

# Support Among U.S. Adults for Local and State Policies to Increase Fruit and Vegetable Access

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**Background:** Few American children or adults meet national objectives for consumption of both fruits and vegetables (FV). State and local policies that support community access to FV can help support individuals and families in having easier access to FV for purchase and ultimately consumption.

**Purpose:** To assess U.S. adult support for state and local policies designed to increase community-level access to FV.

**Methods:** Data were analyzed from the 2008 HealthStyles survey of U.S. adults (N=5181), in which participants were asked how likely they would be to support four types of changes to local or state policies: those that would create farmers' markets and community gardens, or increase FV offerings in small stores and public sector venues. Respondents' answers were collapsed into three categories ("supportive," "neutral," and "unsupportive"); the prevalence of support for each type of policy was determined, and logistic regression was used to calculate ORs for support of each by selected demographic variables.

**Results:** Overall, 62.1% supported farmers' markets, 57.7% supported the public sector, 54.3% supported small stores, and 47.2% supported community garden policies. Support for policy changes was relatively high among women, Hispanics, and non-Hispanic blacks.

**Conclusions:** Although some variation in support exists, the majority of Americans support state or local policy changes designed to increase community access to FV. Future research should augment this work by including questions on willingness to pay, trade-off methods, or referendum-style questions to inform priorities among FV policy initiatives.

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## Background

A balanced diet high in fruits and vegetables (FV) has been associated with a reduced risk for several leading causes of death and found to play a role in weight management<sup>1,2</sup>; however, few children and adults consume recommended amounts.<sup>3,4</sup> Residence in neighborhoods with poor access to healthier foods such as FV has been associated with poorer diet quality, obesity, and chronic disease.<sup>5,6</sup> Improving access and promotion of a wide variety of affordable, high-

quality FV may allow families to choose and consume more FV.<sup>7</sup> Policy and environmental approaches to increase consumption include expanding farm-to-consumer programs in venues such as farmers' markets; improving access to and products sold in retail venues (stores); ensuring ready access to FV in worksite food service; and supporting community gardens.<sup>5,8,9</sup> Few policies are documented to currently exist that address FV access.<sup>10</sup>

Although policies could help improve U.S. adult access to FV, such policies may not be developed or enacted without evidence of effectiveness and/or public backing.<sup>11</sup> To the authors' knowledge, the degree of support for local or state policy changes designed to increase FV access has not been previously assessed on a national scale. The present study therefore assessed U.S. adult support for policies that may increase community-level FV access and tested for differences by sociodemographic characteristics.

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## Methods

The 2008 HealthStyles consumer panel survey of U.S. adults aged  $\geq 18$  years was used for this study. The Styles surveys were developed by Porter Novelli, a social marketing and public relations firm, with input from agencies including the CDC, which aided in survey-question development. Styles 2008 is a population-based market research survey administered in two waves. The first, ConsumerStyles, is a survey about general media habits, product use, interests, and lifestyle. The second survey, HealthStyles, focuses on health orientations and practices. The sampling and data collection are conducted by Synovate, Inc., an international research company, which recruits and maintains a demographically representative panel of 340,000 individuals who have agreed to participate in periodic mail surveys. Demographic data were collected at the time of recruitment into the panel.

From May through June 2008, the ConsumerStyles survey was mailed to a stratified random sample of 20,000 panel members; 10,108 returned the survey (response rate=51%). From those, a random sample of 7000 was chosen to receive the second-wave HealthStyles survey from July through August 2008. The main sample ( $n=5500$ ) was balanced as to age, gender, marital status, race/ethnicity, region, household size, and population density. In addition to the main sample, a low-income/minority supplementary sample ( $n=1500$ ) was oversampled to ensure adequate representation of this group. Data on degree of policy support were collected as part of the HealthStyles survey. Responses were received from 5399 individuals (response rate=77%).

Participants were asked to indicate on a 5-point Likert-type scale (*very likely*, *likely*, *neutral*, *unlikely*, or *very unlikely*) how likely they would be to support changes to local or state policies that would do each of the following: (1) create local community markets or farmers' markets; (2) create a program that helps small food stores have fresh FV; (3) create community gardens or plots for raising FV; and (4) require city/county government agencies to favor the purchase of locally grown FV to serve in cafeterias and at meetings (i.e., policies that increase FV in public sector venues).

## Statistical Analysis

Frequencies of being supportive (*very likely* and *likely*); neutral; and unsupportive (*unlikely* and *very unlikely*) were assessed overall and by demographic characteristics (Table 1), including region of the U.S. (based on Census Bureau divisions)<sup>12</sup> and population density (nonmetro, metro  $<500,000$ ; metro 500,000–1,999,999; metro  $\geq 2,000,000$ ). Logistic regression was used to test for associations and determine AORs and 95% CIs of being supportive versus neutral/unsupportive by demographic subgroups. Population density was included in the final adjusted model; however, the results are not presented because of little variation in support.

A weighting variable was used so that results reflected U.S. Census proportions based on the 2007 Current Population Survey. Respondents who had missing data for any question about proposed changes or selected demographics were excluded ( $n=218$ ). The final analytic sample included 5181 individuals. Data were analyzed with SAS, version 9.2, using appropriate methods to account for the sampling design.

## Results

The overall prevalence of support for the proposed policy changes intended to increase FV access ranged from 47.2% to 62.1%; further, 25.0%–29.5% of respondents were neutral toward the proposed changes, and 12.3%–23.3% were unsupportive (Figure 1). Support was highest for farmers' markets policies (62.1% overall; range by demographic subgroup=55.5%–67.6%), followed by public sector policies (57.7%; range=49.5%–67.7%); small stores (54.3%, range=43.9%–64.3%); and community gardens (47.2%, range=38.0%–57.9%; Table 1). Variation in support was found among subgroups.

Adjusted logistic regression results showed women to be more supportive of farmers' markets and public sector policies than men (Table 2). Compared to non-Hispanic whites, Hispanics were more likely to support small stores, public sector, and community gardens policies, and non-Hispanic blacks were also more likely to be supportive of small stores and community gardens policies. Lower-income subgroups tended to be more supportive compared to those with a household income  $\geq \$85,000$ , especially for small stores and community gardens policies. College graduates were more supportive of farmers' markets policies than all other education categories. Finally, as compared to residents in the Pacific region, those who were more supportive were residents of the Middle Atlantic, South Atlantic, and East South Central region; prevalence of support was also high across strategies in the West South Central region.

## Discussion

Americans generally favored policy changes to increase community FV access, with some options being more popular than others such as farmers' markets. Across subgroups, almost half or more were supportive of FV access policies. Few respondents were unsupportive, and most respondents who did not support these policies were neutral rather than unsupportive. They represent a group that may with further information formulate an opinion on these policies. Even though policymakers may consider policy change, many have noted that such changes are unlikely to be implemented without political will and popular support.<sup>11</sup> As the findings of the present study indicate substantial public support for FV policies exists, increased FV access through policy change may be one approach to improve diet and reduce obesity and risk for chronic disease.

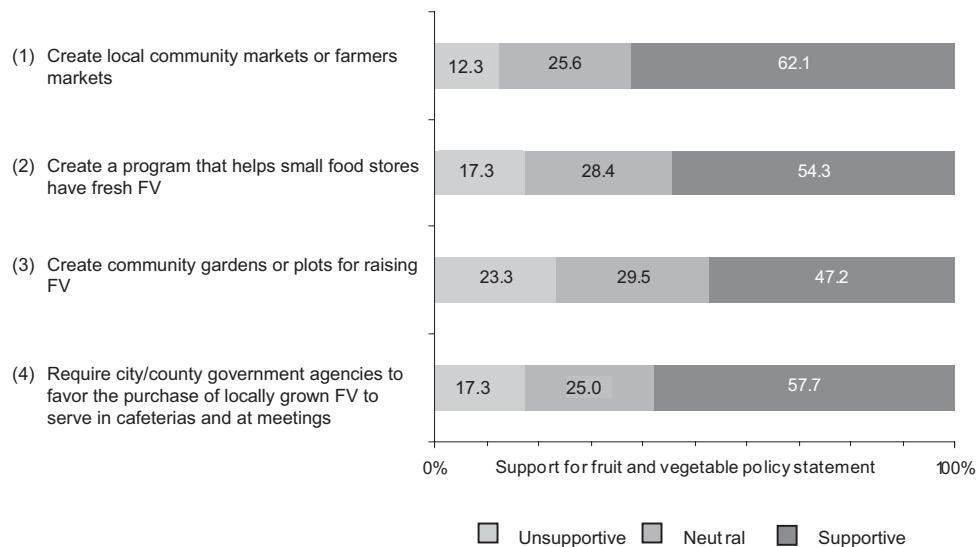
Some variation in support existed by demographic factors. In general, findings indicated that support for policy changes was relatively high among women, blacks and Hispanics, younger adults, people with lower incomes, and residents of the East South Central, West South

**Table 1.** Percentage of U.S. adults who were unsupportive, neutral, and supportive of fruit and vegetable policy changes by demographic characteristics, HealthStyles 2008 survey

Demographic characteristics	Total n (%)	Farmers' markets			Small stores			Community garden			Public sector		
		U	N	S	U	N	S	U	N	S	U	N	S
Total	5181 (100)	12.3	25.6	62.1	17.3	28.4	54.3	23.3	29.5	47.2	17.3	25.0	57.7
<b>Gender</b>													
Female	2877 (55.5)	10.7	24.6	64.7	15.4	28.0	56.6	20.8	30.0	49.2	14.1	25.5	60.4
Male	2304 (44.5)	14.0	26.6	59.4	19.5	28.8	51.8	26.0	28.9	45.1	20.8	24.5	54.7
<b>Age (years)</b>													
18–34	633 (12.2)	12.7	28.1	59.1	15.9	27.6	56.5	19.8	31.9	48.3	14.9	25.6	59.6
35–44	1045 (20.2)	10.2	25.4	64.4	15.4	28.9	55.7	21.3	31.0	47.8	15.2	24.9	59.9
45–54	1587 (30.6)	12.4	25.1	62.5	17.3	29.7	53.0	21.8	29.2	49.0	16.6	26.5	57.0
55–64	957 (18.5)	11.4	22.7	65.9	18.0	27.4	54.6	24.5	28.3	47.1	18.9	25.0	56.1
≥65	959 (18.5)	14.4	24.4	61.2	21.8	28.5	49.7	33.3	24.5	42.2	24.1	22.2	53.7
<b>Race/ethnicity</b>													
Non-Hispanic black	639 (12.3)	7.4	30.6	62.0	8.6	27.1	64.3	14.3	28.4	57.3	8.1	29.8	62.0
Hispanic	629 (12.1)	12.5	25.6	62.0	14.4	25.4	60.2	17.4	24.7	57.9	12.8	22.6	64.6
Other	381 (7.4)	11.0	26.7	62.2	15.0	29.9	55.0	20.9	26.6	52.5	16.4	30.5	53.1
Non-Hispanic white	3532 (68.2)	13.2	24.6	62.2	19.6	29.0	51.4	26.2	30.9	42.9	19.9	24.2	56.0
<b>Household income (\$)</b>													
<25,000	1373 (26.5)	15.2	27.1	57.8	16.4	23.8	59.8	21.3	27.4	51.3	16.7	22.1	61.2
25,000–59,999	1117 (21.6)	10.6	25.2	64.2	16.1	29.1	54.8	23.2	27.5	49.3	14.4	26.5	59.1
60,000–84,999	1299 (25.1)	10.6	25.1	64.3	17.1	28.7	54.2	22.6	32.6	44.9	17.2	24.0	58.9
≥85,000	1392 (26.9)	12.8	25.2	62.0	20.0	31.9	48.1	26.3	30.4	43.3	21.3	27.6	51.1
<b>Education</b>													
Less than high school	342 (6.6)	13.0	31.5	55.5	14.6	30.6	54.9	16.8	33.0	50.2	11.8	24.5	63.8
High school graduate	1323 (25.5)	15.2	28.5	56.3	17.3	28.8	54.0	26.6	27.6	45.9	17.7	24.1	58.2
Some college	1924 (37.1)	11.1	26.1	62.8	16.1	27.8	56.1	21.0	31.0	48.1	15.9	24.7	59.4
College graduate	1592 (30.7)	11.4	21.8	66.8	19.4	28.3	52.2	25.1	28.4	46.5	19.8	26.1	54.0
<b>Region</b>													
New England	168 (3.2)	16.8	25.9	57.3	20.6	35.0	44.4	29.5	28.5	41.9	25.4	25.0	49.5
Middle Atlantic	784 (15.1)	9.8	25.8	64.4	12.4	29.4	58.2	23.1	24.9	52.0	14.2	24.1	61.7
East North Central	875 (16.9)	13.9	26.3	59.8	18.4	24.5	57.1	23.6	31.8	44.6	18.5	23.3	58.2
West North Central	338 (6.5)	18.5	21.8	59.7	22.6	29.6	47.7	23.6	29.1	47.4	21.0	26.7	52.3
South Atlantic	1008 (19.5)	8.9	25.5	65.6	13.9	30.3	55.8	21.7	31.5	46.8	16.6	26.4	57.0
East South Central	326 (6.3)	8.8	23.5	67.6	13.8	24.5	61.7	19.5	27.5	52.9	11.7	20.6	67.7
West South Central	546 (10.5)	10.1	26.1	63.8	13.2	26.5	60.3	21.1	25.3	53.5	14.3	24.6	61.2
Mountain	400 (7.7)	16.4	27.9	55.7	22.8	26.9	50.3	27.9	34.1	38.0	22.1	25.4	52.5
Pacific	736 (14.2)	14.5	25.8	59.7	24.9	31.2	43.9	24.5	30.7	44.8	18.7	27.9	53.4

Note: Proportions are weighted. Weighting variable is based on gender, age, income, race, and household size so that results reflected U.S. Census proportions based on the 2007 Current Population Survey.

N, neutral; S, supportive; U, unsupportive



**Figure 1.** Proportion of support for each statement about FV access policies

Note: Respondents were asked: *How likely would you be to support changes to local or state rules or policies that would do each of the following?*  
FV, fruits and vegetables

Central, and Middle Atlantic regions. Some subgroups with relatively high support for policy changes were the same subgroups who have been found to have lower FV consumption and/or access.<sup>3,5</sup> Policies aimed to increase affordable FV access, though potentially beneficial to all Americans, may be most useful for disparate populations.

Policy support may have differed had respondents been provided with descriptions and potential benefits or actions for each policy approach. Farmers' markets provide economic opportunity, link urban and rural economies, promote public health, create active public space, and bring together diverse people.<sup>13</sup> Supporting the creation of farmers' markets with subsidies and zoning policies provides increased FV offerings. Also, benefits of farmers' markets may be extended for low-income people, who may have lower vegetable consumption,<sup>3</sup> by policies that encourage markets to install Electronic Benefits Transfer machines, accept Supplemental Nutrition Assistance Program benefits, and establish programs that offer voucher coupons for FV purchase.<sup>14</sup> Policies that increase FV in small stores such as smaller convenience stores, corner stores, and specialty stores have been another approach to improve FV access, especially in food deserts. Policymakers can support and promote state policies that offer healthy-food retailers incentives like tax exemptions and credits,<sup>15</sup> improve transportation to these venues, upgrade store facilities to carry more forms of FV, and increase supply and shelf space dedicated to quality and affordable FV.<sup>10</sup> Additionally, policies supporting community gardens can increase FV consumption through education and engagement as well as access for some individuals because of proximity. Policymakers can examine and modify existing zoning regulations

relevant to community gardens and/or develop new regulations as necessary. Finally, policies designed to increase FV purchase in government worksites can support production of locally grown FV, improve access for workers, and serve as a model for other worksites. Food-service and meetings' policies may be established to promote FV, require a certain proportion of FV, or encourage preferential pricing for FV. Those who are employed spend an average of 7.5 hours working daily<sup>16</sup>; thus, a substantial portion of food may be consumed at work.

Previous studies on support for public health policies related to chronic disease can be informative for FV policy research. Support for breastfeeding policies in various settings ranges from 27% to 52% among Americans overall; support was generally higher among African Americans and those with lower household incomes.<sup>17</sup> Support for a tax on sugary drinks ranges from 37% to 72%; support was highest when respondents were told the revenue would be used for obesity prevention.<sup>18</sup> Thus, the level of support in the current study is at a prevalence that might be expected for public health policies, subgroups indicating support were similar across studies, and explanations can increase support. In another study<sup>19</sup> on public opinion, the U.S. regions with the highest level of support for workplace breastfeeding policies also had high levels of public knowledge about breastfeeding and positive attitudes toward it. Additionally, longitudinal study results have shown that implementation of smoking restrictions in public places tended to be more comprehensive in areas with more favorable attitudes and strong support for comprehensive regulations.<sup>20</sup> Findings suggest that among people who understand the

**Table 2.** Odds of supporting<sup>a</sup> fruit and vegetable policy changes among U.S. adults by demographic characteristics, AOR (95%CI)

Demographic characteristics	Farmers' markets	Small stores	Community garden	Public sector
<b>Gender</b>				
Female	1.29 (1.08, 1.53) <sup>b</sup>	1.14 (0.96, 1.36)	1.09 (0.93, 1.29)	1.22 (1.03, 1.45) <sup>b</sup>
Male (ref)	—	—	—	—
<b>Age (years)</b>				
18–34	0.85 (0.65, 1.11)	1.13 (0.86, 1.48)	1.12 (0.86, 1.46)	1.12 (0.85, 1.48)
35–44	1.07 (0.86, 1.32)	1.19 (0.97, 1.46)	1.18 (0.96, 1.45)	1.23 (1.00, 1.51)
45–54	1.04 (0.86, 1.25)	1.15 (0.96, 1.38)	1.34 (1.11, 1.61) <sup>b</sup>	1.16 (0.96, 1.39)
55–64	1.20 (0.98, 1.47)	1.20 (0.99, 1.47)	1.23 (1.01, 1.50)	1.10 (0.90, 1.34)
≥65 (ref)	—	—	—	—
<b>Race/ethnicity</b>				
Non-Hispanic black	0.93 (0.69, 1.25)	1.48 (1.09, 2.00) <sup>b</sup>	1.59 (1.20, 2.11) <sup>b</sup>	1.13 (0.84, 1.52)
Hispanic	1.10 (0.82, 1.46)	1.49 (1.14, 1.94) <sup>b</sup>	1.84 (1.41, 2.40) <sup>b</sup>	1.40 (1.07, 1.83) <sup>b</sup>
Other	1.03 (0.74, 1.43)	1.30 (0.94, 1.79)	1.53 (1.09, 2.15) <sup>b</sup>	0.96 (0.68, 1.34)
Non-Hispanic white (ref)	—	—	—	—
<b>Household income (\$)</b>				
<25,000	1.00 (0.77, 1.29)	1.47 (1.13, 1.90) <sup>b</sup>	1.37 (1.07, 1.77) <sup>b</sup>	1.28 (0.99, 1.65)
25,000–59,999	1.26 (0.99, 1.61)	1.23 (0.98, 1.55)	1.28 (1.02, 1.61) <sup>b</sup>	1.23 (0.98, 1.55)
60,000–84,999	1.21 (0.98, 1.49)	1.26 (1.02, 1.54) <sup>b</sup>	1.09 (0.89, 1.34)	1.30 (1.06, 1.60) <sup>b</sup>
≥85,000 (ref)	—	—	—	—
<b>Education</b>				
Less than high school	0.62 (0.40, 0.97) <sup>b</sup>	0.83 (0.53, 1.32)	0.89 (0.57, 1.37)	1.25 (0.80, 1.97)
High school graduate	0.59 (0.48, 0.74) <sup>b</sup>	0.88 (0.71, 1.10)	0.86 (0.69, 1.07)	1.04 (0.83, 1.29)
Some college	0.80 (0.65, 0.99) <sup>b</sup>	1.02 (0.83, 1.25)	0.96 (0.79, 1.18)	1.12 (0.91, 1.37)
College graduate (ref)	—	—	—	—
<b>Region</b>				
New England	0.93 (0.55, 1.57)	1.11 (0.69, 1.80)	1.03 (0.64, 1.66)	0.84 (0.50, 1.41)
Middle Atlantic	1.28 (0.94, 1.76)	1.86 (1.36, 2.55) <sup>b</sup>	1.46 (1.08, 1.99) <sup>b</sup>	1.42 (1.03, 1.95) <sup>b</sup>
East North Central	1.05 (0.76, 1.44)	1.70 (1.25, 2.31) <sup>b</sup>	1.07 (0.79, 1.45)	1.15 (0.84, 1.57)
West North Central	0.98 (0.66, 1.45)	1.18 (0.80, 1.75)	1.26 (0.85, 1.85)	0.92 (0.63, 1.36)
South Atlantic	1.33 (1.01, 1.75) <sup>b</sup>	1.59 (1.21, 2.09) <sup>b</sup>	1.11 (0.85, 1.46)	1.11 (0.84, 1.46)
East South Central	1.45 (0.93, 2.24)	1.95 (1.30, 2.93) <sup>b</sup>	1.43 (0.96, 2.13)	1.64 (1.08, 2.49) <sup>b</sup>
West South Central	1.21 (0.88, 1.65)	1.80 (1.32, 2.44) <sup>b</sup>	1.34 (0.99, 1.82)	1.20 (0.88, 1.65)
Mountain	0.81 (0.57, 1.14)	1.27 (0.89, 1.82)	0.76 (0.54, 1.06)	0.89 (0.62, 1.26)
Pacific (ref)	—	—	—	—

Note: Logistic regression model adjusted for gender, age, race/ethnicity, household income, education, region, and population density.

<sup>a</sup>Odds of supporting (versus neutral or unsupportive)

<sup>b</sup>95% CI does not include 1

rationale for implementing policies and experience the benefits, public support and compliance increases over time.<sup>20</sup> Lastly, results of a study among officers responsible for enforcing laws restricting youth access to tobacco showed that those who supported the laws were more likely to enforce them.<sup>21</sup> The success of policies designed to increase public access to FV may similarly depend on the support of those charged with implementing the policies.

The data analyzed in the current study did not include questions on how much respondents would be willing to pay for policy initiatives. Other areas of study such as gun control and health insurance have used the approach of public economics such as contingent valuation.<sup>22</sup> However, no other studies were found that had this information specific to FV policies to help interpret the findings of the present study. Future research could benefit from this type of assessment.

Key components of a contingent-valuation study that would help the likelihood of producing reliable results<sup>23</sup> include the use of referendum formats that ask respondents to vote on a hypothetic government program; for example: *Suppose that you were asked to vote for or against a new program in your state to increase FV offerings. This program would make it easier for families to purchase quality produce. It would improve diets and help reduce obesity by X%, but taxes would be increased to pay for it. If it would cost you an extra \$X in annual taxes would you vote for or against this new program?* Other techniques that could be tried include: trade-off methods (whether a person values A over B [e.g., a farmers' market over a community garden]) or establishing a basic budget and using that context with questions such as, *Would you be willing to pay \$X for a farmers' market?* It should be noted that some economic researchers have trepidation about contingent-valuation research overall in that respondents have no incentive to take questions seriously because they relate to theoretic situations.

## Limitations

This study had limitations. As discussed, there was no elaboration on questions or definitions for respondents who were unfamiliar with FV access policies. Further, the questionnaire did not explore if respondents would take monetary or nonmonetary actions to support policy development, such as joining a coalition, writing their congressman, or submitting an editorial. In addition, there are limitations in the survey approach. Although the sample was selected randomly from a stratified consumer panel, this sampling design may have certain nonrandom characteristics that affect its representativeness of the general U.S. population. However, the strength of the sample is that it is population-based, has an adequate

sample size to stratify, and is weighted to represent the distribution of the U.S. population. Additionally, the survey questions are novel and this may be the first nationwide survey to assess popular support for FV access policies.

## Conclusion

This snapshot of Americans' opinions found almost half supporting various state or local policy changes to increase community access to FV. Further research on inclusion of costs and willingness to pay or through a referendum approach could benefit this area of policy research.

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