)

	Importance		Satisfaction		ΔM_{i-j}
	M_i	SD	M_j	SD	
Freshness	4.94	.28	4.73	.57	.21
Taste	4.93	.33	4.77	.53	.16
Color	4.69	.57	4.73	.55	-.04
Nutrition	4.65	.64	4.68	.62	-.03
Grown in the USA	4.59	.74	4.54	.74	.05
Price	4.57	.72	4.18	.96	.39
All natural	4.53	.82	4.40	.86	.13
Pesticide-free	4.51	.84	4.24	.97	.27
Smell	4.48	.77	4.58	.68	-.10
In season	4.45	.82	4.48	.72	-.03
Locally grown	4.37	.85	4.36	.86	.01
Size	4.34	.81	4.56	.66	-.22
Convenience	4.32	.83	4.54	.71	-.22
Growing location	4.18	.92	4.36	.81	-.18
My purchase supports local farmer	4.17	.92	4.19	.88	-.02
Non-GMO	3.83	1.29	3.91	1.05	-.08
Fair trade product	3.69	1.14	3.86	.98	-.17
Organic	3.65	1.28	3.99	1.01	-.34

Note. M_i : mean of respondents' perceived importance; M_j : mean of respondents' perceived satisfaction; M_{i-j} : the difference between the mean of perceived importance and mean of perceived satisfaction; Real limit: 1.00 – 1.49 = *unimportant/unsatisfied*, 1.50 – 2.49 = *slightly unimportant/slightly unsatisfied*, 2.50 – 3.49 = *neither important nor unimportant/neither satisfied nor unsatisfied*, 3.50 – 4.49 = *slightly important/slightly satisfied*, and 4.50 – 5.00 = *important/satisfied*.

Objective 2: Describe Blueberry Purchasers' Perceived Satisfaction with Blueberry Attributes

The overall mean satisfaction index scores ranged from 3.89 to 4.77 (Table 1). Based on the real limits, respondents were satisfied with the blueberry attributes of taste, freshness, color, nutrition, smell, size, convenience, and grown in the USA. Respondents were slightly satisfied with in season, all natural, locally grown, growing location, pesticide-free, my purchase supports local farmer, price, organic, non-GMO, and fair trade product attributes. Similar to the perceived importance, although non-GMO and organic attributes were considered slightly satisfied, the

relatively high standard deviation demonstrated a wider range of responses than other attributes. Which means consumers perceived satisfaction with non-GMO and organic attributes toward blueberries vary more greatly than other attributes.

Objective 3: Use IPA Analysis to Identify Blueberry Attributes Associated with Importance and Satisfaction

The grand medians for importance and satisfaction were 4.47 and 4.44 respectively, which were used to position the horizontal and vertical axes on the IPA grid (Figure 2). Three attributes, price, pesticide free, and all natural fell into the concentrate here (high importance but low satisfaction) quadrant. The attributes of taste, freshness, color, nutrition, grown in the USA, and smell fell in keep up the good work (high importance and high satisfaction) quadrant (Figure 2). Locally grown, growing location, my purchase supports local farmer, non-GMO, fair trade product, and organic fell into the quadrant of low priority (low importance and low satisfaction). The possible overkill quadrant received smell, in season, size, and convenience attributes.

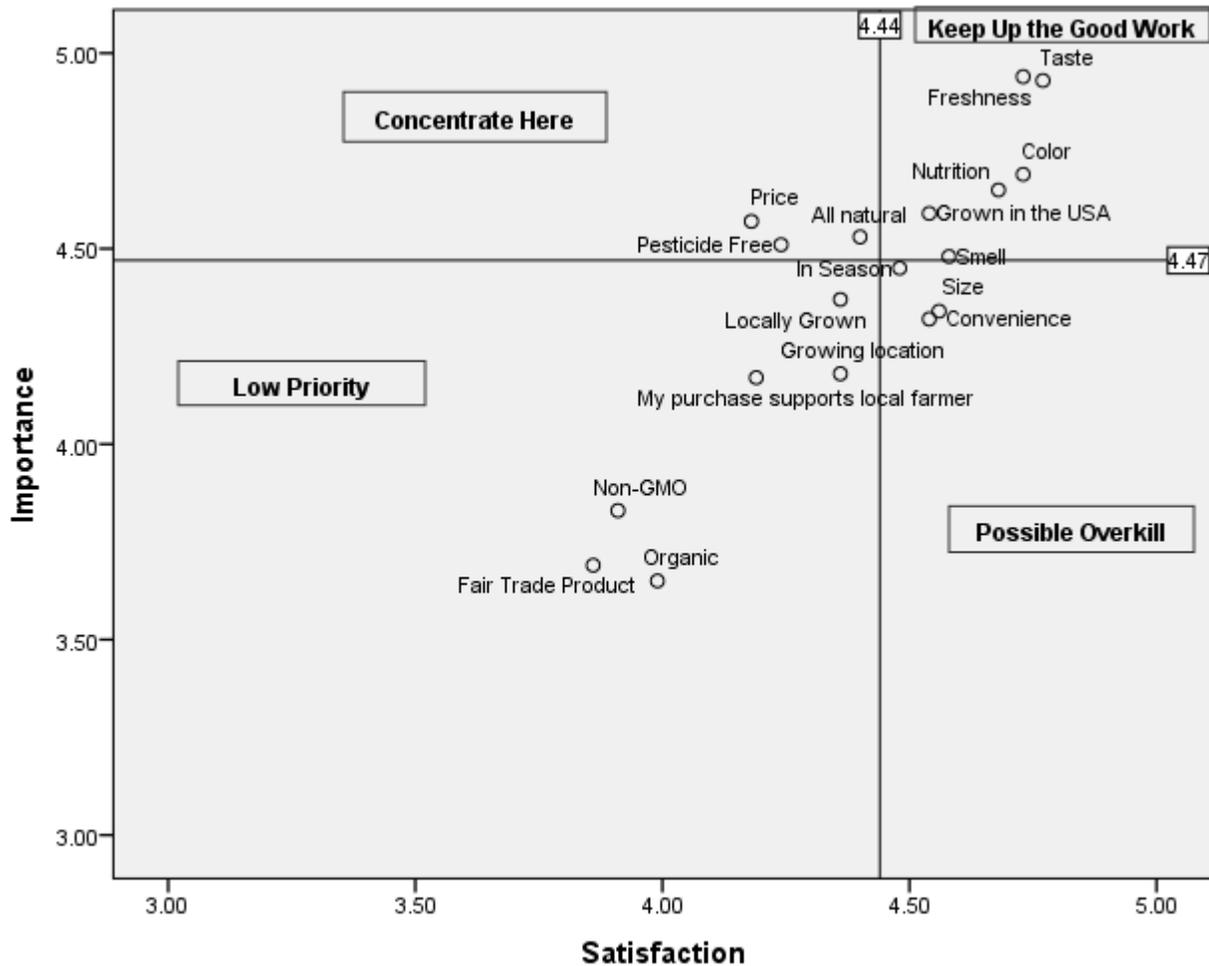


Figure 2: Importance-Performance Analysis of Blueberry Attributes

Conclusions

We identified blueberry purchasers' perceived importance and satisfaction with 18 blueberry attributes and used IPA analysis to inform future blueberry marketing strategies. Respondents perceived all examined blueberry attributes as at least slightly important, and they were at least slightly satisfied with the attributes. Therefore, the examined attributes were valuable to the consumers and validated that the blueberry growers and marketers have done a fairly good job at producing good blueberries and are marketing the attributes valuable to consumers.

Two of the search and experience attributes, freshness and taste, received the highest importance scores. This finding aligns with previous results that taste and freshness are the top influencer on consumers' choices related to fresh food products (Glanz et al., 1998; Kearney et al., 2000; Ragaert et al., 2004; Weatherell et al., 2003). Freshness and taste also received the highest satisfaction score, which indicated blueberries were produced and marketed to meet consumers' most important needs for blueberries. Price, a search attribute, was also perceived as important, but respondents were only slightly satisfied with the price of blueberries. Other search and experience attributes of blueberries (including smell, size, and convenience) satisfied the consumers and were considered slightly important.

For the credence attributes, results showed that consumers perceived the four location-related attributes (i.e., grown in the USA, locally grown, growing location, and my purchase benefits local farmers) differently. Grown in the USA was important to respondents and they were satisfied with this attribute. However, locally grown, growing location, and my purchase benefits local farmers were only perceived as slightly important and respondents were only slightly satisfied. This finding reflected that consumers consider growing origin more important when the growing location is specified instead of only stating locally grown or supporting local growers.

Non-GMO, fair trade product, and organic were the attributes that received the lowest importance score, although they were still perceived as slightly important. Based on previous literature, consumers held skepticisms about these attributes for reasons including not being able to guarantee the results of the stated benefits of these credence attributes (e.g., Basu & Hicks, 2008). Although these blueberry credence attributes (Non-GMO, fair trade product, and organic) were considered slightly important, consumers valued other credence attributes more including nutrition, pesticide free, all natural, in season, and the growing location-related attributes.

Recommendations

To create a more desirable blueberry profile, blueberry producers and marketers should work on the blueberry attributes of price, pesticide free, and all natural as we found these three attributes fell in the concentrate here (the high importance but low satisfaction) quadrant. To improve consumers' satisfaction with blueberry prices communicators should assist marketers, wholesalers, and retailers to develop advertising strategies that emphasize when blueberry prices are low and encourage them to offer deals when possible including buy one get one free and special discounts. In addition, when local produce is in season, the abundance of the produce usually makes it less expensive. Highlighting local blueberries when price is reduced could attract consumers' attention and potentially increase sales.

Using pesticides for blueberries is a common practice to control insects and diseases (Williamson et al., 2016). Communicators and blueberry marketers should be transparent about pesticide use on blueberries. Additionally, they should provide educational materials to the

consumers about the need for pesticide use, pesticide safety, and proper washing procedures before consuming blueberries. These activities and experiences may help to reduce consumers' concerns about pesticide use on blueberries.

Although official definitions of all natural are not offered by the USDA or U.S. Food and Drug Administration (FDA) for fruits and vegetables, consumers have a favorable feeling toward all-natural claims and listed all natural-related labels as the best food descriptions (The Shelton Group, 2011). Taking advantage of consumers' preference for all natural claims could encourage consumers to purchase more blueberries and obtain health benefits from consuming blueberries (Bornsek et al., 2012; Krikorian et al., 2010; Liu et al., 2012; Whyte et al., 2016; Whyte & Williams, 2012). Communicators should work with marketers to identify ways they could use "all natural" or "100% natural" on labels when appropriate to remind shoppers about the nature of blueberries. More importantly, communication professionals should consider working with the regulatory agencies including USDA and FDA to further define "all-natural" for the fruit industry to regulate the use of the term.

This study showed the blueberry attributes of taste, freshness, color, nutrition, grown in the USA, and smell fell in keep up the good work (high importance and high satisfaction) quadrant. Based on the IPA model, marketers should maintain the high consumer satisfaction on these attributes. Therefore, providing fresh blueberries with a ripe blue color, while emphasizing the nutrition values, could continue to meet consumer satisfaction toward blueberries and, therefore, possibly increase blueberries sales. Considering consumers' perceived importance of the Grown in the USA label, marketers should include Grown in the USA on the package label when blueberries are domestically produced. When marketing blueberries to the blueberry's growing state, highlighting the producing state or state logo could increase consumers' purchase as previous studies have shown U.S. consumers would prefer fresh produce from their own state over those produced in other U.S. states (Carpio & Isengildina-Mass, 2008; Ruth & Rumble, 2015; Shi et al., 2013).

Non-GMO, fair trade product, organic, locally grown, and growing location fell into the quadrant of Low Priority. Per the IPA model (Martilla & James, 1977), low priority attributes should receive a low priority in resource allocation (Oh, 2001). However, considering consumers perceived these blueberry attributes as slightly important, communicators should work with blueberry marketers, wholesalers, and retailers to maintain consumers' satisfaction levels with these attributes. Because genetically modified blueberries have not been on the market so far, agricultural educators, communicators, and marketers should inform consumers about this information and provide relevant biotechnology education to consumers.

In this study, we tested consumers' perceived importance and satisfaction with 18 blueberry attributes. Each of the attributes could be extended for an in-depth study. To help researchers and marketers address the three most important attributes that exhibited the lowest level of satisfaction (price, pesticide use, and all natural), researchers should explore ways, such as message testing and educational video testing, to increase consumers' level of satisfaction of these three attributes. To improve consumers' satisfaction with the price of blueberries, researchers should conduct focus group research to discuss consumers' willingness to pay for various types of blueberries such as organic blueberries, blueberries produced in consumers' home state, in the USA, and in other states. It is also necessary to seek opportunities to educate consumers about price fluctuations and price setting of food through education channels such as extension workshops and webinars.

Researchers should examine consumers' perceptions of pesticide use in general. These research findings could help educators and communicators to design educational materials about the science of pesticide use and take opportunities to address consumers' concerns. Researchers should also investigate how consumers prepare blueberries before consuming them in order to identify needs to educate consumers about blueberry handling procedures related to pesticide safety.

Researchers found consumers were skeptical and confused about all natural claims although they attach positive associations to the attribute (Abrams et al., 2010). Researchers should explore consumers' understanding of all natural claims on blueberries. This could also be taken to the next level by exploring consumers' perceptions of using all natural labels on fresh produce since fresh produce share the quality of being natural in a broad sense. Such findings may push forward the development of the definition of natural for vegetables and fruits. With a clear definition, USDA and FDA could regulate the use of all natural labels on fruits and vegetables. With that, educators and communicators could provide better information to consumers to possibly reduce consumers' confusion around the all-natural claims on produce.

Finally, this study focused on blueberry purchasers who have purchased blueberries the past year as the target population. Researchers should identify sub-groups of consumers to identify their unique preferences and needs for blueberries. Blueberries have been found to improve heart, brain and eye health. Therefore, examining the consumers who might be in need of these health benefits would assist marketers to match the content of the blueberry marketing materials to these targeted consumers' unique blueberry nutritional needs.

Results of this study showed the attributes including non-GMO, organic, and fair trade product had a wider range of perceived importance and satisfaction than other attributes. Researchers should differentiate consumers with different levels of perceived importance and satisfaction of these attributes. Such research could provide recommendations to tailor marketing strategies about these attributes to the consumers with different perceptions of these attributes.

Researchers should further develop tailored messages about the blueberry attributes and investigate how the tailored messages influence the intended consumers. Such research studies should investigate if the tailored messages catch more of consumers' attention about blueberries. Researchers should follow up and assess how tailored messages influence consumers' personal involvement and if tailored messages elicit more effortful processing of the message. Further, it is valuable to examine if the tailored messages enhance the source credibility, which leads the targeted consumers to follow recommendations with less critical analysis. Such studies will provide insights to marketers and communicators for creating a more effective marketing materials of blueberries and potentially other fruits and vegetables.

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