



Thomas P. Koch
Mayor

**City of Quincy Department of Health,
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Health Department

Marli Caslli
Commissioner

**Final Report on the Survey of Nutrition and Dietary Habits of Attendees
Quincy's Kilroy Square Farmers and Artisans Market**



Prepared by

City of Quincy Health Department

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Preparers of the report

This report was prepared by Quincy Health Department staff and consultant:

Sopheaksoksandy So, MPH, MLS(ASCP)^{CM}, Jae Young Cho, MPH, BSPS, Marli Caslli, MPH, MS, Suzanne Condon, MSM

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Executive Summary

Farmer markets have been an outlet for healthy, fresh, locally sourced food products in Massachusetts and elsewhere in the United States and have been popular nationwide due to consumers' increased interest in such food products. While there has been an increase in farmer markets across the country, published research is limited regarding consumer demographics and dietary habits on a local level. Farmer markets are public places where farmers and vendors primarily sell fresh produce, baked goods, and other farm-related products directly to consumers. In the United States, farmer markets have been growing rapidly over the past few decades. According to the United States Department of Agriculture (USDA) (2022), there were over 8,000 farmer markets in 2021, which is a significant increase from the 1,755 markets that existed in 1994. Farmer markets offer an opportunity for farmers to earn a fair income, reduce transportation costs, and increase sales by selling directly to consumers.

In addition to the economic benefits, farmer markets have several potential public health benefits. For example, farmer markets offer consumers access to fresh and locally sourced produce, which is generally higher in nutrient content than processed foods. Moreover, these markets provide an opportunity for public health officials to provide consumers with important information about healthy eating habits and the health benefits of nutritious food. Farmer markets have been found to increase fruit and vegetable consumption among consumers who shop at markets regularly. The markets have also been associated with increased social interaction and community cohesion, which also have the potential to improve health and mental health outcomes (Warsaw, 2021).

The Quincy Health Department conducted a survey to gain an understanding of the demographic patterns, dietary habits, and health concerns of residents of the City of Quincy who

attended Quincy's Kilroy Square Farmers and Artisans Market (KSFAM) during the 2022 season and compared selected results to Quincy demographics and United States Department of Agriculture (USDA) Dietary Guidelines. From June 24, 2022, to October 28, 2022, the Quincy Health Department (QHD) staffed a table at the KSFAM. Patrons who visited the QHD table were asked to complete a survey. Descriptive analysis of the survey data was performed for 132 surveys for Quincy resident respondents.

The findings indicated that the majority of Quincy resident participants were female (82%), between the ages of 40-74 (64%), and identified as White (67%). Most participants reported eating 2-3 servings of fruit (39%) followed by 1 serving of fruit (34%) and 2-3 servings of vegetables (72%) daily. Note: Participants in the 40-70 year age groups were more likely to consume fruits and vegetables more frequently than their counterparts in the 20-39 year age group. Participants reported eating protein (meat/fish/beans) 2-3 times a day (48%) and dairy products once per day (39%) followed by those reporting dairy consumption 2-3 times a day (34%).

These findings suggest the need to promote more frequent consumption of fruits and vegetables even among populations with an interest in consuming healthy and locally sourced food products consistent with USDA Dietary Guidelines 2020-2025 MyPlate recommendations. The survey results provide important insights about nutritional behaviors among residents of the City of Quincy and critical public health implications that suggest a need for promoting consumption of healthy foods and nutrition education for all residents.

Introduction and Background

Farmer markets have been in existence for centuries, and their history can be traced back to the Roman Empire. Farmer markets were designed to provide farmers with a venue to sell their produce directly to consumers, bypassing intermediaries and ensuring that they received a fair price for their goods. In the United States, farmer markets began to gain popularity in the early 20th century, but it wasn't until the 1970s that they experienced a significant resurgence. The growth of farmer markets in the United States can be attributed to several factors, including the growing interest in organic and locally sourced food products and the increased awareness of the negative impact of processed foods on public health (USDA, 2022).

According to the USDA, the number of farmer markets in the United States has grown steadily over the past few decades. The number of farmer markets in the United States has significantly increased from 1,755 markets in 1994 to over 8,000 markets in 2021 (USDA, 2022). Farmer markets in Massachusetts and elsewhere offer several advantages to consumers, including access to fresh and locally sourced produce, the opportunity to learn about healthy eating habits, and the chance to interact with farmers and vendors directly. In addition, farmer markets offer reasonable pricing for customers and often accept MA Supplemental Nutrition Assistance Program/ Electronic Benefit Transfer (SNAP/EBT) benefits for purchasing produce.

Daniel R. George highlighted the positive impact of farmer markets on public health, in a manuscript published in 2011. His research indicated that farmer market patrons consume more fruits and vegetables than people who do not attend farmer markets, making them more likely to meet their recommended daily intake. In addition, farmer markets have been shown to improve food security for low-income households. George's research also showed that farmer market

consumers experience increased social interaction and community cohesion, leading to improved mental health outcomes.

The Quincy Farmers Market has been in operation for over 40 years and was first established in 1981 by Anneli Johnson, a neighborhood activist from West Quincy and a great supporter of agriculture. The purpose of establishing the Quincy Farmers Market was to support local farmers and small businesses as well as to provide fresh, healthy, locally sourced food to the residents of Quincy. Ms. Johnson operated the Quincy Farmers Market for about 30 years. In the fall of 2010, she turned over management of the Quincy Farmers Market to Janet Little, another neighborhood activist from Houghs Neck, Quincy. In 2022, the Quincy Chamber of Commerce (aka the Chamber) assumed management of the market, and it was officially renamed Quincy's Kilroy Square Farmers & Artisans Market (KSFAM) (personal communication Mr. Timothy Cahill, Executive Director of the Chamber, April 4, 2023).

The KSFAM is located in Kilroy Square in the heart of Quincy Center. Kilroy Square is centrally located and surrounded by businesses and residential complexes. Patrons can easily access the square via public transportation (i.e., the MBTA Red Line and bus routes). The square provides bike lanes and racks, and the Kilroy Square Garage for private and commercial vehicle parking. Kilroy Square was determined to be a prime location to help support small businesses as well as to allow patrons easier access to the market. The Chamber focuses heavily on promotion and advertisement of KSFAM. Promotion and advertisement strategies have included a website dedicated to the market, Facebook and Instagram pages, an ad in the Quincy Sun local newspaper, Google Maps search, and signage around the City of Quincy. Increasing awareness of KSFAM supports the goal of providing fresh, healthy, locally sourced food to the community.

According to Mr. Timothy Cahill, Executive Director of the Chamber, the Chamber is hoping to build and expand KSFAM to become the premier farmer market of the South Shore. Aside from promoting the health benefits of healthy nutrition in the City of Quincy, the Chamber of Commerce continues to foster strong relationships with the farmers, vendors, and patrons. Strengthening this network is especially important in continuing to offset the negative economic effects from the COVID-19 pandemic, when local farmers, small businesses, families, and individuals were heavily affected. The Chamber plays an important role in building relationships with the community to help local businesses thrive and supports the concept of building healthy communities.

Methods

The QHD designed a survey instrument (aka the KSFAM survey) targeted at gaining a better understanding of Quincy residents' health concerns and nutritional habits among those that attended the KSFAM. The KSFAM survey included 23 questions regarding demographic information, health conditions, dietary habits, and relationship with food. The survey was available in electronic and paper format in the following languages: English, Traditional Chinese, and Simplified Chinese. While an iPad was available, participants were also able to scan the survey QR code with their phones. The survey was available on the Google Forms platform with English and Chinese versions.

Survey Sample

KSFAM participants composed a convenience sample versus a targeted population or statistically representative sample of Quincy residents. A convenience sample involves a population that is not randomly selected to provide a statistically representative portion of the

population of the area. The KSFAM survey participants were voluntarily recruited. The survey was anonymous, and consent for participation was obtained.

As mentioned, the Quincy Health Department staffed a table in Quincy's KSFAM every Friday, 12pm-5pm between the dates of June 24, 2022, and October 28, 2022. In addition to the survey being available in traditional and simplified Chinese languages, translators from the QHD were also present every Friday to provide assistance for Chinese speaking patrons. QHD staff provided the following free materials to all who visited the QHD table: health education and promotion information on healthy eating habits (English and Chinese versions available), QHD informational brochure, COVID-19 iHealth antigen at-home test kits, N95 masks, hand sanitizer, first aid kits, children's coloring books, QHD promotional event flyers, and water bottles. On July 22, 2022, Walmart donated bottles of water and Gatorade to the QHD table. Visitors at the table that agreed to participate in the survey also received the following: a QHD tote bag with the following included, 2 boxes of COVID-19 iHealth antigen at-home test kits, 5 single N95 masks, QHD plastic reusable water bottle, QHD informational brochure, QHD magnet, and healthy eating handout information.

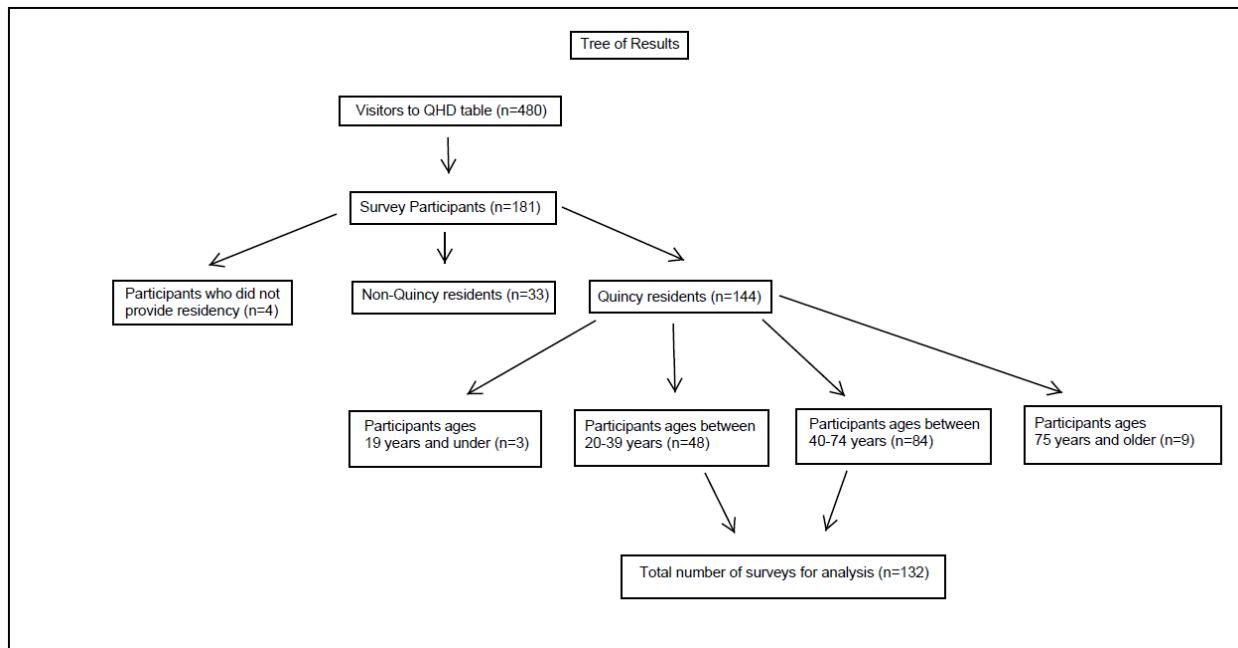
Individuals who were invited to participate in the survey but declined to do so were characterized as the "refusal population". A refusal questionnaire was not provided, however anecdotal information from some individuals suggested that lack of interest in the topic and time constraints were commonly mentioned as reasons for declining participation. The absence of information about the refusal population can lead to biased samples, as those who refuse to participate may differ from those who agree to participate in terms of demographics, health status, or food preferences. For that reason, our sample cannot be generalized to all Quincy resident visitors to the KSFAM.

Data Analysis and Exclusions

Descriptive statistics were analyzed in Microsoft Excel. A total of 480 people visited the QHD table with 38% (n=181) participating in the survey. Of those, approximately 80% (n=144) were Quincy residents, 18% (n=33) were non-Quincy residents, and 2% (n=4) left the residency question blank. The primary purpose of the survey was to pilot test the survey instrument and to understand the demographic and dietary habits of Quincy residents. Ergo surveys from non-Quincy residents were excluded from data analysis. Respondents ages 19 years and under (n=3) as well as ages 75 and older (n=9) were excluded from comparative data analysis due to low participation rates in the survey (see Figure 1).

Figure 1

Tree of Results: Visitors of QHD Table and Survey Participants



Note. Tree of results showing the total number of visitors to the QHD table, the categorization of survey participants and surveys analyzed overall and for comparative purposes.

Results

Visitors of the QHD Table

Staff working at the QHD table made the survey available for 19 weeks from June to October 2022. A total of 480 people visited the QHD table at KSFAM of which 144 were Quincy residents. The minimum number of daily visitors was 10, and the maximum number of visitors on one day was 90 (outlier due to heatwave and availability of water bottles and Gatorade donated by Walmart for patrons), with the second highest maximum being 38. The weekly average of visitors was 25, and the weekly average of survey participants was 9.5. Due to weather conditions, such as heat and rain for certain days during the period that the market was operational, the number of visitors varied.

Characteristics of the Sample

As mentioned, 144 Quincy residents completed the survey in whole or part. A total of 132 complete surveys for Quincy residents were available for comparative analysis. The demographic characteristics of the participants were as follows; participants between the ages of 40-74 years made up 64%, and participants between the ages 20-39 years made up 36% of participants with survey data available for analysis. The majority of participants identified as White/Caucasian (67%), followed by Asian (20%), Black or African American (6%), some other race not specified (5%), and American Indian or Alaska Native (2%). The percentage of female participants was distinctly higher than male participants at 82% and 18%, respectively (see Appendix B).

Survey answers for qualitative, behavioral, and nutritional questions were as follows: among the total of 132 respondents, 27% (n=35) indicated having been told by a doctor to follow

a special dietary plan, and 73% (n=97) indicated never having been told by a doctor to follow a special dietary plan. For the participants who indicated having been told by a doctor to follow a special dietary plan, participants were asked to choose from a list of medical conditions including cardiovascular disease, GERD, Type 2 diabetes, weight loss, other, and a combination of 2 or more of those conditions. Out of 35 respondents who indicated a medical reason for being told by a doctor to follow a special diet, 37% reported medical reasons not listed on the survey, 23% indicated weight loss, 20% indicated a combination of 2 or more of the medical reasons provided, 9% indicated GERD, 6% indicated cardiovascular disease, and 6% indicated type 2 diabetes.

Participants were asked if they follow a special diet for other non-medical reasons such as vegan, pescatarian, and/or religious reasons. Of 132 individuals answering these questions, most (78%, n=103) indicated that they do not follow a special diet for any other non-medical reasons, 20% (n=26) indicated following a special diet for non-medical reasons, and 2% (n=3) did not provide information.

Participants were asked if they had any food allergies, and if so, to what foods. Approximately 17% (n=22) indicated having food allergies, whereas about 83% (n=110) indicated not having food allergies. The food allergy groups included dairy, fruits, non-nutritive sweeteners, protein foods-nuts, protein foods-seafood, spices, vegetables, and a combination of 2 or more of the food allergy groups. For those reporting food allergies (n=21) 24% indicated protein foods-seafood, 19% indicated fruits, 19% indicated protein foods-nuts, 14% indicated a combination of 2 or more of food allergy groups, 10% indicated non-nutritive sweeteners, 5% indicated dairy, 5% indicated vegetables, and 5% indicated spices.

The KSFAM survey also sought information on nutritional behaviors. Nutrition intake questions included the following: when asked how many servings participants ate fresh, canned, frozen, or dried fruit in a day, 39% (n=51) ate 2-3 servings of fruit/day, 34% (n=45) ate 1 serving of fruit/day, and 21% (n=28) ate less than 1 serving of fruit/day. For participants between the ages of 40-74 years, 43% (n=36) ate 2-3 servings of fruit/day and 26% (n=22) ate 1 serving of fruit/day. In comparison, participants between the ages of 20-39 years, 48% (n=23) ate 1 serving of fruit/day followed by 31% (n=15) ate 2-3 servings of fruit/day.

When asked how many servings of fresh, canned, frozen, or dried vegetables participants consumed daily, 42% (n=55) ate 2-3 servings of vegetables/day, 30% (n=40) ate 1 serving of vegetables/day, and 17% (n=23) ate less than 1 serving of vegetables/day. For participants between the ages of 40-74 years, 49% (n=41) ate 2-3 servings of vegetables/day followed by 23% (n=19) ate 1 serving of vegetables/day. In comparison, participants between the ages of 20-39 years, 44% (n=21) ate 1 serving of vegetables/day followed by 29% (n=14) ate 2-3 servings of vegetables/day.

Participants were asked how many sweet foods they ate in a day. For those responding to this question, 49% (n=64) ate less than 1 serving of sweet foods/day and 32% (n=42) ate 1 serving of sweet foods/day. Participants were also asked how many servings of beverages with artificial sweeteners drank a day, 70% (n=92) drank less than 1 serving of sweet beverages/day and 19% (n=25) drank 1 serving of sweet beverages/day. When asked how many cups of water, (about 250mL) 8 ounces participants drank in a day, 35% (n=46) drank 4-6 cups of water per day, 19% (n=25) drank 6-8 cups of water per day, 18% (n=24) drank 2-4 cups of water per day, and 16% (n=21) drank 8+ cups of water per day (more details on all responses to these questions are provided in Appendix C).

Discussion

The findings from this survey demonstrate that the majority of Quincy resident KSFAM participants were female (82%), between the ages of 40-74 (64%), and identified as White (67%). These findings are consistent with other available farmer market survey data. Research by Gumirakiza et. al. (2014) reported that consumers who attend farmer markets tend to be females (although their report specified married females at higher income levels). The survey data characteristics are also somewhat consistent with the Quincy population being that the two most prevalent populations are White and Asian. The majority of survey respondents were White (67%, n=88) followed by Asian respondents (20%, n=26), which is somewhat comparable to the demographics for the City of Quincy as a whole. The findings of the survey suggest that there was an overrepresentation of the White population and an underrepresentation of the Asian population among the Farmer Market patrons. Race and ethnicity data for the City of Quincy show that whites compose approximately 55% of the population while the Asian population compose approximately 31%.

Quincy has a total population of 101,636 people. The majority of the population is between the ages 30-49 years (30.9%) followed by ages 50-64 years (19.6%) and 20-29 years (15.8%). These percentages are generally consistent with ages reported by KSFAM survey participants. The percentage of females living in Quincy is slightly higher than males at 51.2% and 48.8%, respectively. According to the United States Census Bureau (2021), the median household income is \$81,748, and the poverty rate is at 12% among the total population in Quincy. Approximately 38% of individuals residing in Quincy homes speak languages other than English, however the most prevalent languages spoken at home include, English (62.1%), followed by Asian and Pacific Islander languages (24.4%), other Indo-European languages

(8.8%), Spanish (2.8%) and other languages (1.9%) (United States Census Bureau, 2021) (see Appendix A).

While the majority of respondents were not told by a doctor to follow a special diet, most participants who did have a medical reason (n=35) indicated a variety of medical conditions, with weight loss being one of the most prevalent. Weight loss can be recommended for several different medical conditions including but not limiting to obesity, Types 2 diabetes, and cardiovascular disease. According to Massachusetts Behavioral Risk Factor Surveillance Survey (BRFSS) obesity statistics (2011), “More than half of adults and 1 in 4 high school and middle school students in Massachusetts are overweight or obese.” With regard to nutritional intake, three-fourths of adults in Massachusetts are reportedly not eating the recommended 5 or more servings of fruits and vegetables a day according to BRFSS. Quincy KSFAM participants reported eating considerably less compared to Massachusetts residents. These statistics indicate that there is a strong need for better accessibility to healthy food and nutrition guidance.

Approximately 17% of participants indicated having food allergies. This information appears consistent with self-report data available in the literature. A National Institutes of Health study reported a prevalence of 19% of individuals reporting food allergies (JAMA, 2019). Among participants reporting food allergies (n=21), the majority was an allergy to seafood, followed by nuts and fruits. This statistic is comparable to United States data on common food allergies. According to the Food Allergy Research & Education (FARE) (2023), the nine major food allergens – milk, egg, peanut, tree nuts, wheat, soy, fish, crustacean shellfish, and sesame – are responsible for most of the serious food allergy reactions in the United States. Studies published in 2018 and 2019 estimate the number of Americans of all ages who have convincing symptoms of allergy to specific foods to shellfish were 8.2 million, milk was 6.1 million, peanut

was 6.1 million, and tree nuts was 3.9 million (FARE, 2023). Food allergies are on the rise, and there is a need to promote educational materials on common food allergies and when to be aware of reaction symptoms. For individuals who experience food allergies, food disparities can arise when trying to follow a healthy diet or when trying to follow USDA recommended guidelines.

According to the USDA Guidelines (2020), “Americans have fallen far short of meeting its recommendations, and diet-related chronic disease rates have risen to pervasive levels and continue to be a major public health concern”. There is an increased need for more accessible health education and promotion of healthy dietary patterns. Health policies and programs need to promote healthy dietary patterns in order to help reduce chronic disease rates. With the rising chronic disease rates, farmer markets have been an integral part in providing fresh, healthy, locally sourced foods for the community.

The United States Department of Agriculture (USDA) Dietary Guidelines for Americans 2020-2025 is a science-based guideline that helps promote health and reduce chronic disease risk. According to the USDA Dietary Guidelines for Americans 2020-2025, there are four overarching guidelines. The first emphasizes maintaining a healthy dietary pattern throughout all life stages. The second guideline encourages individuals to personalize their food and beverage choices by considering nutrient-dense options that align with their preferences, cultural traditions, and budgetary constraints. The third guideline emphasizes the importance of meeting food group needs through nutrient-dense foods and beverages while staying within recommended calorie limits. Lastly, the fourth guideline advises limiting the consumption of foods and beverages high in added sugars, saturated fat, and sodium, and suggests moderating alcoholic beverage intake. The guidelines include nutrition information and caloric intake recommendations for each stage of life, different age groups, and special populations.

A healthy dietary pattern is key to disease prevention. The guidelines describe the core elements that make up a healthy dietary pattern. The first core element is vegetables of all types—dark green; red and orange; beans, peas, and lentils; starchy; and other vegetables. The second core element is fruits, especially whole fruit. The third core element is grains, at least half of which are whole grain. The fourth core element is dairy, including fat-free or low-fat milk, yogurt, and cheese, and/or lactose-free versions and fortified soy beverages and yogurt as alternatives. The fifth core element is protein foods, including lean meats, poultry, and eggs; seafood; beans, peas, and lentils; and nuts, seeds, and soy products. The sixth core element is oils, including vegetable oils and oils in food, such as seafood and nuts.

Survey questions associated with fruit, vegetables, protein, and dairy consumption allowed for nutritional eating habits to be assessed. For the KSFAM survey, one serving was defined as ½ cup. The majority of participants ate 2-3 servings of fruit (39%) followed by 1 serving (34%) and 2-3 servings of vegetables (72%). It is worthwhile to mention that residents participating in the “older” age groups reported eating fruits more frequently (43% consuming 2-3 times per day among 40-74 versus 31% in the 20-39 year group; similar differences were reported for more frequent vegetable consumption with 49% of the 40-70 consuming 2-3 servings per day versus 29% in the 20-39 age group). Participants ate protein (meat/fish/beans) 2-3 times a day (48%) and ate dairy products 1 time a day (39%) followed by 2-3 times a day (34%). These findings showed that in many cases participants were eating less than the recommended intake as compared to the MyPlate recommendations from the USDA Dietary Guidelines 2020-2025.

MyPlate daily intake recommend that females between ages 19-60+ years consume 1 ½ to 2 cups of fruit, 2 to 3 cups of vegetables, 5 to 6 oz-equivalent of protein, and 3 cups of dairy.

When assessing food group intake, the majority of female survey participants indicated consuming 2-3 servings (1-1 ½ cups) of fruit and 2-3 servings (1-1 ½ cups) of vegetables per day. Female participants indicated consuming dairy products 1 time a day and eating protein (meat/fish/beans) 2-3 times a day. Similar to survey participants as a whole, female survey participants reported consuming less of the recommended daily intakes as outlined by MyPlate.

The male survey group also reported consuming less of the recommended intake as well. MyPlate recommended for males between ages 19-60+ years to consume 2 to 2 ½ cups of fruit, 3 to 4 cups of vegetables, 5 ½ to 7 oz-equivalent of protein, and 3 cups of dairy. When assessing food group intake, the majority of male survey participants indicated consuming less than 1 serving of fruit and 1 serving (1/2 cup) of vegetables per day. Male participants indicated consuming dairy products 2-3 times a day and eating protein (meat/fish/beans) 2-3 times a day. It is important to note that the survey results for how many times a food group was consumed did not indicate a specific serving size making comparisons to MyPlate daily intake recommendations imprecise.

Aside from the main food groups, MyPlate also recommends choosing foods with little to no added sugars, saturated fats, and sodium to help reduce risk of chronic disease for both female and males. According to the USDA Dietary Guidelines (2020) “Americans 2 years and older keep their intake of added sugars to less than 10% of their total daily calories. For example, in a 2,000-calorie diet, no more than 200 calories should come from added sugars (about 12 teaspoons).” In 2017–2018, the average intake was 19 teaspoons for men and 15 teaspoons for women (CDC, 2021).

When assessing food and beverages with added sugars, the majority of female and male KSFAM participants indicated eating sweet foods (e.g., chocolate, candy, or ice cream) less than

1 time a day (48%) and drinking beverages with artificial sweeteners less than 1 time a day (70%). As mentioned earlier, the survey results for how many times a day participants indicated eating sweet foods or drinking beverages with artificial sweeteners did not indicate a specific caloric intake or serving size of added sugars, making comparisons to MyPlate intake recommendations imprecise.

When assessing water intake, approximately one-third of participants for both male and female groups indicated drinking 4-6 cups (1 cup defined as 8 ounces) of water a day. According to the Harvard T.H Chan School of Public Health and the National Academy of Medicine (n.d.), females aged 19 years or older are recommended to drink 9 cups (72 ounces) of water a day and 13 cups (104 ounces) for males aged 19 years or older. Again, survey data show that neither females or males are consuming water consistent with this recommendation. It is important to note that daily water consumption would vary depending on disease states, weather, exercise, and other environmental and physiological factors (Harvard T.H Chan School of Public Health, n.d.).

Limitations

As with most survey efforts, this study had some limitations. First, the small sample size of 132 participants was a convenience sample making generalizable comparisons to the City of Quincy residents as a whole limited. The use of convenience sampling may introduce bias as it solely relies on individuals who are readily available and willing to participate, potentially leading to an inadequate representation of the wider population's views or behaviors. While the survey utilized a convenience sample the general demographic characteristics of the survey participants indicate that the survey population generally resembles the City of Quincy with its representative populations. The majority racial/ethnic groups in Quincy are White and Asian

populations, which were the two major groups who participated in the survey. Although the survey used a convenience sample, the sample was similar to other published farmer market survey data. Another important limitation was that the survey did not characterize the refusal population. Better characterization of a refusal population is critical in determining the validity and generalizability of research findings because researchers are unable to determine factors associated with participants in a survey allowing for bias to be introduced. Characterization of the refusal population would have helped to better understand how similar survey respondents were in terms of demographics, views, and behaviors of Quincy residents as a whole.

Conclusions

The findings of the KSFAM Survey serve as a tool to better understand demographic patterns and dietary habits among residents of Quincy, Massachusetts who attended the Farmers Market. It is one of the first surveys performed on a local level to help assess nutrition and dietary patterns among residents of a community. Survey results emphasize the need for public health interventions that target adults aged 20-74 years, and particularly those in the 20-39 year old age groups when prevention and health promotion activities are critical in chronic disease reduction. As indicated in many cases, the participants' consumption of all food groups was not optimal in relation to the recommended USDA Dietary Guidelines. Information available on medical conditions highlights the need to make educational materials more available and to inform health and nutrition policy.

Overall, there was an overrepresentation of females and residents reporting their race as White, however this data is consistent with published data on individuals who attend farmer markets. While the percentage of the Asian population in Quincy is higher than KSFAM survey respondents, it is still the second largest ethnic group to attend the KSFAM. These findings

suggest that public health interventions should focus on promoting healthy foods and nutrition education for all residents, notably those with expressed health concerns such as type 2 diabetes and cardiovascular disease.

According to the CDC Diagnosed Diabetes Surveillance of Norfolk County, MA (2020), 7.1% of adults aged 20 years and older were diagnosed with diabetes. The United Health Foundation (2023) reported 7.3% of adults in Massachusetts who were diagnosed by a health professional as having angina or coronary heart disease; a heart attack or myocardial infarction; or a stroke. Overall, the survey provides important insights into health and nutritional behaviors among residents of the City of Quincy and critical public health implications on a local level. Further research is recommended to understand the dietary habits and nutrition patterns on a larger scale within the City of Quincy.

Public Health Implications and Recommendations

Results from this survey suggest the need to make targeted informational materials about disease and nutrition more available, implementing community outreach services for better nutritional guidance, and promotion of educational materials and community resources from the Quincy Health Department. Given that 38% of Quincy residents report speaking languages other than English at home, it would be ideal to provide educational materials in Traditional and Simplified Chinese languages. Quincy's Kilroy Square Farmers and Artisans Market serves as an important resource for the community providing readily fresh, healthy, locally sourced food products and a convenient venue for distribution of educational materials. Collaborations between the Chamber of Commerce and the Quincy Health Department allow for both the development of and optimal distribution of education materials emphasizing the role that nutrition plays in disease prevention.

Other community organizations that provide important collaboration with local health officials include Manet Community Health Center (Manet CHC) and Quincy Asian Resources Inc. (QARI). Manet CHC has been an integral part in maintaining the health of Quincy residents. Manet has multiple departments that provide services for patients with one of the notable departments being Nutrition Services. Research and data from Nutrition Services can help with further understanding of the patient population and the dietary needs of recipients.

Quincy Asian Resources Inc. (QARI) is a community social services agency whose “mission is to foster and improve the social, cultural, economic and civic lives of immigrants and their families in order to benefit their communities” (QARI, n.d.). According to University of Massachusetts Boston (2020), the City of Quincy is home to the second largest population of Asian residents in the Commonwealth of Massachusetts, with Boston being first, however Quincy has the highest proportion of Asian residents among all Massachusetts municipalities. QARI creates strong relationships with the community to foster healthier living. Currently, the QHD has a health education and promotion program in partnership with QARI. One of the classes provided is focused on the topic of nutrition, allowing QHD staff to speak directly with residents about healthy nutrition habits and the disparities the Asian population faces with respect to nutrition.

Promoting better dietary practices and outcomes within communities depends on community members having access to public health resources, such as education, wholesome food options, and community programming. Partnerships with local organizations and agencies are essential because they enable public health officials to engage with residents more readily, resulting in more effective and efficient interventions that are suited to the needs of the community. Providing culturally appropriate nutrition guidance can help foster relationships

among the different racial and ethnic groups in Quincy. These partnerships allow for further insight and planning of community-based nutrition programs, campaigns promoting healthy food choices, and educational workshops on the importance of a healthy diet.



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Appendix A

Appendix A. Demographics of City of Quincy, Massachusetts

Demographics Characteristics	n (%)
Total Population	101,636
Age Group (years)	
0-4 Years	4,836 (4.8)
5-11 Years	5,863 (5.8)
12-15 Years	3,318 (3.3)
16-19 Years	3,257 (3.2)
20-29 Years	16,099 (15.8)
30-49 Years	31,448 (30.9)
50-64 Years	19,935 (19.6)
65-74 Years	9,368 (9.2)
75+ Years	7,508 (7.4)
Race/Ethnicity	
American Indian/Alaska Native	122 (0.1)
Asian	31,345 (30.8)
Black	5,637 (5.5)
Hispanic	5,204 (5.1)
Multi	3,596 (3.5)
Native Hawaiian/Pacific Islander	22 (0.02)
White	55,708 (54.8)
Gender	
Female	52,059 (51.2)
Male	49,576 (48.8)

Appendix A: Population Estimates 2011-2019, version 2020, Massachusetts Department of Public Health, Bureau of Environmental Health.

Appendix B

Appendix B. Demographics of Quincy Resident Survey Participants

Demographics Characteristics	n (%)
Total Number of Participants	144
Age Group (years)	
Less than or equal to 19	3 (2.1)
20-39	48 (33.3)
40-74	84 (58.3)
Greater than or equal to 75	9 (6.3)
Race/Ethnicity	
American Indian or Alaska Native	2 (1.4)
Asian	26 (18.0)
Black or African American	10 (6.9)
Some other race	7 (4.9)
White/Caucasian	98 (68.1)
Left Blank	1 (0.7)
Gender	
Female	119 (82.6)
Male	24 (16.7)
Prefer not to answer	1 (0.7)

Appendix B. Demographics of Quincy Resident Survey Participants represent the demographic variables and the frequency (percent) of the participants from the City of Quincy Farmers Market Nutrition Pilot Survey.

Appendix C

Appendix C. Frequency Distribution for Qualitative, Behavioral, and Nutritional Survey Questions

Qualitative Question	Frequency	Percentage (%)
Have you ever been told by a doctor to follow a special dietary plan?		
• Yes	35	26.5
• No	97	73.5
If yes, please select one of the following medical reasons:		
• cardiovascular disease	2	5.7
• GERD	3	8.6
• Type 2 diabetes	2	5.7
• weight loss	8	22.9
• other	13	37.1
• combination of 2 or more of the following conditions	7	20.0
Do you follow a special diet for any other reason? (e.g., vegetarian, vegan, pescatarian, religious reasons)		
• Yes	26	19.7
• No	103	78.0
• Blank	3	2.3
Do you have any food allergies?		
• Yes	22	16.7
• No	110	83.3
If yes, can you say which foods?		
• Dairy	1	4.8
• fruits	4	19.1
• Non-nutritive sweeteners	2	9.5
• Protein foods-nuts	4	19.1
• protein foods-seafood	5	23.8
• spices	1	4.8
• vegetables	1	4.8
• combination of 2 or more of the food allergy groups	3	14.3
How would you describe your diet?		
• Excellent	4	3.0

• Very Good	25	18.9
• Good	50	37.9
• Fair	45	34.1
• Poor	8	6.1
How would you describe your relationship with food?		
• Healthy	105	79.5
• Unhealthy	26	19.7
• Blank	1	0.8
Behavioral Questions	Frequency	Percentage (%)
How many meals do you eat a day (breakfast, lunch, dinner, snacks)? Consider every fruit, every yogurt, or a glass of milk etc. as a single snack.		
• 1-2 meals	37	28.0
• 3-4 meals	79	59.9
• 5-6 meals	16	12.1
How many meals per day do you eat that are prepared at-home?		
• Less than 1 time	11	8.3
• 1 time	23	17.4
• 2-3 times	75	56.8
• 4-5 times	19	14.4
• 6+ times	3	2.3
How many times a day do you eat fast/fried food/or packaged snacks high in fat/salt/or sugar?		
• Less than 1 time	78	59.1
• 1 time	37	28.0
• 2-3 times	15	11.4
• 4-5 times	2	1.5
• 6+ times	0	0
How many times a day do you eat regular (not low-fat) snack chips or crackers		
• Less than 1 time	73	55.3
• 1 time	46	34.8
• 2-3 times	13	9.9
• 4-5 times	0	0
• 6+ times	0	0
How many times a day do you eat dairy products (milk,		

unsweetened yogurt, low-fat cheese)?		
• Less than 1 time	31	23.5
• 1 time	51	38.6
• 2-3 times	45	34.1
• 4-5 times	4	3.0
• 6+ times	1	0.8
How many times a day did you eat meat/fish/beans?		
• Less than 1 time	14	10.6
• 1 time	52	39.4
• 2-3 times	63	47.7
• 4-5 times	3	2.3
• 6+ times	0	0
Nutritional Questions	Frequency	Percentage (%)
How many servings (1 serving = 1/2 cup) of fresh, canned, frozen, or dried fruit do you eat in a day?		
• Less than 1 serving	28	21.2
• 1 serving	45	34.1
• 2-3 servings	51	38.6
• 4-5 servings	6	4.6
• 6+ servings	2	1.5
How many servings of fresh, canned, frozen, or dried vegetables do you eat in a day?		
• Less than 1 serving	23	17.4
• 1 serving	40	30.3
• 2-3 servings	55	41.7
• 4-5 servings	11	8.3
• 6+ servings	3	2.3
How many sweet foods (e.g., chocolate, candy, or ice cream) do you eat in a day?		
• Less than 1 serving	64	48.5
• 1 serving	42	31.8
• 2-3 servings	25	18.9
• 4-5 servings	1	0.8
• 6+ servings	0	0
How many beverages with artificial sweeteners (sodas, sweet tea, juice, energy/sports drinks, sweetened coffee, or other sugar-sweetened		

beverages) do you drink in a day?		
• Less than 1 serving	92	70.2
• 1 serving	25	19.1
• 2-3 servings	9	6.9
• 4-5 servings	4	3.0
• 6+ servings	1	0.8
How many cups, 8 ounces (about 250mL) of water do you drink in a day?		
• Less than 1 cup	2	1.5
• 1-2 cups	14	10.6
• 2-4 cups	24	18.2
• 4-6 cups	46	34.9
• 6-8 cups	25	18.9
• 8+ cups	21	15.9

Appendix C: Frequency distribution of qualitative, behavioral, and nutritional question responses from Quincy resident participants.

