Consumer Perceptions of the Health Benefits of Sweet Corn

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Abstract

Promoting vegetable intake, including starchy vegetables, is a step towards health-enhancing plant-based dietary patterns and the reduction of chronic disease. This study explored consumer perceptions of sweet corn and purchasing behaviors. A nationally representative sample (n=1502) reported positive perceptions of sweet corn; most agreed that sweet corn promotes overall health and well-being and may reduce the risk of chronic disease. However, fewer than 50% of consumers were aware that sweet corn contains zeaxanthin and lutein, carotenoids that support eye and cognitive health. There is an opportunity to promote the health benefits of sweet corn and thereby support vegetable consumption.

Introduction

Plant-based dietary patterns emphasizing vegetables, fruits, whole-grain cereals, legumes, and nuts are recommended for the prevention of chronic disease (USDA & USDHHS, 2020). However, the obesogenic, inflammatory American dietary pattern, laden with animal-sourced and ultra-processed foods, continues to prevail. The intake of vegetables by the American population is particularly poor, with 90% falling below recommendations (USDA & USDHHS, 2020). Surprisingly, this deficit also includes starchy vegetables, such as sweet corn, even though the recommended intake of this vegetable subgroup is only 5 cups a week compared to 2½ cups per day for total vegetables in a 2000 kcal Healthy US-Style Dietary Pattern (USDA & USDHHS, 2020). There is a pressing need for Family and Consumer Sciences (FCS) Extension programming to promote and support increased vegetable intake, including starchy vegetables.

In recent years, FCS nutrition educators may have become cautious about the promotion of starchy vegetables due to the pervasive consumption of fried potatoes (fries) and potato chips, but possibly also the lack of awareness of the nutrient density, bioactive components, and potential to improve diet quality by consuming starchy vegetables (Agarwal & Fulgoni III, 2021). Sweet corn, for example, at only 86 kcal for a medium cob, provides 3 g of protein, 2 g of dietary fiber, and a significant source of potassium at 270 mg (USDA, 2023), a short-fall nutrient critical for the prevention and management of hypertension (Chia et al., 2025). Perhaps more importantly, sweet corn is a source of zeaxanthin and lutein (USDA, 2023), carotenoids critical to eye health and the prevention of age-related macular degeneration (Mrowicka et al., 2022). Additionally, lutein and zeaxanthin are unique xanthophyll carotenoids taken up by the brain. Higher blood levels of these carotenoids are associated with better cognitive function, memory, and executive function (Feeney et al., 2017) and are inversely related to the risk of Alzheimer's disease (Qu et al., 2021). Corn is one of the few concentrated food sources of zeaxanthin (Eisenhauer et al., 2017) and is the main dietary source in the U.S. diet (Perry et al., 2009).

In U.S. dietary recommendations, sweet corn has traditionally been characterized by its carbohydrate content compared to most other vegetables, with little emphasis on its overall nutrient and bioactive contents or its whole-grain botanical classification. A recent assessment of foods using nutrient profiling models recommended that sweet corn and other starchy vegetables be reassigned to a "higher quality" carbohydrate food category for dietary guidance, the same designation given to non-starchy vegetables, legumes, whole fruits, and whole grains (Drewnowski et al., 2022). Additionally, the glycemic index of whole sweet corn, a numerical scale comparing blood glucose response to a carbohydrate-containing food, is lower than many breads and cereals typically consumed in North America (Atkinson et al., 2021). Similar to diets high in fiber and whole grains, diets of lower glycemic index may have positive effects on chronic disease-related health outcomes (Jenkins et al., 2024). The prudent inclusion of starchy vegetables, such as sweet corn, into one's dietary pattern may enhance diet quality by increasing total vegetable intake. Perhaps most importantly, sweet corn consumption may improve the dietary intake of bioactive carotenoids required for eye and brain health.

The typical inflammatory American diet is associated with a plethora of adverse health outcomes, including type 2 diabetes,

cardiovascular disease, and all-cause mortality (Yuan et al., 2022). Commonly consumed ultra-processed foods, specifically, are associated with common mental disorders such as anxiety and depression (Lane et al., 2024; Pagliai et al., 2021) as well as dementia (Henney et al., 2024). A shift to consuming more whole and minimally processed foods, such as sweet corn (da Silva Oliveira & Silva-Amparo, 2018), is needed. However, the per capita intake of sweet corn, traditionally considered a staple vegetable in the US, is on the decline (Shahbandeh, 2024), and little recent research has examined sweet corn purchasing behaviors of consumers (Johnson et al., 2024). To determine possible contributors to this decline and inform educational programming to promote vegetable consumption, this study sought to explore consumer perceptions of sweet corn, with a focus on perceived health benefits and purchasing behaviors.

Objective

Current popular diet trends promote high protein (Ko et al., 2020), and cohort studies of U.S. adults reflect this trend, showing increasing dietary energy from protein and fat and decreasing energy from carbohydrates (Gu et al., 2024; Shan et al., 2019). Given this environment, we hypothesized that many consumers would have negative perceptions of the health effects of sweet corn, particularly related to its carbohydrate content. Furthermore, we hypothesized that most consumers would be unaware of the potential health benefits of the bioactive carotenoid contents of sweet corn. The primary aim of this study was to explore the consumer perceptions of the health benefits of consuming sweet corn. Additionally, various aspects of sweet corn purchasing behaviors, preferences, and past experiences with sweet corn quality were explored to gain insight into other potential factors that may be contributing to declining intake.

Methods

A survey of consumer perceptions of sweet corn was developed. In part one of the survey, 13 items focused on perceived health benefits using the following scale: strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, and strongly disagree, which were balanced answer options to reduce bias (Table 1). Items on health benefits were positive statements based on the current health research, discussed above, and explored consumers' perceptions on whether sweet corn contributes to overall health and well-being, glycemic control, and reduced risk of cardiovascular disease. Additionally, items on lutein and zeaxanthin content and eye health, vitamins and mineral provision, anti-inflammatory properties, dietary fiber and digestive health, and energy and weight management were included. Consumer perceptions of the nutrient contents of frozen and canned versus fresh on the cob were also queried. Part two of the survey focused on sweet corn consumption patterns, quality characteristics of sweet corn on the cob, and sweet corn purchasing preferences and experiences. These items were developed in consultation with a multi-state team of sweet corn research scientists and industry representatives to ensure content validity. Following pilot testing in August 2024, an anonymous nationally represented sample of the U.S. population across gender, race, ethnicity, age, and region was administered by Qualtrics^{XM} Research Services, which controlled for social desirability and sampling biases. Surveys flagged for response pattern bias were excluded. The survey was approved as exempt by the University of Florida's Research Division of Research Operations on June 6, 2024 (Protocol#: ET00041543).

Results

Data was collected from August – September 2024. The demographics of the study population are presented in Table 2. Respondents equally represented the four regions of the United States, Midwest (n = 378; 25%), Northeast (n = 374; 25%), South (n = 375; 25%), and West (n = 375; 25%). For the consumer perceptions of the health benefits of sweet corn, responses to the Likert-like scale, from strongly agree to strongly disagree, are presented in Table 1. Regarding health benefits, most (64%) agreed (sum of strongly agree and somewhat agree) that sweet corn promotes overall health and well-being, and 60% said that consuming sweet corn regularly contributes positively to overall health. A majority (61%) agreed that consuming sweet corn, with its

lower glycemic index than many breads and cereals, may help manage blood glucose levels. A total of 72% of the respondents agreed that sweet corn provides essential vitamins and minerals. Most respondents (57%) agreed that sweet corn contains antioxidants, which may help to reduce the risk of cardiovascular disease. Fifty-one percent agreed that sweet corn contains phytonutrients with potential anti-inflammatory properties, but only 47% agreed that sweet corn contains lutein and zeaxanthin, which support eye health. Many respondents (73%) agreed that sweet corn is a good source of dietary fiber, which helps to support digestive health and regularity. In terms of energy and weight management, 65% of respondents agreed that sweet corn provides energy for physical activity and overall vitality. Additionally, 54% agreed that consuming sweet corn may support healthy weight management, while 11% somewhat or strongly disagreed with this statement. Regarding whether consuming sweet corn may help reduce the risk of cognitive decline, 50% of respondents selected “neither agree nor disagree,” and 12% disagreed (somewhat or strongly disagreed) with this statement. Finally, 55% agreed that frozen sweet corn provides similar nutritional and health benefits as fresh corn, while 44% agreed that canned sweet corn provides similar benefits.

Regarding the findings on sweet corn consumption patterns, quality characteristics, and purchasing preferences and experiences, most respondents (66%) reported they ate sweet corn at least 2-3 times a month, with 7% reporting an intake of 3 or more times per week. Conversely, 18% of respondents who reported “never” or “once or twice a year” for sweet corn consumption were directed to an item querying some reasons people may choose not to eat sweet corn (fresh, frozen, or canned). Table 3 shows the responses of this subsample of 263 respondents who do not typically eat sweet corn. Personal taste preferences, followed by availability of fresh sweet corn and digestive issues, were the most frequently noted reasons for not consuming sweet corn.

Ten questions were specifically focused on fresh corn on the cob. In response to “What influences your decision to buy fresh sweet corn on the cob?” freshness (75%), taste (62%), price (55%), and availability (52%) were noted by most consumers, with appearance (47%) and nutritional value (30%) less often influencing their decision to purchase sweet corn on the cob. Most (68%) agreed that the quality of sweet corn on the cob at their grocery store was consistently high and maintained its quality after purchase (81%). As an indicator of sustainability, 79% prefer corn on the cob in husk rather than packaged in plastic wrap (tray packs), and 91% indicated they eat fresh sweet corn on the cob when it is in season. Most respondents indicated buying fresh sweet corn on the cob from the grocery store, although some commented that they sourced it from their personal garden, family, friends, or directly from a farm. A total of 78% were ‘somewhat’ or ‘definitely’ more likely to buy locally sourced or organic sweet corn. Only 35% indicated that they had ever eaten raw (uncooked) sweet corn, and of those that had not, noted reasons such as: “Never thought about eating raw corn,” “I do not think it would taste good,” “It seems like it would be too hard,” “Not good for you to eat raw,” and “Not appealing.” Finally, the quality of sweet corn on the cob was queried by providing a list of concerns consumers may have experienced. The most frequent quality problems noted were lack of sweetness and flavor, and kernel issues, such as dry and shriveled (see Table 4). A radar chart in Figure 1 depicts the qualities of sweet corn on the cob important to survey respondents on a scale from 0 (not important) to 10 (very important). In brief, eight qualities of sweet corn on the cob were ranked with a mean of 7.4 or higher out of 10.

The prices of fresh, canned, and frozen sweet corn were considered budget-friendly by 81%, 78%, and 76% of respondents, respectively. Of those that typically ate sweet corn, 82% of survey respondents, 78% were either ‘very likely’ or ‘somewhat likely’ to purchase sweet corn during their next grocery trip. Notably, 73% planned to incorporate sweet corn (canned, frozen, or corn on the cob) into their meals in the upcoming week.

Discussion

Survey respondents, representative of the U.S. adult population, reported positive perceptions of the health benefits of sweet corn, including many agreeing with sweet corn’s role in managing blood glucose and supporting healthy weight management, health outcomes that require confirmatory health research. Phrasing of the health items may have contributed to bias by leading

responders toward positive responses. Future studies could be structured with more neutral language and query potential concerns. We hypothesized that consumers might harbor negative perceptions of sweet corn due to its carbohydrate content, given popular diet trends for high-protein and low-carbohydrate foods. In general, this hypothesis was not supported by the findings. For those respondents who typically did not eat sweet corn, just 16% indicated high carbohydrate content, and 17%, high sugar content. Additionally, only 5% selected “high glycemic index” as a reason not to eat corn, which is in line with studies that show sweet corn has no more than a medium glycemic index (Atkinson et al., 2021).

Our second hypothesis focused on whether consumers would be unaware of the health benefits of the bioactive constituents of sweet corn. Over 50% agreed that sweet corn contains phytonutrients with potential anti-inflammatory properties and that sweet corn contains antioxidants, which may help to reduce the risk of cardiovascular disease, findings that did not directly support our hypothesis. However, in alignment with our hypothesis, less than 50% of respondents agreed that sweet corn contains lutein and zeaxanthin, which support eye health. Additionally, most respondents were unsure or disagreed that consuming sweet corn may help reduce the risk of cognitive decline, a risk associated with blood levels of lutein and zeaxanthin (Wang et al., 2023). Although there is convincing evidence for lutein intake and the prevention of degenerative eye disease (Mrowicka et al., 2022), only associations with dietary patterns higher in lutein and zeaxanthin (Holthaus et al., 2024) and brain health are currently supported by research evidence (van Soest et al., 2024). Interventional dietary studies, including sweet corn, are needed to provide direct evidence of brain health benefits. Although corn is the main source of zeaxanthin in the U.S. diet (Perry et al., 2009), important to neurological health (Agarwal et al., 2022; Qu et al., 2021), it is not currently recognized as a key component of the Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) dietary pattern (Marcason, 2015) associated with cognitive health (van Soest et al., 2024). The MIND diet screener, a 15-item tool used to quickly assess adherence to the MIND dietary pattern, lists broccoli, carrots, peas, onions, green/red peppers, celery, string beans, tomatoes, yams, squash, and eggplant as other types of vegetables but not sweet corn (Marcason et al., 2015). The present study provides evidence that most consumers eat sweet corn and have positive perceptions of its health benefits; thus, its inclusion into the MIND dietary pattern should be considered. Consuming sweet corn more often may increase carotenoid intakes and support brain health; however, confirmatory research is needed.

Of the representative sample of the U.S. population, most respondents noted sweet corn to be budget-friendly and confirmed that they buy and eat sweet corn, but perhaps not often enough. The results of this study identify key points for food and nutrition Extension programming. First, consumers have positive perceptions of the health benefits of sweet corn, and therefore, there is an opportunity for FCS educators to promote sweet corn consumption and thereby increase vegetable intake, supporting diet quality and wellness. Although research is needed to confirm sweet corn’s specific contributions to overall health, there is currently no known research showing that the consumption of sweet corn contributes to any cardiometabolic harm (Dahl &Gerstenfeld, 2024). Given its dietary fiber, nutrient, and carotenoid contents and less processed nature, consumption is expected to support health, particularly as a ‘whole grain’ substitute for refined grains. Second, survey responses suggested that many consumers perceive that frozen and canned corn do not provide the nutritional and health benefits of fresh sweet corn. It is possible that this misconception extends to other frozen and canned vegetables. Although many canned vegetables, including sweet corn, have added sodium – a nutrient of concern, low and no-added-sodium brands are readily available. Education is needed to inform consumers of the healthfulness of minimally processed sweet corn and other vegetables, especially budget-friendly, shelf-stable, convenient alternatives for when fresh options are limited.

In conclusion, unprocessed and minimally processed plant foods, such as sweet corn, are recommended to support chronic disease risk reduction (USDA & USHHS, 2020). This, in combination with its nutrient and bioactive contents, supports sweet corn as a healthful food compared to the many ultra-processed foods made from milled field corn. The present study provides evidence that the

average consumer has favorable perceptions of the health benefits of sweet corn, but many are not aware of the specific health benefits of the carotenoids and their unique connections with eye and brain degenerative diseases. Overall, the findings suggest that there may be an opportunity to educate on the health benefits of xanthophyll carotenoids and other bioactive components of sweet corn.

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Tables

Table 1.

Consumer perceptions of the health benefits of sweet corn.

Survey Item	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Consuming sweet corn as part of a balanced diet promotes overall health and well-being.	26%	38%	26%	8%	3%
Consuming sweet corn regularly contributes positively to overall health.	20%	40%	28%	10%	3%
Consuming sweet corn, with its lower glycemic index than many breads and cereals, may help manage blood glucose levels.	20%	41%	32%	5%	2%
Sweet corn provides essential vitamins and minerals.	29%	43%	20%	6%	2%
Sweet corn contains antioxidants, which may help reduce the risk of cardiovascular disease.	22%	35%	35%	6%	3%
Sweet corn contains phytonutrients with potential anti-inflammatory properties.	17%	34%	42%	5%	2%
Sweet corn contains lutein and zeaxanthin, which support eye health.	18%	29%	45%	6%	2%
Sweet corn is a good source of dietary fiber, which helps to promote digestive health and regularity.	33%	40%	20%	5%	2%
Sweet corn provides energy for physical activity and overall vitality.	25%	40%	27%	7%	2%
Consuming sweet corn may support healthy weight management.	20%	34%	35%	9%	2%
Consuming sweet corn may help reduce the risk of cognitive decline.	15%	24%	50%	9%	3%
Frozen sweet corn provides similar nutritional and health benefits as fresh corn on the cob.	21%	34%	26%	15%	4%
Canned sweet corn provides similar nutritional and health benefits as fresh corn on the cob.	14%	30%	29%	21%	6%

Total respondents n=1502

Tables

Table 2.

Demographic characteristics of survey respondents.

Characteristics	Respondents (n = 1502)
Gender, n (%)	
Male	751 (50%)
Female	750 (50%)
Other	1 (<1%)
Age, n (%)	
18–27	305 (20%)
28–43	301 (20%)
44–59	300 (20%)
60–69	339 (23%)
70 – 78	200 (13%)
79 – 96	57 (4%)
Race, n (%)	
American Indian or Alaska Native	35 (2%)
Asian	72 (5%)
Black or African American	231 (15%)
Native Hawaiian or Pacific Islander	7 (<1%)
White	1157 (77%)
Other	48 (3%)
None of the above	12 (<1%)

Characteristics	Respondents (n = 1502)
Ethnicity, n (%)	
Hispanic or Latino	164 (11%)
Not Hispanic or Latino	1338 (89%)
Region of United States	
Midwest	378 (25%)
Northeast	374 (25%)
South	375 (25%)
West	375 (25%)

Tables

Table 3.

Responses to the survey item "The following are some reasons people may choose not to eat sweet corn (fresh, frozen, or canned). Why don't you like or buy sweet corn?"

Reasons	Responses (n = 263)
Personal taste preferences	76 (29%)
Availability of fresh sweet corn	63 (24%)
Digestive issues	61 (23%)
Other	50 (19%)
High sugar content	45 (17%)
Dietary restrictions	42 (16%)
High carbohydrate content	42 (16%)
Cost	33 (13%)
Concerns about GMOs	21 (8%)
Low protein content	19 (7%)
Low nutrient density	15 (6%)
Allergies	15 (6%)
High glycemic index	14 (5%)
Environmental concerns	11 (4%)
Caloric density	10 (4%)

Tables

Table 4.

Responses to the survey item, "The quality of sweet corn on the cob can be affected by many factors, such as storage. Which, if any, quality concerns have you experienced?"

Quality concerns	Responses (n = 1498)
Lack of sweetness	642 (43%)
Dry or shriveled kernels	573 (38%)
Loss of flavor	572 (38%)
Tough or chewy kernels	562 (38%)
Loss of crispness	421 (28%)
Overly starchy or mealy texture	328 (22%)
Worm or insect damage	326 (22%)
Inconsistent kernel size	295 (20%)
Mold or rot	234 (16%)
Other	141 (9%)

Figures

Figure 1.

Sensory qualities of sweet corn on the cob that were important to consumers. The data point's distance from the center represents the value for each variable on a scale from 0 = not important, 10 = very important.