

THE IMPACT OF A SCHOOL GARDEN ON FRUIT AND VEGETABLE AVAILABILITY AT
HOME FOR ELEMENTARY CHILDREN

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ABBREVIATIONS

CFISD	Cypress-Fairbanks Independent School District
FJV	Fruit, Juice, and Vegetables
FV	Fruit(s) and Vegetable(s)
LGEG	Learn, Grow, Eat, Go!
NCI	National Cancer Institute
NE	Nutrition Education
NE&G	Nutrition Education Plus Garden
NHANES	National Health and Nutrition Examination Survey
TGEG	Texas Grow! Eat! Go!
US	United States
USDA	United States Department of Agriculture

ABSTRACT

MICHAELA SOSSAMON

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The primary purpose of this study was to explore the impact of a school garden on the home availability of FV and on household food security of elementary children. A secondary aim of the study was to examine the impact of both the school garden and parental FV consumption on children's FV preferences and consumption. Nine third-grade students completed this study. T-tests and ANOVA assessed changes in outcomes before and after the school-garden program. Associations between the school-garden program, parental FV consumption, and children's FV preferences and consumption were also examined. Results showed that vegetable consumption of parents was significantly associated with vegetable availability at home ($p = 0.003$) and vegetable consumption of children ($p = 0.01$) at the end of the school-garden program. Thus, future studies that further explore the impact of parental vegetable consumption on child vegetable consumption in the context of school gardens would be beneficial.

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CHAPTER I

INTRODUCTION

Childhood obesity is associated with many adverse consequences, such as social stigma, reduced psychological health, and development of chronic diseases.¹⁻³ Moreover, children with obesity are likely to have obesity as adults.^{4,5} A well-balanced diet, which includes FV, is one approach to help reduce the risk of childhood obesity^{6,7} and promote desirable health outcomes in children as well as behaviors that will extend into adulthood.⁸ However, many children do not meet the recommendations for FV consumption.^{9,10} Many children also live in food-insecure households¹¹ and may in turn lack access to healthy foods like FV.¹² Thus, identifying effective strategies that increase children's FV consumption as well as their access to FV is warranted. One solution may be integrating school gardens into the elementary curriculum.

Several quasi-experimental studies indicate that school gardens significantly increase children's FV knowledge and preferences,¹³⁻¹⁶ which may lead to increased FV consumption over time.^{16,17} Furthermore, a single randomized controlled trial has shown significantly greater availability of vegetables in the homes of children who participated in school gardens compared with children who did not participate in school gardens.¹⁸ Greater availability of these foods in the home may then lead to increased food security in children. Also, because some studies have identified positive associations between FV

availability and FV consumption in children,^{19,20} school gardens may have an indirect impact on child FV consumption.

Other studies have found associations between FV availability and FV consumption in adults as well.²¹ Thus, school gardens may also have an indirect impact on parental FV consumption through increased FV availability at home. Subsequently, parental modelling of FV consumption could influence child FV preferences and consumption, as indicated by some studies.³⁸⁻⁴⁰ Therefore, based on the available evidence, the potential role of school gardens in increasing food security and FV preferences and consumption in children needs to be further explored.

The purpose of this study was to provide insight into this potential impact of school gardens on food security in children by examining the impact of a school garden in Houston, Texas on FV availability in the homes of children. This study also adds to the existing literature by identifying associations between school-garden participation and FV preferences and consumption in children. Lastly, this study explored the potential impact of school gardens on parental FV consumption and how this may subsequently influence children's FV preferences and consumption.

Insight gained from this study may influence the direction of future research efforts that focus on analyzing the direct and indirect impact of school gardens on many outcomes, including food security. Findings from this study may also support the use of school gardens as regular components of school curricula, which in turn will benefit school-garden owners and participating students.

CHAPTER II

LITERATURE REVIEW

Childhood obesity rates in the United States continue to rise; the most recent estimates indicated that 19.3% of children (aged 6–11 years) had obesity in 2015–2018 compared with 15.8% of children in 1999–2002.²⁵ Childhood obesity is associated with many adverse consequences, including the development of chronic diseases, social stigma, and reduced psychological health.¹⁻³ Additionally, children with obesity are likely to have obesity and other chronic diseases when they become adults.⁴⁻⁵

A well-balanced diet, which includes FV, is one approach to help reduce the risk of childhood obesity^{6,7} and promote desirable health behaviors and outcomes of children that will extend into adulthood. FV contribute many nutrients to the US diet, including those that are currently of public health concern such as fiber, potassium, magnesium, and Vitamins A, C, and E.⁹ Also, increased FV consumption in children at risk for obesity has been associated with decreased consumption of high-fat, high-sugar foods,^{6,7} which may lead to decreases in excessive calorie intake and subsequent lower risk for childhood obesity. Thus, FV consumption supports optimal health in children and, in turn, may reduce future incidence and mortality rates of chronic diseases.²⁶⁻²⁹ A well-balanced diet may also play an important role in weight maintenance and the prevention of weight gain in adults.²⁸⁻³¹ Therefore, a diet rich in FV would be beneficial if

introduced in early childhood in order to promote good health and establish long-term healthy-eating habits⁶ and consequently, reduced future disease risk.²⁶⁻²⁹

However, many children in the US do not meet federal intake recommendations for FV.^{9,10} Specifically, boys and girls, ages 4 to 13 years, eat on average 0.8–1.1 cup equivalents of vegetables per day, while older boys and girls, ages 9 to 13 years, eat on average 1.1–1.2 cup equivalents of fruit per day.⁹ By contrast, federal recommendations for FV intake are 1–2 and 1.5–3 cup equivalents of fruits and vegetables per day, respectively.⁹

Also, children who live in food-insecure households may lack access to healthy foods. According to the USDA, food insecurity is characterized by “reports of reduced quality, variety, or desirability of diet” and also, depending on the extent of food insecurity, “reports of multiple indications of disrupted eating patterns and reduced food intake.”³² Food insecurity affects 13.6% of American households with children.¹¹ Furthermore, food insecurity has been associated with lower vegetable consumption in children,¹² increased risk of obesity in children,³³ and increased risk of chronic disease in adults.³⁴ Thus, identification of effective strategies to improve children’s FV consumption as well as their access to FV is warranted. Regarding FV consumption, school gardens may be one approach to promote intake of these foods in children.

Systematic reviews show that school gardens have had positive influences on children’s FV knowledge and attitudes.^{16,35} Ohly and colleagues¹⁶ reviewed 18 studies on school gardens that differed in their targeted populations, intervention durations, and

garden complexities. The studies in this review were conducted in elementary, middle, and high schools, and the length of the school-garden interventions ranged from 10 weeks to 18 months. School gardens from studies that reported increases in FV knowledge and attitudes typically contained supplemental components like nutrition education and cooking demonstrations.¹⁶ The review also showed that results were often limited by selection bias and subjective outcome measures. Despite these differences and limitations, Ohly et al.¹⁶ concluded that the findings from these studies indicate that school gardens overall significantly impact FV knowledge and preferences in children.

For example, Morgan and colleagues¹³ conducted a quasi-experimental study to examine the impact of a school-garden program on students' willingness to taste vegetables, their vegetable preferences, and their FV knowledge. To examine this impact, 127 fifth- and sixth-grade students were assigned to one of the following study arms: NE&G, NE, or neither (control group). The two intervention groups (NE&G and NE) received identical nutrition lessons for 10 weeks. Furthermore, the program encouraged parents of children in both intervention groups to help their children complete garden-based homework assignments, such as choosing recipes using vegetables from the school garden to include in a class cookbook. The NE&G group additionally tended to a school garden four times a week for the duration of the intervention.

Following the intervention, students in the NE&G group ($n = 28$) were more willing to taste vegetables than those students in the control group ($n = 48$, $p < 0.001$). Those from the NE&G group also rated the taste of some vegetables more highly than those in the NE ($n = 35$) and control groups. Also, students in the NE&G group were

more likely to report that they would be willing to eat some vegetables as compared with those in the other groups ($p < 0.001$). Lastly, some students in the NE&G group had a greater ability to identify FV than those students from the other groups ($p < 0.001$).

A similar, quasi-experimental study was conducted to examine the impact of a school garden on lower-socioeconomic students' attitudes toward and identification skills of FV.¹⁴ The researchers collected questionnaires and surveys on attitudes toward and knowledge of FV from 120 fourth- to seventh-grade students before and after their participation in a 1-year school-garden intervention. At the end of this intervention, results were analyzed for these students and compared with historical controls (132 fourth- to seventh- grade students from the previous school year who had received no school-garden intervention). The students in the intervention group had significant improvement in their identification of FV compared with controls ($p < 0.005$). Results on attitudes varied across grades, but some patterns emerged. For example, after the intervention, more students in fourth, fifth, and sixth grade thought that vegetables tasted good and desired to eat them daily. Additionally, more students in fifth and sixth grade desired to taste FV.

Similar studies have also shown the beneficial effects of school gardens for children belonging to racial/ethnic minorities. For example, in one quasi-experimental study, authors examined the impact of a 12-week, after-school garden program called “LA Sprouts” on fourth- and fifth-grade Latino students, with and without obesity, who attended a school in Los Angeles.¹⁵ The LA Sprouts participants received weekly nutrition lessons at a local community garden, where culturally-appropriate produce was

utilized (e.g., “cilantro, nopales, beans, corn, and squash”). In addition to the lessons, participants prepared recipes using produce from the garden. After each lesson was completed, the students engaged in garden-related activities for 45 minutes. At the end of the intervention, LA Sprouts participants with obesity ($n = 17$) were found to have significantly higher preferences for vegetables compared with children with obesity in the control group ($n = 42$, $p = 0.009$).

Additionally, systematic reviews report that some studies have found a significant impact of school gardens on FV consumption in children,^{16,35} although many studies have shown that participation in school gardens do not generally result in this outcome.^{13,16,36,37} However, repetitive exposure to FV may lead to increased consumption of these foods in children over time,¹⁷ and one must consider that these school gardens may significantly impact children’s FV knowledge and attitudes, which may be the more immediate changes preceding longer-term behavioral changes such as increased FV consumption.¹⁶ Thus, the available evidence supports the use of school gardens as a means to promote positive changes in children’s FV knowledge and attitudes that can lead to the establishment of long-term healthful behaviors of increased consumption of these foods.

However, the role of school gardens in increasing food security in children needs clarification. Qualitative studies have produced findings from individual interviews, surveys, and focus groups that have suggested a positive effect of gardens on food security.³⁸⁻³⁹ For instance, community and home gardeners from one study reported increased cost savings and vegetable intake as a result of gardening,³⁸ and one case study suggested that school gardens may increase children’s gardening knowledge and skills

that can influence change in community food security.³⁹ However, these results are generally limited by the exploratory nature of these studies. Quantitative studies have also examined whether school-garden programs may increase FV availability at home, which can elucidate the potential of school gardens to increase food security in children.

For example, the TGEG study⁴⁰ tested the effect of a 6-month school-garden intervention, called LGEG, on outcomes such as child vegetable preferences and tasting, child nutrition knowledge, and vegetable availability at home. Children in LGEG also participated in vegetable recipe demonstrations and received booklets that contained healthy-eating activities to be completed at home with their parents. A total of 347 elementary children randomized to the LGEG group had significant increases in their vegetable preferences ($p < 0.001$), vegetable tasting ($p < 0.001$), and nutrition knowledge ($p < 0.001$) compared with children in non-LGEG groups. However, children who participated in the LGEG intervention did not experience any significant changes in vegetable availability in their homes ($p = 0.626$).

On the other hand, results from another randomized controlled trial conducted by Wells and colleagues¹⁸ indicated that children do experience greater vegetable availability at home after they participate in school-garden programs. In this study, 2768 second-, fourth-, and fifth-grade students from low-income schools across 4 different states were randomly assigned to either be a part of a school-garden intervention for 1.5 years or to serve in a control group. At the end of the study, results demonstrated that students in the intervention group had greater vegetable availability at home by 0.64 servings compared with students in the control group ($p = 0.038$). These results suggest

that the duration of school-garden programs may be one factor that affect changes in vegetable availability at home.

Furthermore, the results of this study lend support for school gardens as an approach to increase vegetable availability in homes of children, inviting researchers to add to the findings of this study. Again, although many studies have not shown a significant impact of school gardens on children's FV consumption directly, school gardens may play a role in mediating indirect FV consumption in children through the increased availability of these foods in the home. Notably, evidence suggests that the FV availability at home is associated with increased FV consumption in children.^{19,20} Additionally, since food insecurity is characterized by reduced diet quality and food intake,³² school gardens may improve food security in children by contributing to the availability of these foods in the home.

Another important consideration is that FV availability has also been associated with FV consumption in adults.²¹ One inference from this association is that school gardens may increase FV availability at home, which may then increase FV consumption in parents. Consequently, parental FV consumption may positively impact FV consumption in children as well.

For example, one cross-sectional study by Hanson et al.²² aimed to identify associations between FV availability at home, parents' FV consumption, and FV consumption in female adolescents. The results indicated that FV availability at home was significantly associated with FV consumption in female adolescents ($t_{\text{trend}} = 2.70, p <$

0.01). Specifically, daily FV consumption in female adolescents increased by 1.3 servings in homes that always had FV available compared with homes that never had FV available. FV consumption in parents was also positively correlated with FV consumption in female adolescents (fruit: $t_{\text{trend}} = 3.17, p < 0.01$; vegetables: $t_{\text{trend}} = 3.72, p < 0.01$). Specifically, FV consumption in female adolescents increased by 1.13 and 1.04 daily servings, respectively, when parents ate more than 4 servings of FV per day compared with those parents who ate less than 1 serving of FV per day.

Another study conducted by Wyse and colleagues²³ examined the impact of an intervention designed for parents on the FV consumption of their preschool-aged children. Parents were randomly assigned to either the control group or to the telephone-based intervention program. Trained interviewers called parents in the intervention program weekly for four weeks to educate and counsel them on the application of different strategies that would promote positive behavior change in their children, such as parental modelling of FV consumption and eating meals together as a family.

Additionally, parents in the intervention program also received meal-planning guides, cookbooks filled with healthy recipes, and other resources to help them implement these strategies.²³ FV consumption in all children were scored at baseline and also at 2 and 6 months following the intervention program. Per-protocol analyses demonstrated significantly higher scores in children who belonged to parents in the intervention group at 2 months (17.1 ± 0.3 vs. $15.4 \pm 0.3, p < 0.001$) and 6 months (17.1 ± 0.3 vs. $15.9 \pm 0.3, p = 0.014$), indicating that these children had greater FV consumption than the children of the parents in the control group.

Holley and colleagues²⁴ conducted a similar randomized controlled trial to examine the impact of a home intervention in which parents utilized different strategies to influence their preschool-aged child's consumption of vegetables. Parents and their children were assigned to the control group or to 1 of 4 intervention groups: "(1) repeated exposure; (2) modelling and repeated exposure; (3) rewards and repeated exposure; or (4) modelling, rewards and repeated exposure." In the "repeated exposure" group, parents simply offered their child a particular vegetable, dubbed a "target vegetable," to eat. In the "modelling and repeated exposure" group, the parents themselves ate the target vegetable in front of their child and afterward offered their child the same vegetable to eat. In the "rewards and repeated exposure" group, the parents offered their child the target vegetable, and if the child ate it, the parents praised their child and provided him or her with a sticker. The last group combined all 3 of these strategies to influence child consumption of the vegetable.

All parents were asked to offer their child a target vegetable for 14 consecutive days. Consumption and liking of a target vegetable were measured before and after the study. A total of 115 children, along with their parents, completed this study. At follow-up, the researchers²⁴ did not identify any differences in consumption or liking of a target vegetable between the children in the "modelling and repeated exposure" group and children in the control group. However, children in the "modelling, rewards and repeated exposure" group ate significantly more ($p < 0.05$) of the target vegetable (3.96 g) than did children in the control group (1.14 g). Liking the target vegetable was also highest ($p = 0.05$) in this intervention group and in the "rewards and repeated exposure" group (>60%

of participants) compared with the control group (10%). These findings suggest that the act of rewarding positive behavior is an effective strategy to utilize in order to promote change in children's FV consumption and preferences as well as an effective supplement to other strategies, like parental modelling, to influence change.

Overall, these studies indicate that positive behaviors in parents, such as parental modelling, influence child FV consumption, but these studies also seem to indicate that supplemental strategies to parental modelling may help produce the desired effect. In light of this consideration, identification of the impact of parental behaviors like modelling on child consumption of and even preferences for FV in the context of school gardens would be valuable.

Therefore, based on the available evidence, the potential impact of school gardens on food security and FV preferences and consumption in children needs to be further explored. The purpose of this study was to provide insight into the impact of school gardens on food security in children by examining the impact of a school garden in Houston, Texas, on the availability of FV in the homes of children. This study also adds to the existing literature by identifying any associations between school-garden participation and FV consumption and preferences in children. Finally, this study explored the impact of school gardens on FV consumption of parents and how this

particular parental behavior or characteristic may subsequently influence their children's FV consumption and preferences.

In summary, the objectives of this study are:

1. Identify the impact of school-garden participation on FV availability in the home and household food security for children in Houston, Texas.
2. Explore the impact of school-garden participation on children's FV preferences and consumption.
3. Examine parental characteristics as potential mediators in changing children's FV preferences and consumption.

Research hypotheses of this study are as follows:

H₀: School-garden participation will have no impact on FV availability in the home and household food security for children in Houston, Texas.

H_a: School-garden participation will impact FV availability in the home and household food security for children in Houston, Texas.

H₀: School-garden participation will not impact children's FV preferences and consumption.

H_a: School-garden participation will impact children's FV preferences and consumption.

H₀: Parental characteristics will not be potential mediators in changing children's FV preferences and consumption.

H_a: Parental characteristics will be potential mediators in changing children's FV preferences and consumption.

CHAPTER III

METHODOLOGY

RECRUITMENT AND STUDY DESIGN

The Texas Woman University Institutional Review Board (see Appendix A) and Cypress-Fairbanks Independent School District (see Appendix B) approved this study. Through convenience sampling, third-grade students ($n = 154$) and their parents were recruited from an elementary school with a garden program in Houston, Texas, for the 2019–2020 school year. Students and their parents were recruited through word-of-mouth from third-grade teachers and the school newsletter. All third-grade students participated in the school-garden program, but elementary students from other grades were excluded from this study since they did not participate in the school-garden program. Data were collected only from parents who provided informed consent for themselves and their children to participate in the study (see Appendix C) and from children who provided assent to participate (see Appendix D). This study employed a before-after study design, with additional cross-sectional analyses included as well.

SCHOOL-GARDEN PROGRAM AND CURRICULUM

The school-garden program was an existing program that served as a part of the school's science curriculum. The program was designed and implemented by a garden coach of a local school- and community-gardening business. The garden coach used an established curriculum (see Appendix E) that consisted of monthly lesson plans from September to May. Produce that was planted and harvested at the school's garden is provided in Appendix F.

The curriculum comprised monthly gardening and vocabulary lessons (eg composting, crop planning, identifying plants and parts of a crop, photosynthesis, pollination, propagation, seed spacing and depth, stages of seeds, weeding), lists of produce to plant and harvest, and hands-on gardening activities (eg composting, planting and harvesting produce, produce sampling, weeding). Lesson plans for April and May also included activities that centered on preparing recipes with produce from the garden for teacher appreciation days, creating cookbooks with these recipes, and setting goals for eating more FV.

From September 2019 to approximately mid-March 2020, the gardening lessons and activities occurred in-person twice monthly. However, due to the COVID-19 pandemic during the spring of the 2019–2020 school year, the school-garden program transitioned to online learning. Consequently, nine weekly video lessons and accompanying garden activities to do at home were made available to students on the garden coach's personal website and blog during the months of April and May (see

Appendix G). The garden coach and parent volunteers also maintained the participating school's garden during the pandemic, and despite school closure, the third-grade students and their families were still able to access the garden.

OUTCOMES AND DATA COLLECTION

The primary outcomes of this study are FV availability at home and household food security, while secondary outcome variables are FV preferences and consumption. Parental characteristics that may have influenced children's FV preferences and consumption were also examined. Data before (baseline), during (midpoint), and after (follow-up) the garden program were obtained through validated surveys, described below. Descriptive information about participant sex, race/ethnicity, age, and household size were also collected.

INSTRUMENTS

Child and parent participants completed the National Institutes of Health's NCI "All-Day" screener⁴¹ in order to assess the typical amount and frequency of their FJV intake over the last month (see Appendix H). FV categories in this screener included "100% juice," "fruit," "lettuce salad," "French fries or fried potatoes," "other white potatoes," "cooked dried beans," "other vegetables," "tomato sauce," "vegetable soups," and "mixtures that included other vegetables."

Child and parent responses to this survey were analyzed as estimated daily servings. Results for "total FV intake" included all fruits, juice, and vegetables. Results

for “total fruit” included fruits plus juice, while results for “fruit” included only fruits and not juice. Lastly, results for “total vegetables” included all vegetables.

The child participants also completed a Food Preference Survey⁴² (see Appendix I) that measured FV preferences based on the following scale: “I like this a lot,” “I like this a little,” “I do not like this,” and “I don’t know what this is.” This survey was modified to include produce grown in the school garden. After this modification, the survey listed 37 FV. Of note, no fruit or vegetable juices were included in this survey. Responses of “I like this a lot” were coded as 2; “I like this a little” as 1; “I do not like this” as -1; and “I don’t know what this is” as 0. Mean scores were obtained from summing participants’ coded responses. Possible scores range from -37 to 74. Higher mean scores indicate greater preferences for fruits and/or vegetables compared with lower mean scores.

Parents completed the “Questionnaire on Influences on FJV Availability,” a multi-choice survey adapted from Baranowski and colleagues,⁴³⁻⁴⁷ (see Appendix J) to evaluate FV availability at home. This questionnaire assessed the availability of different fruits, fruit juices, and vegetables in the home over the last week. It included a total of 34 FV categories. Parents marked “yes” if they did have a particular FV item available in their home, and they marked “no” if they did not. Responses of “yes” were coded as 1, and responses of “no” were coded as 0. Mean scores were obtained from summing parent participants’ coded responses. Possible scores range from 0 to 34. Higher mean scores indicate greater availability of fruits and/or vegetables in the home compared with lower

mean scores. Mean scores represent FV availability at home for both parents and their child participants.

Lastly, parents completed the USDA's U.S. Household Food Security Survey,⁴⁸ (see Appendix K) a 6-question survey that assesses food security over the last month. The first two questions were posed as the following statements: "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more" and "(I/we) couldn't afford to eat balanced meals." Responses to these two statements were marked as either "often true," "sometimes true," "never true," or "don't know or refused." The remaining questions asked parents whether they ever had to skip meals, eat less than they felt they should, or felt hungry due to a lack of money for food. Responses to these questions were "yes," "no," or "don't know."

Responses of "often true," "sometimes true," and "yes," were coded as affirmative, and the remaining responses were coded as negative. An affirmative response was scored as 1, and a negative response was scored as 0. Coded responses were then summed; scores of 0–1 denoted "high or marginal food security"; 2–4, "low food security"; and 5–6, "very low food security." Families with scores of 0–1 were reported as "food secure." Due to the current study's small sample size, families with scores of 2–4 and 5–6 were combined and reported as "food insecure."

Child participants and their parents completed all these surveys at home before and after the children's participation in the school-garden program. Baseline surveys were sent home with child participants, but follow-up surveys were emailed to parent

participants because of school closure due to the COVID-19 pandemic. Parents were informed that they could assist their child participants as needed in the completion of their baseline and follow-up surveys. Lastly, child participants completed the Food Preference Survey at school during the midpoint of the school-garden program. For this study, child and parent participants who completed only baseline surveys are labeled “baseline participants,” and the child and parent participants who completed baseline, midpoint, and follow-up surveys are labeled “completers.”

STATISTICAL ANALYSES

Descriptive statistics for categorical variables were calculated and are presented as frequencies and percentages. Descriptive statistics for continuous variables are presented as means and standard deviation. Two-tailed paired t-tests compared mean changes from baseline to follow-up in the outcome measures. A repeated-measures ANOVA assessed changes in the outcome measures of interest before and after the school-garden program. Associations between garden participation and the outcomes of interest (intake, preferences, food security, and availability) were examined. Spearman’s Rank correlation was used to explore the relationship between parental characteristics (namely, parental FV consumption) and children’s FV preferences and consumption. Linear regression was also used to explore children’s FV intake as a function of time and fruit, juice, and vegetable availability at home. Statistical significance was considered as a P-value < 0.05 for overall tests and adjusted for any *post hoc* comparisons.

CHAPTER IV

RESULTS

CHILD AND PARENT CHARACTERISTICS

Sixty-four students provided consent to participate in this study. A total of 39 students (58% female), each with 1 parent (97% female), completed baseline surveys. Additionally, 32 students completed midpoint surveys. Lastly, 9 students (56% male), each with one parent (all females), completed final surveys (see **Figure 1**). These students and parents who completed all study surveys from baseline to follow-up are labelled “completers.”

Figure 1. Flow Diagram of Participant Recruitment and Dropout

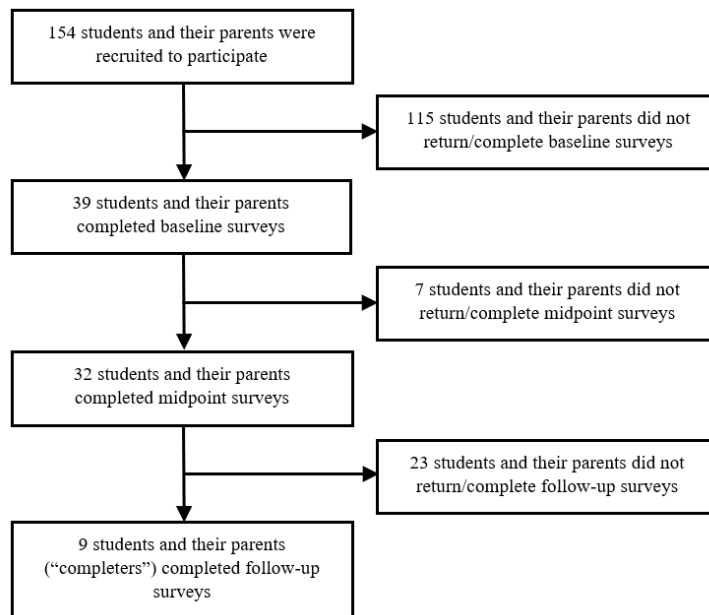


Table 1 summarizes the characteristics of the children (ie students) and parents who completed baseline surveys as well as the characteristics of completers. Child participants at baseline self-identified as either Hispanic or Latino (36.8%), White (36.8%), Black or African American (15.8%), Asian (5.3%), or “Other” (5.3%). Parent participants at baseline identified as either Hispanic or Latino (42.1%), White (39.5%), Black or African American (13.2%), or Asian (5.3%). At follow-up, 33.3% of child completers were Black or African American, 33.3% White, 22.2% Hispanic or Latino, or 11.1% “Other”; 55.6% of parent completers were White, 33.3% Hispanic or Latino, and 11.1% Black or African American.

Mean parent age at baseline was 37.7 ± 5.1 years, while the mean parent age at follow-up was 38.6 ± 5.9 years (not shown in Table 1). Approximately 87% of children at baseline were 8 years old, and approximately 67% of child completers were 8 years old at follow-up. Finally, the percentage of parents who reported to be food insecure remained similar for the duration of the study, with 21% at baseline and 22% at follow-up.

Table 1. Characteristics of Baseline Participants and Completers^{a,b}

	Baseline participants		Completers	
	<i>Children</i> <i>n = 39</i>	<i>Parents</i> <i>n=39</i>	<i>Children</i> <i>n = 9</i>	<i>Parents</i> <i>n = 9</i>
Gender				
Male	16 (42.1)	1 (2.6)	5 (55.6)	NA
Female	22 (57.9)	37 (97.4)	4 (44.4)	9 (100)
Race/ethnicity				
Asian	2 (5.3)	2 (5.3)	NA	NA
Black	6 (15.8)	5 (13.2)	3 (33.3)	1 (11.1)
Hispanic or Latino	14 (36.8)	16 (42.1)	2 (22.2)	3 (33.3)
White	14 (36.8)	15 (39.5)	3 (33.3)	5 (55.6)
Other	2 (5.3)	NA	1 (11.1)	NA
Age, y^c				
8	32 (86.5)		6 (66.7)	
9	5 (13.5)		3 (33.3)	
Household size, No.^d				
3		4 (10.5)		NA
4		24 (63.2)		4 (44.4)
5		6 (15.8)		2 (22.2)
6		3 (7.9)		2 (22.2)
7		1 (2.6)		1 (11.1)
Food security^e				
Food Insecure		8 (20.5)		2 (22.2)
Food Secure		31 (79.5)		7 (77.8)

^aValues are presented as numbers (percentages).^bNA represents data that are not available.^cAge is presented in years and for children only.^dHousehold size represents the parent participant, his or her spouse (if any), and the remaining number of individuals who live with him or her, including his or her child participant(s).^eFood security denotes the level of food security for the entire household.

FV HOME AVAILABILITY AND FOOD SECURITY OVER TIME

Table 2 presents mean scores for home FV availability for all child and parent participants before and after the garden program. At baseline (n = 39), the mean score for total FV availability at home was 16.7 ± 5.2 ; vegetables, 8.3 ± 2.9 ; and total fruit, 8.8 ± 2.9 . At follow-up (n = 9), the mean score for total FV availability at home in completers (n = 9) was 17.4 ± 5.9 ; vegetables, 9.6 ± 3.2 , and total fruit, 7.9 ± 3.1 . Additionally, no changes in fruit, juice, and vegetable availability (-0.89 ± 7.8 servings, $p = 0.7428$) or food security (0.33 ± 0.87 , $p = 0.28$) were found for completers from baseline to follow-up.

Table 2. Home FV Availability at Baseline and Follow-Up in All Participants^a

Variable	<i>Baseline</i> (<i>n</i> = 39)	<i>Follow-up</i> (<i>n</i> = 9)
	M ± SD	M ± SD
Total FV	16.7 ± 5.2	17.4 ± 5.9
Vegetables	8.3 ± 2.9	9.6 ± 3.2
Total Fruit	8.8 ± 2.9	7.9 ± 3.1
Fruit	7.3 ± 2.6	6.9 ± 2.6
Juice	1.5 ± 0.82	1.0 ± 0.87

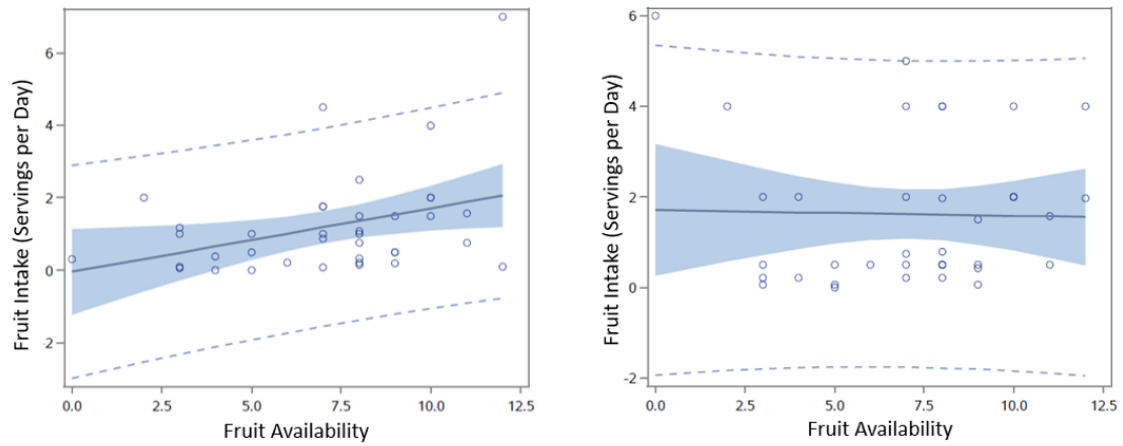
^aData are presented as mean scores ± SD. Each variable represents the home availability of that particular FV item for both child and parent participants.

FV HOME AVAILABILITY ON FV INTAKE

Figure 2 indicates that fruit availability at home was positively correlated with total fruit intake of parents ($\beta = 0.18$; $p = .0261$; $R^2 = 0.13$) but not for children ($p = .8931$) at baseline ($n = 39$). No significant associations were found between vegetable availability and vegetable intake in children or parents (data not shown).

Baseline results for completers ($n = 9$) indicated no significant associations between FV availability at home and FV intake in parents or children (data not shown). At follow-up, no significant associations were found between FV availability at home and FV intake in children (see **Figure 3**). However, vegetable availability at home was positively correlated with vegetable intake in parents ($\beta = 0.15$; $p = 0.0028$; $R^2 = 0.80$) at follow-up (see **Figure 3**). No other significant associations were found for parents.

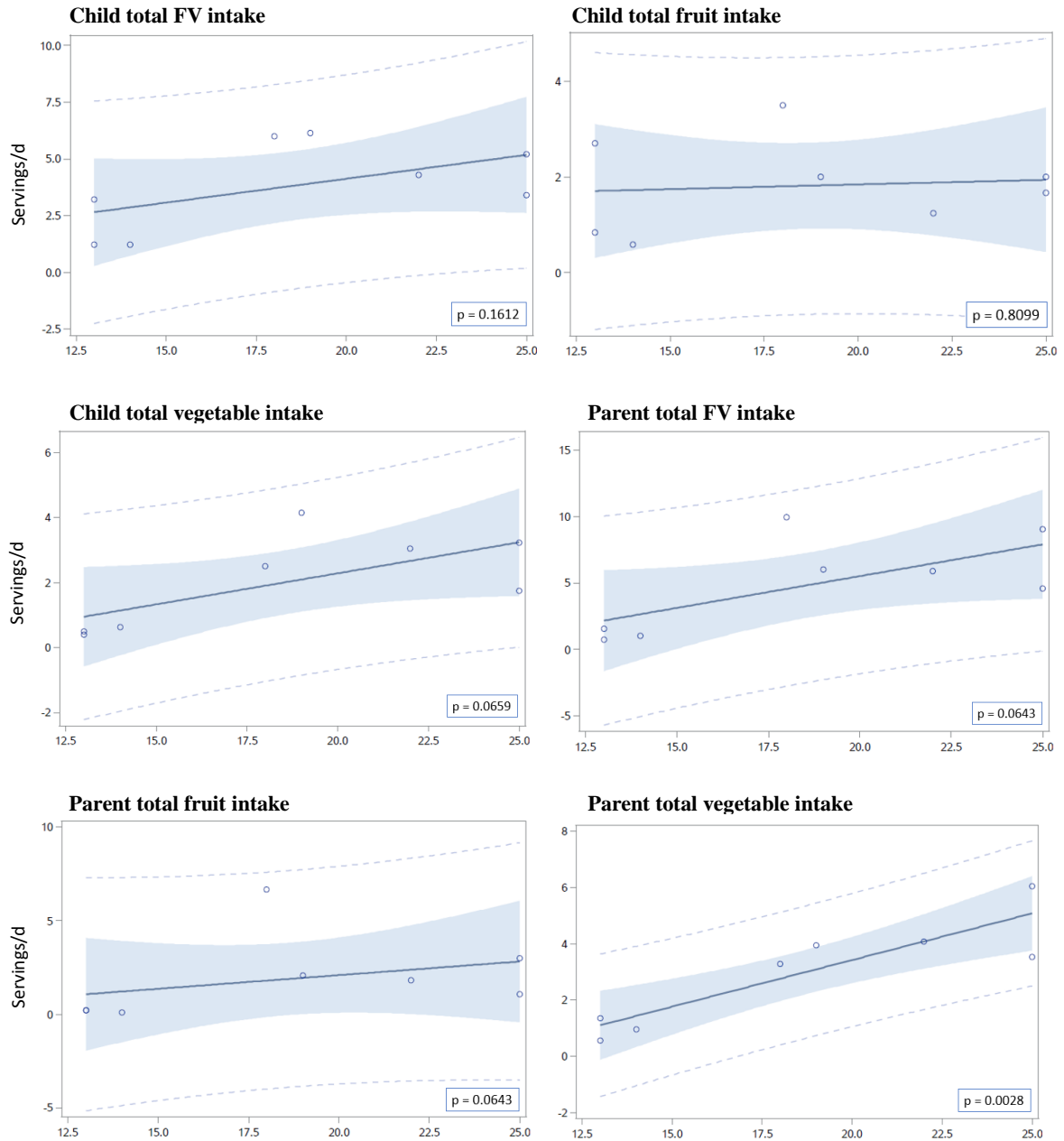
Figure 2. Correlations between Baseline Parent (Left) and Child (Right) Fruit Intake and Fruit Availability Scores at Home (n = 39)^{a,b}



^aScores reflect the number of fruits available in the home per week.

^bConfidence intervals of 95% are represented by the shaded areas.

Figure 3. Correlations between Final FV Intake (y-axis) of Child and Parent Completers (n = 9) in Daily Servings and FV Availability Scores (x-axis) at Home^{a,b}



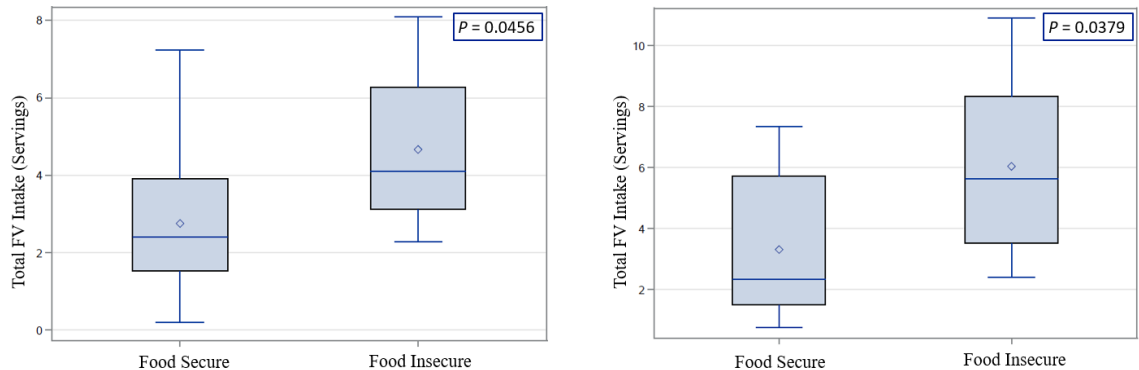
^aScores reflect the number of fruits and vegetables available in the home per week.

^bConfidence intervals of 95% are represented by the shaded areas.

FOOD SECURITY ON FV INTAKE

As shown in **Figure 4**, parents who were food insecure ($n = 8$) had significantly greater total FV intake (4.7 servings/day) along with their children (6.0 servings/day) compared with parents (2.8 servings/day) and children (3.3 servings/day) who were food secure ($n = 31$). No other significant differences occurred in intake between participants with low food security and participants with high food security (data not shown).

Figure 4. Total FV Intake by Level of Food Security in Parents (Left) and Children (Right) at Baseline ($n = 39$)



FV PREFERENCES OVER TIME

At baseline, the mean score for total FV preferences in child completers was 28.8 ± 11.9 ; total fruit preferences, 12.2 ± 4.6 ; and vegetable preferences, 16.6 ± 9.1 (see **Table 3**). At midpoint, the mean score for total FV preferences was 27.7 ± 12.5 ; total fruit preferences, 11.9 ± 4.5 ; and vegetable preferences, 15.8 ± 9.8 . At follow-up, the mean score for total FV preferences was 27.6 ± 13.8 ; total fruit preferences, 11.0 ± 6.0 ; and vegetable preferences, 16.6 ± 9.1 . **Figure 5** indicates that child completers'

preferences did not significantly change from baseline to follow-up for total FV ($p = 0.1827$), total fruit ($p = 0.7831$), or vegetables ($p = 0.1226$).

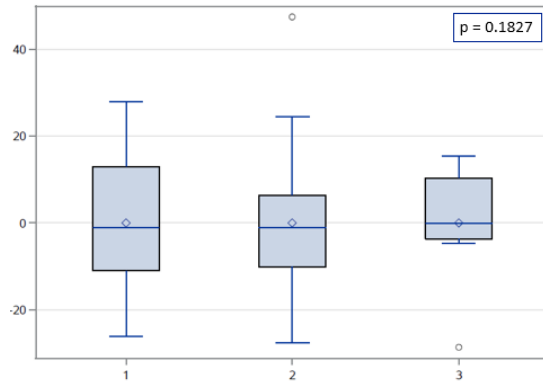
Table 3. FV Preferences in Child Completers ($n = 9$) at Baseline, Midpoint, and Follow-up^a

Variable	<i>Baseline</i>	<i>Midpoint</i>	<i>Follow-up</i>
	M ± SD	M ± SD	M ± SD
Total FV	28.8 ± 11.9	27.7 ± 12.5	27.6 ± 13.8
Fruit	12.2 ± 4.6	11.9 ± 4.5	11.0 ± 6.0
Vegetables	16.6 ± 9.1	15.8 ± 9.8	16.6 ± 9.1

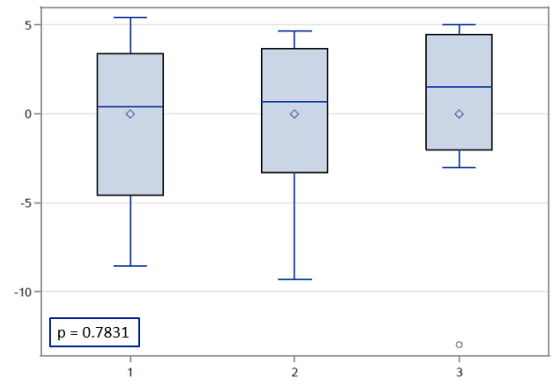
^aData are presented as Mean ± SD. Means represent mean scores of child participants' preferences for total FV, total fruit, and vegetables.

Figure 5. Box Plots Indicate Scores of Total FV Preferences (Graph A), Fruit Preferences (Graph B), and Vegetable Preferences (Graph C) in Child Completers over Time^a

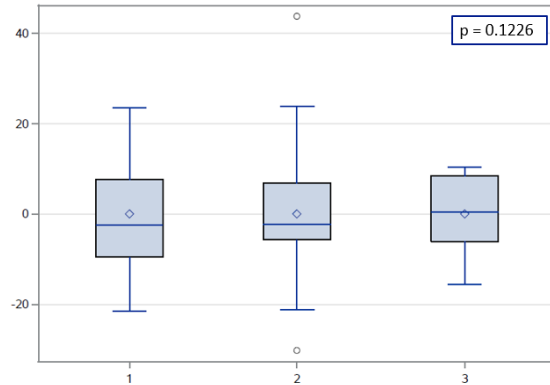
A) Total FV Preferences



B) Fruit Preferences



C) Vegetable Preferences



^aPoints 1, 2, and 3 along the x-axis represent baseline, midpoint, and follow-up, respectively.

FV INTAKE OVER TIME

Results for all baseline participants indicated that parents consumed on average 3.1 servings of total FV daily, while children consumed on average 3.9 servings of total FV daily (see **Table 4**). As shown in **Table 5**, baseline results indicated that parent completers consumed 4.9 servings of total FV daily, while child completers consumed 3.3 servings of total FV daily. At follow-up, parent completers had a mean daily intake of 4.7 servings of total FV, and child completers had a mean daily intake of 3.8 servings of total FV. No significant changes occurred in child completers' total FV intake ($p = 0.9794$), total fruit intake ($p = 0.7831$), or total vegetable intake ($p = 0.3721$) from baseline to follow-up. Likewise, no significant changes occurred in parent completers' total FV intake ($p = 0.9210$), total fruit intake ($p = 0.3153$), or total vegetable intake ($p = 0.3585$) from baseline to follow-up.

Table 4. FV Intake in All Baseline Participants^a

<i>Variable</i>	<i>Parents</i>		<i>Children</i>	
	<i>n</i>	<i>M ± SD</i>	<i>n</i>	<i>M ± SD</i>
Total FV	39	3.1 ± 1.9	39	3.9 ± 2.5
Total Fruit	38	1.8 ± 1.7	38	2.3 ± 2.1
Total Vegetables	39	1.4 ± 1.2	39	1.6 ± 1.1
Juice	38	0.56 ± 1.0	38	0.69 ± 1.1
Fruit	38	1.2 ± 1.4	38	1.6 ± 1.6
Lettuce Salad	33	0.31 ± 0.32	37	0.14 ± 0.21
Fried Potatoes	34	0.20 ± 0.20	37	0.31 ± 0.27
Other White Potatoes	33	0.25 ± 0.22	38	0.13 ± 0.17
Beans	27	0.32 ± 0.37	38	0.22 ± 0.30
Other Vegetables	37	0.38 ± 0.30	38	0.70 ± 0.87
Tomato Sauce	23	0.069 ± 0.056	37	0.12 ± 0.16
Vegetable Soup	33	0.19 ± 0.23	38	0.051 ± 0.12

^aMeans represent mean daily intake in servings.

Table 5. FV Intake in Parent and Child Completers from Baseline to Follow-Up^a

<i>Variable</i>	<i>Parents (n = 9)</i>		<i>Children (n = 9)</i>	
	<i>Baseline</i>	<i>Follow-up</i>	<i>Baseline</i>	<i>Follow-up</i>
	<i>M ± SD</i>	<i>M ± SD</i>	<i>M ± SD</i>	<i>M ± SD</i>
Total FV	4.9 ± 2.3	4.7 ± 3.3	3.3 ± 1.8	3.8 ± 1.9
Total Fruit	1.2 ± 0.82	1.8 ± 2.1	1.6 ± 1.5	1.8 ± 0.96
Total Vegetables	3.6 ± 1.9	2.9 ± 1.8	1.6 ± 0.7	2.0 ± 1.4
Juice	0.23 ± 0.34	0.32 ± 0.44	0.44 ± 0.42	0.72 ± 0.94
Fruit	0.99 ± 0.79	1.5 ± 2.0	1.2 ± 1.3	1.1 ± 0.80
Lettuce Salad	0.90 ± 0.37	0.48 ± 0.51	0.13 ± 0.14	0.11 ± 0.18
Fried Potatoes	0.29 ± 0.33	0.25 ± 0.17	0.25 ± 0.16	0.17 ± 0.086
Other White Potatoes	0.26 ± 0.37	0.26 ± 0.34	0.14 ± 0.15	0.23 ± 0.33
Beans	0.21 ± 0.24	0.46 ± 0.48	0.20 ± 0.20	0.17 ± 0.26
Other Vegetables	1.7 ± 1.2	1.2 ± 1.15	0.76 ± 0.56	1.0 ± 1.0
Tomato Sauce	0.21 ± 0.14	0.14 ± 0.13	0.14 ± 0.13	0.13 ± 0.11
Vegetable Soup	0.054 ± 0.068	0.091 ± 0.22	0.036 ± 0.044	0.20 ± 0.47

^aMeans represent mean daily intake in servings.

PARENTAL INTAKE ON CHILD FV PREFERENCES AND INTAKE

Total FV consumption in parent completers was significantly correlated with FV consumption in child completers at follow-up ($r = 0.86, p = 0.007$), but not at baseline ($r = 0.67, p = 0.05$). Moreover, total FV consumption in parent completers was significantly correlated with vegetable consumption in child completers at baseline ($r = 0.93, p = 0.004$) and at follow-up ($r = 0.76, p = 0.03$), but not with child completers' fruit consumption at baseline ($p = 0.17$) or at follow-up ($p = 0.24$). Parent completers' total fruit consumption was correlated with child completers' total fruit consumption at baseline ($r = 0.85, p = 0.004$) but not at follow-up ($p = 0.11$). Conversely, parent completers' vegetable consumption was not correlated with child completers' vegetable

consumption at baseline ($p = 0.73$), but it was correlated with child completers' vegetable consumption at follow-up ($r = 0.83$, $p = 0.01$).

At baseline, total FV consumption in parent completers was not correlated with child completers' preferences for fruit ($p = 0.65$), vegetables ($p = 0.53$), or total FV ($p = 0.80$). At follow-up, total FV consumption in parent completers was also not correlated with child completers' preferences for fruit ($p = 0.98$), vegetables ($p = 0.65$), or total FV ($p = 0.91$).

CHAPTER V

IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSIONS

The current study primarily aimed to explore the impact of a school garden on FV availability at home and household food security for elementary children in Houston, Texas. Another aim of this study was to examine the impact of this school garden on the children's FV preferences and consumption. Lastly, this study also aimed to examine the effect of the parents' FV consumption on their children's FV preferences and consumption in this context of a school garden.

Results of this study were likely affected by the cancellation of in-person classes as a result of the COVID-19 pandemic during the end of the school year. Additionally, the COVID-19 pandemic disrupted the consistent execution of the in-person school-garden program, which also may have impacted the results of this study. Nonetheless, the internal validity of this study was increased by the continuation of the school-garden program via online learning during the months of school closure. This online instruction included weekly video lessons and gardening activities for the participants to do at home (see Appendix G). Also, these students and their families were still able to access the garden during this time despite school closure.

In the US, 13.6% of households with children are food insecure.¹¹ In this study sample, approximately 21% of parents at baseline ($n = 8$) and 22% of parent completers

(n = 2) reported being food insecure. Baseline results for all participants (n = 39) indicated that children and parents who were food insecure had greater FV consumption compared with children and parents who were food secure. This finding was likely due to differences in fruit and fruit juice intake rather than vegetable intake.

Results of this study also showed that no significant changes occurred in the home availability of FV and subsequent household food security in child completers from baseline to follow-up, indicating that the school garden had no impact on these outcomes. These results are unlike the findings of some studies that have suggested a positive effect of gardens on FV availability and food security.^{18,38,39} Notably, some of these studies were qualitative in design and centered on gardens in the community setting, although other studies on community gardens have reported no correlation between these gardens and food security as well.⁴⁹⁻⁵¹

The trial conducted by Wells et al.¹⁸ focused on school gardens in low-income schools, and the findings of this trial suggested that school gardens can increase vegetable availability in the homes of children. This finding implies that school gardens can then potentially increase household food security. On the contrary, results from the TGEG study⁴⁰ indicated that school gardens in low-income schools do not increase vegetable availability at home, but the 6-month duration of the LGEG intervention may have affected this outcome. Also, the researchers of this study noted that lack of parental involvement in the LGEG home activities may explain why no increases in vegetable availability at home were found.

The inconsistencies in these studies on gardens and food security merit further research in this area. The school-garden program in the current study lasted for 1 year, and almost 80% of participants reported being food secure. The extent of parental involvement in this study's school-garden program was not analyzed, but parental involvement is recognized to be a component that could also have affected the outcomes of this study. Thus, the duration of a school garden program, the socioeconomic status of the target population, and parental involvement are all factors that may affect vegetable availability at home and should be explored in future studies.

Although this study's results did not indicate any changes in FV availability at home or food security, they did indicate that vegetable availability at home was significantly associated with vegetable intake in parent completers at follow-up. This is comparable to other studies that have identified associations between FV availability and consumption of these foods in adults.²¹

However, no significant associations were found between FV availability at home and FV consumption in child completers. This finding is inconsistent with prior evidence.^{19,20} Some studies have identified positive associations between FV availability at restaurants or schools and FV consumption in children,^{52,53} and other studies have reported positive associations between FV availability at home and FV consumption in children.^{52,54} Perhaps if FV availability at home did increase in the current study, subsequent changes in FV consumption in child completers may have been observed.

Interestingly, no significant changes in child completers' preferences for fruits or vegetables from baseline to follow-up were identified. This incongruous finding may have been partly influenced by the interruption of the in-person school-garden program caused by the COVID-19 pandemic, but it is important to note that previous research has shown that children who participated in garden programs with durations of 10 to 12 weeks had significant increases in their FV attitudes and preferences.^{13,15}

Moreover, other studies have reported increases in FV attitudes and preferences in children who participated in garden programs that had regular cooking or recipe demonstrations.^{15,16,40} Preparing recipes was a planned activity for the school-garden program in this study for the months of April and May, but the activity did not occur due to school closure during this time. This may have affected the results of this study since this activity was not a regular component of the school-garden program. These dissimilar findings may also have been likely influenced by the small sample size of this study.

Also, FV preferences have been shown to predict FV consumption in children.⁵⁵ Thus, it is reasonable that no significant change in child completers' FV consumption from baseline to follow-up was observed. Additionally, prior research has demonstrated that school gardens do not consistently result in increased FV consumption in children.^{13,16,35-37}

Notably, the results of this study indicate that child completers consumed on average 1.6 and 1.8 servings of fruit per day and 1.6 and 2.0 servings of vegetables per day at baseline and follow-up, respectively. This finding shows that child completers met

federal intake recommendations for fruit (1–2 cup equivalents per day) and vegetables (at least 1.5–3 cup equivalents per day).⁹ These participants' high FV intakes may partly explain why no changes in their FV intake occurred from baseline to follow-up.

This finding also indicates that child completers had on average greater FV intake than the national average intake of 0.8–1.1 cups of vegetables per day and 1.1–1.2 cups of fruit per day,⁹ which may be due to differences in intake measures. The national data from NHANES are collected from two 24-hour dietary recalls, where participants use food models and other visuals to estimate the amounts they eat.⁵⁶ On the other hand, data on FV intake in participants in this study were collected via a food frequency questionnaire based on FV consumption over the last month,⁴¹ and food models and other visuals were not utilized.

Lastly, results of this study did not indicate any changes in parent completers' FV consumption from baseline to follow-up. Also, FV consumption in parent completers was not correlated with child completers' FV preferences at follow-up in this study. Furthermore, this study did not find any correlation between parent completers' total fruit consumption and child completers' total fruit consumption at follow-up. Although no impact of the school garden on vegetable availability at home or on child and parental vegetable consumption was found, parent completers' vegetable consumption was found to be positively correlated with child completers' vegetable consumption at follow-up but not at baseline. This finding may be due to a greater frequency of meals consumed at home that was likely due to quarantine restrictions as a result of COVID-19 precautions.

Moreover, previous research has reported that the utilization of multiple strategies such as parental modelling, rewards, and repeated exposure to vegetables, can increase children's consumption and liking of vegetables.²⁴ Thus, the correlation found between parental vegetable consumption and child vegetable consumption at follow-up in the present study may have been influenced by the children's repeated exposure to vegetables during the course of the school-garden program. Therefore, future studies can explore the effectiveness of school gardens as supplemental strategies to parental modelling in increasing vegetable consumption in children.

Another consideration is that since vegetable availability at home was associated with vegetable consumption in parents at follow-up, the availability of vegetables in the home may have indirectly influenced child consumption of vegetables through parental modelling of vegetable consumption. However, more research is needed to confirm this speculation as well. Thus, future studies can also examine the direct and also indirect impact of vegetable availability at home on the vegetable consumption in children.

This study was not without its limitations. For example, the study was limited by a before-after study design, and thus no evidence of causation can be determined from the study's findings. The surveys that were administered were also limited by self-report and subjected to social desirability bias. The greatest limitation of the study was the high attrition rate of study participants. At baseline, 39 students and their parents completed study surveys, but at follow-up, only 9 students and their parents, known as "completers," completed study surveys. This attrition rate was most likely influenced by the cancellation of in-person classes due to COVID-19. Lastly, the results of this study may

also not be generalizable to other elementary age groups or children belonging to families of different socioeconomic status.

Despite these limitations, this study was strengthened by the continuation of the school-garden program and by the validated measurements of outcomes. Also, minimal research has been done to examine the impact of school gardens on household food security, and thus this study was rather novel in that it aimed to quantify the effect of a school garden on food security in elementary children and their families. Furthermore, this study provides evidence for the positive impact of parental vegetable consumption on child vegetable consumption in the context of a school garden. Therefore, more studies with larger sample sizes should be conducted to further the understanding of school gardens as an approach to increase food security and also as a supplement to behavior-change strategies like parental modelling to effect change in vegetable consumption in children.

In conclusion, the results of this study indicated that the school garden had no direct impact on FV availability at home, food security, or FV preferences and consumption in this sample of elementary children. Findings from this study did show, however, that vegetable availability at home was significantly associated with vegetable consumption in parents at follow-up. Parental vegetable consumption was positively correlated with child vegetable consumption at follow-up as well. In light of these findings, school gardens may be effective supplements to strategies like parental modelling that can influence positive change in vegetable consumption in children.

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APPENDIX A

Institutional Review Board, Texas Woman's University Approval

7/27/2020

Texas Woman's University Mail - IRB-FY2019-294 - Initial: Expedited Approval Letter



Derek Miketinas <dmiketinas@twu.edu>

IRB-FY2019-294 - Initial: Expedited Approval Letter

irb@twu.edu <irb@twu.edu>

Wed, Sep 11, 2019 at 7:32 AM

To: dmiketinas@twu.edu, msossamon@twu.edu



Texas Woman's University
Institutional Review Board (IRB)

irb@twu.edu

<https://www.twu.edu/institutional-review-board-irb/>

September 11, 2019

Michaela Sossamon
Nutrition and Food Sciences, Nutrition - Houston

Re: Initial - IRB-FY2019-294 The Impact of a School Garden on Fruit and Vegetable Availability at Home for Elementary Children

Dear Michaela Sossamon,

The above referenced study has been reviewed and approved using expedited review procedures on September 10, 2019 by the TWU IRB - Houston operating under FWA00000178. If you are using a signed informed consent form, the approved form has been stamped by the IRB and uploaded to the Attachments tab under the Study Details section. This stamped version of the consent must be used when enrolling subjects in your study.

Note that any modifications to this study must be submitted for IRB review prior to their implementation, including the submission of any agency approval letters, changes in research personnel, and any changes in study procedures or instruments. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All modification requests, incident reports, and requests to close the file must be submitted through Cayuse.

Approval for this study will expire on September 9, 2020. A reminder of the study expiration will be sent 45 days prior to the expiration. If the study is ongoing, you will be required to submit a renewal request. When the study is complete, a close request may be submitted to close the study file.

If you have any questions or need additional information, please contact the IRB analyst indicated on your application in Cayuse or refer to the IRB website at <http://www.twu.edu/institutional-review-board-irb/>.

Sincerely,

TWU IRB - Houston

APPENDIX B

Cypress-Fairbanks Independent School District Approval to Conduct Research



Cypress-Fairbanks Independent School District

Department of District Improvement and Accountability

Ashley Clayburn, Ed.D.

Assistant Superintendent District Improvement and Accountability

To: Michaela Sossamon

From: Ashley Clayburn, Ed.D.

Cc: Ann Melancon, Stefanie Berger

Date: August 14, 2019

Re: Approval of Application to Conduct Research in Cypress-Fairbanks ISD

Your request to conduct the research project titled: *The Impact of a School Garden on Fruit and Vegetable Availability at Home for Elementary Children*, has been approved for Cypress-Fairbanks ISD.

As you pursue this project, please refer to the conditions listed below:

General Conditions:

- ⊙ Keep Ann Melancon, Principal of Copeland Elementary, informed of all activities involved with the project.
- ⊙ You are approved to conduct your research only on the following campus(es): Copeland Elementary
- ⊙ As your research sponsor, Stefanie Berger will assist you in the following manner:
 - Sending consent forms to parents of applicable students only at the campuses named above. The forms will only be sent once. If parents do not respond, they will not be contacted a second time.
 - Consent forms should be returned to Stefanie Berger. She will provide you with the consent forms of those individuals who consent to participate in your study. At that point, you may contact the participants to begin your study. ○ You may not contact any teachers, students, or parents until consent to participate has been received by Stefanie Berger.

- © Surveys may be sent *only* once to participants. If students or parents do not respond, you may not contact them a second time.

Data Related Conditions:

- © No additional data may be collected beyond the student and parent surveys.
- © You have not been approved for any audio or video taping.
- © Practice confidentiality while conducting the various steps necessary to complete the project.
- © Use a pseudonym instead of actual names of campuses or personnel in your research report.
- © Use a random code system to record data collected. Never use actual names, ID, or social security numbers.

**10300 Jones Road, Houston, Texas 77065
Houston, Texas 77269-2003**

P.O. Box 692003 281.897.4000

APPENDIX C

Consent to Participate in Research

TEXAS WOMAN'S UNIVERSITY (TWU)
CONSENT TO PARTICIPATE IN RESEARCH

Title: The Impact of a School Garden on Fruit and Vegetable Availability at Home for Elementary Children

Principal Investigator: Michaela Sossamon, BS.....msossamon@twu.edu 337-304-5265
Faculty Advisor: Derek Miketinas, PhD.....dmiketinas@twu.edu 228-239-4713

About the Study

You and your child are being asked to be in a study by Ms. Michaela Sossamon, a student at Texas Woman's University, as a part of her research project. The purpose of this research is to see how helpful school gardens are for children and parents. We also want to know if children eat more fruits and veggies because of gardening. We also want to know about your foods at home. Your child has been invited to be in this study because they will already be in a garden program at school.

Your child as a participant will be asked to fill out two surveys before and after their time in the garden program to see how much they like fruits and veggies and how often they eat them. These surveys will take your child about 30 minutes to fill out. Your child will also fill out one of these surveys halfway into the garden program, and this survey will take your child about 10 minutes to do.

As a parent/guardian of a child participant, you will also be asked to fill out 2 surveys about food security, fruit and veggies in the home, and how often you eat fruits and veggies. These surveys will also take about 30 minutes to complete. The total time you and your child will spend for this study will be about 2 hours.

Being in this study is completely up to you and your child. Also, you and your child don't have to take the surveys, and you could stop at any time. If you want to know more about this study, please look at the rest of this form carefully and take your time deciding if you want you and your child to be in the study. Please feel free to ask the researcher any questions you may have about the study at any time.

What could happen

The questions on the surveys could make you or your child get tired or frustrated. If that happens, you and your child may stop the surveys at any time. To make sure that your and your child's responses are private, the surveys will be handed out and collected by research team members only. Privacy will be protected to the extent that is allowed by law.

All surveys will be stored in a locked cabinet in the researcher's office at TWU. These surveys will be destroyed three years after the study is finished. This signed form and your child's signed assent form will also be stored in a locked cabinet that is separate from all collected information. These forms will also be destroyed three years after the study is done.

The results of the study may be reported in scientific journals or at professional meetings. Your and your child's completed surveys may also be used for future research or be given to another researcher for future research without additional informed consent. However, your and your child's names will not be included in either of these cases.

If you would like to participate in the current study but not allow your de-identified data to be used for future research, please initial here _____.

The researchers will try to prevent any problem that could happen because of this study. You should let the researchers know at once if there is a problem, and they will try to help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Participation and Benefits

Again, being in this study is up to you and your child. You and your child could stop at any time you want. If you and your child do choose to be in this study, you will help researchers learn about how helpful school gardens can be for children.

Findings from the study may then be able to support the use of school gardens as regular activities in schools, which can benefit school-garden owners and participating students. If you would like to know what happens in this study, the researchers can email or mail the results to you.

Questions about the Study

You will be given a copy of this signed and dated form to keep. If you have any questions about the study, ask the researchers. Their contact information is at the top of this form. If you have questions about your rights as a participant in this study or the way this study has been done, call the TWU Office of Research and Sponsored Programs at 713-794-2480 or e-mail them at irb-houston@twu.edu.

Your child's name

Signature of Parent/Guardian of Child Participant

Date

*If you would like to know the results of this study, tell the researchers where you want them to be sent:

Email: _____ or Address: _____

APPENDIX D
Assent to Participate in Research

TEXAS WOMAN'S UNIVERSITY (TWU)
ASSENT TO PARTICIPATE IN RESEARCH

Title of Study

The Impact of a School Garden on Fruit and Vegetable Availability at Home for Elementary Children

About the Study

We want to know how much you like gardening at school! We want to ask you about how much you like fruits and veggies and how many you eat. We could really use your help!

What you will need to do

If you want to help, you will fill out 2 papers about the fruits and veggies you eat and how much you like them. This is not a test! There are no right or wrong answers. We just want to know what you think! You can ask for help, too.

Being in the study

You may get tired if you have a hard time with the questions. If you do get tired, you can stop at any time. We will also not tell anyone what you put on the papers. If you want to be in this study, you will help us a lot! If you sign this paper, it will mean that you have read this and want to be in this study. If you don't want to be in the study, don't sign this paper.

Sign name here

Date

APPENDIX E
School-Garden Curriculum

September

- Welcome to a new year of gardening!

Activities & Companion Skills	Lessons & Appendices	Vocabulary	Planting & Harvesting
1. Introduction to garden Begin the year with an introduction to the garden. See August/September Appendix for more about the following activities you may do in introduction lessons: <ul style="list-style-type: none"> Tool safety What to wear on garden days What's growing What will be grown Special projects for the year Garden journals Garden tour 	<ul style="list-style-type: none"> Garden Introduction using The Curious Garden Colors, Shapes & ABC's (WF p 35-40) (Grades PK-2) 	Grades 3-5 <ul style="list-style-type: none"> Migration Monarch Nectar plant Host plant Harvest Habitat depth cycle chrysalis germination larva pupa pollinator Clay Loam 	Harvesting: <ul style="list-style-type: none"> Sweet potatoes Okra
2. Prepping beds a. Learning why & how to replenish soil <i>*OTG Garden Skill</i>			Planting: <u>Seeds:</u> <ul style="list-style-type: none"> Radishes Long beans Lima beans Green beans Swiss chard Garlic (bulbs) Kale Mustard greens*
3. Garden planning Empower and engage students in planning the garden during the year. Students can help: <ul style="list-style-type: none"> Varieties of seasonal crops to grow Special projects in the garden ☼ Garden extensions ☼ Main gardens (if one doesn't exist) ☼ Pollinator gardens (if one doesn't exist)	<ul style="list-style-type: none"> August/September Appendix Crop Planning with Seed Catalogs Lesson 	Pre-K - 2 <ul style="list-style-type: none"> roots stem flowers seeds fruit replenish 	<u>Transplants:</u> <ul style="list-style-type: none"> Broccoli Cabbage* Cauliflower Collard greens Cucumbers Squash Kale kohlrabi
4. Digging Sweet Potatoes If sweet potatoes are growing in the garden harvest them in August, September or October. <ul style="list-style-type: none"> Start a "Garden Suspect File Report" sheet in the garden journal to record information about sweet potatoes at harvest. Complete the remainder of the report in May when students plant sweet 	<ul style="list-style-type: none"> Root Vegetables 		

<p>potatoes for the next fall harvest.</p> <ul style="list-style-type: none"> ○ Identifying Plant Parts and Root vegetables <i>*OTG Garden Skill</i> ○ Teach students how to harvest (dig) sweet potatoes <i>*OTG Garden Skill- harvesting</i> 			
<p>5. Planting fall vegetables</p> <p>It's time to plant the first crops of the year.</p> <ul style="list-style-type: none"> ○ Use the "Planting & Harvesting" guide to the right and the August/September Appendix to plant crops with students. ○ Use planting times to teach students how to plant seeds and plants 			
<p>6. Plant parts</p> <p>Anytime in the garden is a good time to teach about plant parts.</p> <ul style="list-style-type: none"> ○ When planting crops, have students identify parts of the plants as they plant them. ○ When planting & harvesting crops have students discover/recall which part of the plant we eat. <ul style="list-style-type: none"> ○ When harvesting sweet potatoes, note that the part we eat is a root. ○ Have students discuss the vines and flowers sweet potatoes produce on top of the ground. <ul style="list-style-type: none"> ○ Did students know sweet potatoes produced vines and flowers? ○ Have they seen vines or flowers similar? ○ Identifying Plant Parts and Root vegetables <i>*OTG Garden Skill</i> 	<ul style="list-style-type: none"> • leaves WFK p. 80-86 • USDA Lesson 1 pp. 23- 		
<p>7. Gardening for Pollinators</p> <p>Monarch butterflies and hummingbirds migrate south through Texas during September and October. Now is a good time to begin teaching students about:</p> <ul style="list-style-type: none"> ○ Monarch conservation ○ Milkweed- The host plant for Monarchs ○ Hummingbirds 	<ul style="list-style-type: none"> • August/September, March, and April appendices • OTG- Hummingbird/ butterfly flight tour • OTG- Butterfly/hummingbird chart- Charting Pollinators 		

<ul style="list-style-type: none"> ○ The Monarch life cycle ○ Host plants and nectar plants <p>These concepts can be stretched out and repeated during the year as opportunities come up and the garden and time permits. The migration season for hummingbirds and Monarchs heading north is March - April providing a good time to revisit these concepts.</p> <p>If there is an existing butterfly garden during this month you might:</p> <ul style="list-style-type: none"> ⊗ Clean out (weed) & feed the plants with students ⊗ Plan a new part of the existing butterfly garden <p>If there isn't a butterfly garden:</p> <ul style="list-style-type: none"> ⊗ Plan a butterfly garden this month or decide on another month to plan it. December & January are good months because you can plan inside when its cold or raining outside. ⊗ Plant zinnia seeds to get some inexpensive & quick butterfly nectar plants up for migration season. 	<ul style="list-style-type: none"> • Pollinator Friendly Garden Lesson 		
<p>8. Make journals</p> <p>Print out and set up journals with students in the beginning of the year. Journals are a great way to increase students' writing skills in an engaging way.</p>	<ul style="list-style-type: none"> • OTG- Journal Template • August/September Appendix 		
<p style="text-align: center;">October</p>			
<ul style="list-style-type: none"> • During October & November monarch butterflies are migrating through the Houston area on their way to over winter in warmer climates. During these months, focus on monarchs & humming birds during lessons. <p>Special Projects * Do according to school needs</p> <ul style="list-style-type: none"> ⊗ Cutting back tropical milkweed- Tropical milkweed ⊗ Install or spruce up butterfly gardens <ul style="list-style-type: none"> ○ Include puddling areas ○ Start a pine needle drive to use as natural mulch for the garden. 			
<p>Activities & Companion Skills</p>	<p>Resource Materials</p>	<p>Vocabulary</p>	<p>Planting & Harvesting</p>

<p>1. Continuing Planting Fall/Winter Crops</p> <p>This month continue to plant fall/winter crops with students. Crops planted at this time of year will yield the largest harvest of the school year, so the more variety you plant now, the better.</p> <ul style="list-style-type: none"> • <u>Seeds</u>- As students continue to plant fall/winter crops, it's a good time to review seed spacing & depth. <i>*OTG Garden Skill</i> <ul style="list-style-type: none"> ▪ Use rulers, yardsticks, and tape measurers in the garden to teach students how to space seeds properly and to reinforce math skills. ▪ Use this time to teach how to read a seed packet properly. <i>*OTG Garden Skill</i> ▪ If basil was planted earlier during the year, it will be producing seeds now. Use this opportunity to show students how to collect seeds. <ul style="list-style-type: none"> • Try to collect enough seeds to give each student a few to plant at home in the spring. • Have students make seed packets with artwork on the front and directions for planting on the back. • Carrots are a student favorite and mid-October- November is prime time for planting carrots in Houston. <ul style="list-style-type: none"> ▪ Use carrot planting as an opportunity to review root vegetables. ▪ Use <i>The Carrot Seed</i> as a literature springboard to planting 	<ul style="list-style-type: none"> • Appendix • Lesson on seed spacing • The Carrot Seed by Ruth Krauss • A Seed Has a Coat (WFK, p 5-9) • Seed Packets (WFK, p 30-34) • Downloadable seed packets 	<ul style="list-style-type: none"> • Nitrogen • Phosphorus • Potassium / Potash 	<p>Harvesting:</p> <ul style="list-style-type: none"> • Basil • Basil seeds <p>Planting:</p> <ul style="list-style-type: none"> • Cilantro • Strawberries • Radishes • Bulb & multiplying onions (10/15) • Swiss chard • Parsley • Kohlrabi * • Cabbage*
<p>2. Observing & Caring for Growing Crops</p> <ul style="list-style-type: none"> • Caring for the garden is the crux of activities in the garden and should always be a primary focus for students. Take time to: <ul style="list-style-type: none"> ○ Establish garden routines ○ Establish garden chores ○ Teach students the proper tools for the proper task ○ Teach students how to properly maintain the garden 	<ul style="list-style-type: none"> • OTG- Seed paper towel seed spacing activity / seed tapes • OTG Seed Planting Information • Garden Maintenance 		

<ul style="list-style-type: none"> Students should be able to see growth in crops that have been planted prior to October. As the plants grow, these concepts can be taught. <ul style="list-style-type: none"> Measurement Photosynthesis Plant development Feeding Thinning <ul style="list-style-type: none"> This is a good time to teach students how to thin crops. Seeds that were planted previously will most likely need to be thinned this month to avoid crowding. See Thinning appendix for directions on how to thin. <i>*OTG Garden Skill</i> 			
<p>3. Preparing the Garden for Hummingbirds and Butterflies and Observing Butterfly Life Cycles</p> <ul style="list-style-type: none"> As Monarchs migrate through the area, now is a good time to take every opportunity to point them out in the garden. This is also a good time to teach students about the unique life cycle of the Monarch. <i>*OTG Garden Skill</i> Insect Cycles. <ul style="list-style-type: none"> Use journals to record observations and new learning. If you have tropical milkweed growing in the garden cut it back to 3-4 inches from the ground this month. This prevents migrating butterflies from laying eggs here rather than in their destination of Mexico. If they lay eggs here, the caterpillars are in danger of freezing. Tropical milkweed is native to Mexico and triggers the butterflies to lay their eggs. Set garden goals to plant native milkweed seeds in early spring. <ul style="list-style-type: none"> Use wildflower seed catalogs to learn about and order native milkweed seeds with students. Native Yellow Sulfur butterfly caterpillars are also visible in the garden at this time of year. Cassia bushes are their host plant. 	<ul style="list-style-type: none"> Insect Cycles (WFK, p.25-26) Yellow Sulfur mini lesson Pollinator Friendly Garden Lesson Charting Pollinators Journals 		

<ul style="list-style-type: none"> ○ If cassia bushes are present in the garden, look for caterpillars. See the “Yellow Sulfur” mini lesson. ○ Make sure not to cut back cassia bushes in the fall so that the caterpillars have food. ○ If you do not have a cassia bush consider planting a bush this month or adding to your butterfly garden goals. Fall is the best time to plant trees and shrubs in the Houston area. ● As hummingbirds continue migrating through: <ul style="list-style-type: none"> ○ Continue to chart the number of birds sited. ○ If no birds are sited use the “Pollinator Friendly Garden” and “Charting Pollinators” lessons to assess why and set goals to add things to the garden to make it hummingbird friendly. 			
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November

Overview of the Month

- During September & October monarch butterflies are migrating through the Houston area on their way to over winter in warmer climates. A few may be still be coming through in November. During these months, focus on monarchs & hummingbirds during lessons.
- November is the month for planting wildflower seeds for spring blooms. We plant bluebonnet seeds this month in our OTG gardens this month.
- We also focus on compost & soil this month. If the school doesn’t have a compost-making area plan to get one going during this month.
- Leafy Greens: By now some of the greens planted in September & October maybe more recognizable to students. Remind them that fall/winter is the time for leafy greens in the garden. Have students walk through the garden to see how many they recognize.
- Fall and winter usher in citrus season in Texas, so if your garden includes these, keep an eye out for ripening fruit and make plans on how to share these with students. If you don’t have any mid-November and mid-February are the best months for planting in our area.

Special Projects *Do according to school needs

- Start a composting program
 - Get school to participate by collecting scraps in cafeteria
 - Send home letter soliciting scraps
 - Start a coffee ground drive

<ul style="list-style-type: none"> Plant a patch of bluebonnets &/or other wildflowers Plant an herb garden- If the garden does not Do a pine needle drive to mulch the beds for winter 			
Activities & Companion Skills	Resource Materials	Vocabulary	Planting & Harvesting
<p>1. Composting</p> <ul style="list-style-type: none"> As the rainy season sets in, some lessons may have to be done indoors, which provides time to plan. Use November to plan a beginning or extension composting plan for the garden. The composting unit can take a lot of time so plan accordingly. If time with students is limited to once a week or less, study composting for the rest of the year. Composting is a perfect way to: <ul style="list-style-type: none"> Engage students in learning how soil is created Teach students how to replenish soil to avoid erosion (remind students of how they replenished the soil with amendments before they planted crops. Compost is another way of replenishing soil.) Link recycling to the garden Engage the whole school in gardening efforts Use journals to record the composting process and observations. As students do chores in the garden throughout the month, engage them in turning the compost pile(s) during each outdoor garden lesson. Add it as a rotation in garden duties. Engage students in checking the health of the compost. See guide to making compost. If there is already compost from previous years, add it to the garden. Note the difference when compost is used. 	<ul style="list-style-type: none"> Introduction Lesson (OTG) OTG- Compost Program- Garden detectives solve how to make soil WFK- p. 10-15 Videos <ul style="list-style-type: none"> How Compost is Made- https://www.youtube.com/watch?v=cBkBWVF FEWw How to Make Compost- Better Homes & Gardens- https://www.bhg.com/gardening/yard/compost/how-to-compost/ <p>Literature Suggestions:</p> <ul style="list-style-type: none"> <i>Compost Stew: An A to Z Recipe for the Earth</i> by Mary McKenna Siddals <i>Diary of a Worm</i> by Doreen Conin <i>Garbage Helps Our Garden Grow: A Compost Story</i> by Linda Glaser & Shelley Rotner <i>The Little Composter</i> by Jan 	<ul style="list-style-type: none"> Compost Decomposition Decomposer Microorganism Nitrogen Carbon Green matter Brown matter Loam 	<p>Planting:</p> <p>Seeds:</p> <ul style="list-style-type: none"> Cilantro Bluebonnets Spinach Carrots Radishes Lettuce* <p>Swiss chard</p> <p>Transplants</p> <ul style="list-style-type: none"> Cabbage Brussels sprouts Swiss chard Kohlrabi* <p>Harvesting:</p> <ul style="list-style-type: none"> Radishes Mustard greens

	Gerardi <ul style="list-style-type: none"> • <i>Wiggling Worms at Work</i> by Wendy Pfeffer • <i>What's Sprouting in my Trash? A Book About Composting</i> By Esther Porter 		
2. Bluebonnets & Wildflowers <ul style="list-style-type: none"> • Plant some bluebonnets- Note that bluebonnet seeds need some preparation before planting, so prepare seeds a day or 2 before planting day. See OTG Planting Wildflower Seeds video and OTG Wildflower Planting Mini Lesson. Companion Skills <ul style="list-style-type: none"> • Planting in season • How to plant a seed 	<ul style="list-style-type: none"> • OTG Mini Lesson • https://www.wildflower.org/learn/how-to/grow-bluebonnets 		
3. Planting Herbs <ul style="list-style-type: none"> • October and November are prime times to start herb gardens in our area. If your garden doesn't have herbs consider planting some this month. Plant in a separate area or mix in between vegetables. Many herbs act as insect repellent, so are helpful to ward off pests from vegetables. <ul style="list-style-type: none"> ○ If herbs are already in the garden <ul style="list-style-type: none"> • Take students on a Tour de Herbs. <ul style="list-style-type: none"> ○ Visit each herb growing. Have students rub the leaves of each to release the scent. What does the herb smell like? How can you use it? What's the name of the herb? ○ Use journals to record learning. ○ Plan a dish or dishes to make using the herbs from the garden. • If there are no herbs in the garden. Consider starting a bed of herbs. See the Appendix & video 	<ul style="list-style-type: none"> • Harvesting seeds • Come to Your Senses! Let's Learn about Herbs • 		

<p>4. Preparing Harvests to Eat</p> <ul style="list-style-type: none"> By now there should be a 1 or 2 things from the fall crops that are ready to harvest, most likely radishes. Find a recipe to prepare with students. Also, if there are citrus trees in the garden, some of them may have fruit that is ready. <ul style="list-style-type: none"> Introduce students to the OTG Tasting Code to model how to try new foods. Lead students in preparing a recipe using some vegetable(s) and herbs ready in the garden. Have students write the recipe on their recipe template so that they can prepare it again at home. If your garden includes citrus trees, see if any are ready for students to taste. 	<ul style="list-style-type: none"> OTG Tasting Vow in Journal Recipe template in journal 		
<p>December</p>			
Activities & Companion Skills	Resource Materials	Vocabulary	Planting & Harvesting
<p>1. Making the Garden Wildlife Ready</p> <ul style="list-style-type: none"> Wintertime is a great time to think about providing food and shelter for wildlife through the garden. <ul style="list-style-type: none"> Use inclement weather days to plan how to increase wildlife in the garden. <ul style="list-style-type: none"> Review the hummingbird and butterfly charts made in September and October. Decide if the number of sightings seem adequate or do students think there should be more sightings of butterflies and hummingbirds. <ul style="list-style-type: none"> If it is decided that more can be done in the garden to make usable habitat for urban wildlife, begin planning options with students. Options may include <ul style="list-style-type: none"> ✓ A water source such as a birdbath or 	<ul style="list-style-type: none"> Wildlife friendly checklist 		<p>* Do according to school needs Lettuce</p>

<p>small frog pond</p> <ul style="list-style-type: none"> ✓ A prairie pocket garden ✓ Trees for birds to nest ✓ Pollinator garden with host & nectar plants ✓ Low bushes or a tall grass are to <p>provide cover for small animals</p>			
<p>2. Identifying plants</p> <ul style="list-style-type: none"> ○ The fall winter garden should be in full stride this month with plenty of leafy greens. This is a good month to really solidify students' ability to identify plants. <ul style="list-style-type: none"> ○ The "Learn Your Leaves" or "Scavenger Hunt" games are good activities to reinforce students plant identification skills. ○ Plant Sensory Cues 	<ul style="list-style-type: none"> • "Learn Your Leaves" game • "Scavenger Hunt" game • USDA- Lesson 1 pp.25 & student Handout 1.3 		
<p>3. Write Investigative Reports on Garden Suspects</p> <ul style="list-style-type: none"> • After students have had practice on identifying plants, extend their skills by completing a few of the "Garden Suspect Case Report" in their journals. <ul style="list-style-type: none"> ○ Students may have begun filling out some of these during planting times in previous months. If so, now is a good time to measure the growth of plants and note growth in the growth section. ○ Continue filling these out when new plants/seeds go in the garden. Complete the growth sections of each sheet as plants grow through the season. ○ When weather permits complete as many of these in the garden as possible on plants that you may have missed earlier, so students can really inspect each plant. Don't forget to come back in later days to record growth! ○ These reports can be compiled as a hard copy for the school library or office to share information with the <p>school community about the garden.</p>	<ul style="list-style-type: none"> • 		

<ul style="list-style-type: none"> ○ Students can also do informational videos about vegetables of their choosing to share with the school, on social media, and at community events. See the appendix for suggestions on making videos. 			
4. Exploring Produce Used in Different Cultural Celebrations Several holidays are celebrated during the winter months so now is a good time to explore how produce from the garden plays a vital part in holiday foods in different cultures.	<ul style="list-style-type: none"> • Recipe template in journals • • • WFK- pp. 112, 157, 175 		
January			
☼ January is an important month for planning the spring garden to get a spring harvest before school ends. ☼ Write a case report on a vegetable in the garden (USDA Lesson 3 & Garden Detective plant Fact Sheet from Journal) ☼ Write & produce a PSA about vegetables researched in case reports. (USDA Lesson 3) ☼ Build worm farm Make Kohlrabi Slaw* (See recipe in Recipe Appendix)			
Lessons & Companion Skills	Resource Materials	Vocabulary	Planting & Harvesting
1. Planning for Second Round Winter & Spring Crops <ul style="list-style-type: none"> • Have students help you plan crops & locations. During this month plan space and time in the garden for: <ul style="list-style-type: none"> ○ When & where you will plant a second round of winter crops <ul style="list-style-type: none"> ✓ Second round winter crops are indicated to the right with “2nd” next to them. ☼ Leave space for spring crops to be planted in February and March or plan to harvest and/or plan to pull up spent winter crops to open more space. <ul style="list-style-type: none"> ○ When & where you will plant spring crops. ○ If you are planning to do the Pizza Garden with students note that the tomatoes will be planted in February while the other ingredients will be planted in March, plan to plant these in the same space if possible. 	<ul style="list-style-type: none"> • Seed catalogs • OTG Vegetable Garden Planting Dates handouts • USDA Lesson 3 & Garden Detective plant Fact Sheet from Journal • Square-foot garden planning sheets • “Planning Crops with Seed Catalogs” lesson • Pizza garden Appendix • How to Plant Tomatoes Appendix 	<ul style="list-style-type: none"> • Decomposer • Thinning • Bolting • Pollination • Pistil (female) • Stamen (male) • Worm casting • Square-foot garden 	Planting: <ul style="list-style-type: none"> • Lettuce* • Radishes* • Broccoli (2nd) • Brussels Sprouts (2nd) • Cabbage (2nd) • Carrots (2nd) • Cauliflower (2nd) • Swiss chard • Collards (2nd) • Kale* • Green onions • Snap peas • Spinach (2nd)

<ul style="list-style-type: none"> Students love viewing seed catalogs. Use the seed catalogs ordered in the beginning of the year to help plan plantings this month. Pay special attention to tomato plant varieties to discover how many different types of tomatoes exist. Check with your local specialty plant shop to see what type of varieties they may stock in February and plan to purchase some unusual varieties. This is a good time to teach about square-foot gardening if the garden is small. 			Harvesting: <ul style="list-style-type: none"> Broccoli Kale Kohlrabi Radishes Mustard greens Collard greens Cilantro
2. Worms: Nature's Decomposers <ul style="list-style-type: none"> January can be cold & rainy so this is a great lesson to do indoors. Use OTG Lesson: The Wonderful World of Worms Link the lesson to previous lessons on composting. 	<ul style="list-style-type: none"> WFK- p. 10-15 OTG- Wonderful World of Worms Worm bins (Plastic shoe boxes w/ lids) Black butcher or construction paper Soil Worms (move to lesson) 		
4. Observing & Caring for Growing Crops <ul style="list-style-type: none"> Continued care for the garden is still a primary focus for students. As needed this month, use the following to properly maintain the garden: <ul style="list-style-type: none"> Established garden routines Established garden chores As crops grow, introduce and reinforce these concepts as needed during maintenance: <ul style="list-style-type: none"> Weeding- If bluebonnets were planted in the fall, teach students how to recognize the plantlets so that they are not mistaken for weeds. Grooming Identifying signs of pest damage Identifying stages of plant development Feeding 			

<ul style="list-style-type: none"> ○ Thinning ○ Turning compost bins 			
3. Stages of seeds <ul style="list-style-type: none"> • While students are planting 2nd winter crops this is a good time to review/teach how a seed grows. Beans can be planted in the garden in March, so to get an early start indoors and allow students to watch the seed germination process, beans can be sprouted in plastic bags, planted in cups, and then transferred to the garden. 	<ul style="list-style-type: none"> • Sprouting Beans Lesson • Beans (from grocery store) • Baggies • Paper towels 		
4. Planting Second Winter Crops <ul style="list-style-type: none"> • After planning for 2nd round winter crops, plant them on a garden workday with students. If time permits or in the class after, complete a “Garden Suspect Case Report” in journals to study 1 plant in detail. 	<ul style="list-style-type: none"> • “Garden Suspect Case Report” in journals • Seeds & transplants 		
February			
☼ February is an important month for planting tomatoes and potatoes to get a spring harvest before school ends. ☼ February is also an important month to get prepared for further spring plantings in the beginning of March to get a spring harvest before school ends. ☼ 2nd: World Wetlands Day ☼ 11th: International Day of Women & Girls in Science			
Lessons & Companion Skills	Resource Materials	Vocabulary	Planting & Harvesting
1. Classifying Vegetables into Families/Subgroups <ul style="list-style-type: none"> • Students should be starting to get the hang of recognizing vegetable plants now. To extend this knowledge, begin teaching them about plant families. ○ Onion, mustard, parsley, grasses & grains, gourd, sunflower & aster, nightshade, pea & bean 	<ul style="list-style-type: none"> • “Plant Families” chart 	<ul style="list-style-type: none"> • Tuber • Root vegetable • Bolt • Alliaceae: Onion Family • Brassicaceae: Mustard Family • Umbeliferae: 	Planting: <ul style="list-style-type: none"> • Potatoes • Tomatoes* • Beets (2nd) • Broccoli (2nd) • Cauliflower (2nd) • Swiss chard • Corn
2. Learning about Root Vegetables-Planting Potatoes <ul style="list-style-type: none"> • February is the month for planting potatoes for a May harvest. 	<ul style="list-style-type: none"> • OTG- The Root of Tubers Lesson 		

<ul style="list-style-type: none"> ○ Use OTG- The Root of Tubers Lesson to teach students how to plant potatoes and plant them. ○ During subsequent garden workdays the potatoes will need to be hilled as plants get taller. Hilling is adding layers of soil to submerge the stem so that additional potatoes will grow along the stems. See the potato lesson for complete instructions. 	<ul style="list-style-type: none"> • Valentine’s Day is for Tomatoes, Potatoes, and Roses? Lesson • <i>Two Old Potatoes and Me</i> by Jon Coy 	Parsley Family <ul style="list-style-type: none"> • Graminae: Grasses & Grains Family • Cucurvitaceae: Gourd Family • Asteraceae: Sunflower & Aster family • Solanaceae: Nightshade Family • Leguminosae: Pea & Bean Family 	<ul style="list-style-type: none"> • Kale* • Parsley • Snap peas
<p>3. Planting Tomatoes- The Star of the Nightshade Family</p> <ul style="list-style-type: none"> • Tomatoes can be a tricky crop to plant. The key is to get them in early. <ul style="list-style-type: none"> ○ Refer to spring garden plans started in January to see where tomatoes will be planted. ○ Refer to local weather forecasts for the month and plan to plant tomatoes right after the last forecasted freeze. ○ Refer to the Appendix for detailed instructions on how to plant tomatoes. ○ If you are planning to do the Pizza Garden with students plan to plant the other crops along with the tomatoes. 	<ul style="list-style-type: none"> • Valentine’s Day is for Tomatoes, Potatoes, and Roses? Lesson • A variety of tomato plants • Forecasted freeze dates • Tomato cages • Journals • Pizza Garden Appendix 		
<p>5. Continuing Spring Crop Planning</p> <ul style="list-style-type: none"> • Have students help you plan crops & locations. During this month plan space and time in the garden for: <ul style="list-style-type: none"> ○ When & where you will plant more second round winter crops if desired. ○ Second round winter crops are indicated to the right with “2nd” next to them. ○ Leave space for spring crops to be planted in March or plan to harvest and/or plan to pull up spent winter crops to open more space. ○ If you are planning to do the Pizza Garden with students plan to plant the other crops along with the tomatoes. 	<ul style="list-style-type: none"> • Pizza Garden Appendix • Seed catalogs • OTG Vegetable Garden Planting Dates handouts • 		

<p>6. Preparing for Spring Seed Collection</p> <ul style="list-style-type: none"> Start checking the garden for plants that may be beginning the seed cycle. Once temperatures begin to warm, most of the leafy green winter crops will begin to flower and seed. Seeding plants often become bitter and so are not as good for eating anymore, but their seeds are valuable, so look for signs of seeding on a regular basis beginning this month. Faithful and prolific seeders include: <ul style="list-style-type: none"> Cilantro Dill Parsley Greens- mustards and collards Bok choy Broccoli (purposely leave at least 1 head for seeding) 	<ul style="list-style-type: none"> 		
<p>7. Observing & Caring for Growing Crops</p> <ul style="list-style-type: none"> Continued care for the garden is still a primary focus for students. As needed this month, use the following to properly maintain the garden: <ul style="list-style-type: none"> Established garden routines Established garden chores As crops grow, introduce and reinforce these concepts as needed during maintenance: <ul style="list-style-type: none"> Weeding- If bluebonnets were planted in the fall, teach students how to recognize the plantlets so that they are not mistaken for weeds. Grooming Identifying signs of pest damage Identifying stages of plant development <ul style="list-style-type: none"> Crops such as broccoli and bokchoy can begin to flower and go to seed quickly. Allow some of the winter crops to flower and go to seed so that students can observe the complete life cycle of the plant. Seeds will begin to be ready to harvest 	<ul style="list-style-type: none"> 		



<p>March – May but begin pointing out the process as it begins in the garden.</p> <ul style="list-style-type: none"> ○ Feeding ○ Thinning ○ Turning compost bins 			
<p>March</p>			
<p>☼ March is THE KEY month to plant spring crops for a plentiful spring harvest before school ends. The earlier crops are planted during this month, the better!</p> <p>☼ The weather is also beautiful in March, so plan to do as many days in the garden as possible!</p> <p>☼ If you're doing pine needle drives to use as free mulch for the garden, this is a good month to hold the second drive for spring mulching.</p> <p>☼ The migration season for Monarch butterflies and hummingbirds heading north from Mexico is March and April in Texas so look for them in the garden. The garden should be abuzz with plenty of other wildlife this month too, so take every opportunity to look for insects, amphibians, and other small animals making their homes in the garden.</p> <p>☼ Spring is a great time to do some fun Spring planting projects. Consider one or two of these fun plantings for spring crops.</p> <ul style="list-style-type: none"> ○ To observe Rodeo season, a fun project for March is growing a haybale garden. This project further extends student knowledge on soil-making, composting, and decomposition. ○ Pizza garden ○ Ratatouille garden 			
Lessons & Companion Skills	Lessons and Appendices	Vocabulary	Planting & Harvesting
<p>1. Planting Main Spring Crops</p> <ul style="list-style-type: none"> • As soon as possible this month, get students in the garden to plant spring crops. <ul style="list-style-type: none"> ○ Use the plans created in January and February. ○ Review and assess student's ability to plant seeds and plants properly during planting time. Remind students of: <ul style="list-style-type: none"> ✓ Proper spacing for transplants and seeds ✓ Proper depth for transplants and seeds ✓ Gentle watering after planting ✓ How to use the proper tools for each task 	<ul style="list-style-type: none"> • Transplants for spring crops • Seeds for spring crops 	<ul style="list-style-type: none"> • Hilling • Annual • Biennial • Perennial • Bolt • Transplant • Taproot • Bone meal 	<p>Planting:</p> <ul style="list-style-type: none"> • Beans • Sunflowers* • Tomatoes* • Basil • Cucumbers* • Eggplant* • Okra* • Black-eyed peas • Peppers • Squash*

<p>2. Growing a Haybale Garden</p> <ul style="list-style-type: none"> To correlate the Houston Livestock Show and Rodeo to the garden consider doing a haybale garden with students this month. Through a process that causes the haybale to begin decomposing into soil in the middle, a haybale can be used for planting. Use the “Growing a Haybale Garden” appendix for instructions. <ul style="list-style-type: none"> Tie the decomposition process to <ul style="list-style-type: none"> ✓ The composting project ✓ Worm farms 	<ul style="list-style-type: none"> Growing a Haybale Garden 		<p>Harvesting:</p> <ul style="list-style-type: none"> Lettuce
<p>3. Observing & Caring for Growing Crops</p> <ul style="list-style-type: none"> Look out for bluebonnets planted in November. They should be blooming now. Continued care for the garden is still a primary focus for students. As needed this month, use the following to properly maintain the garden: <ul style="list-style-type: none"> Established garden routines Established garden chores As crops grow, introduce and reinforce these concepts as needed during maintenance: <ul style="list-style-type: none"> Weeding Grooming Identifying signs of pest damage Identifying stages of plant development Feeding Thinning Turning compost bins 			
<p>4. Release the Worms!</p>			
<p>5. Learning How to Collect Seeds</p> <ul style="list-style-type: none"> Some of the leafy green winter crops may have seed pods on them by now, so before pulling out these plants to make room for spring crops. Use them to teach students how to 			

collect seeds from plants.			
6. Observing Wildlife in the Garden <ul style="list-style-type: none"> March and April make up the migration season for monarch butterflies and hummingbirds that are now making their way back north after overwintering in Mexico. This month: <ul style="list-style-type: none"> Start charting the sightings of butterflies (all types) seen in the garden. <ul style="list-style-type: none"> ✓ Compare the number of sightings during the spring migration season to that of the fall sightings. ✓ Tag some Monarch butterflies and log them on research sites. See the appendix for tagging information 			
April			
☼ April is a wonderful month for students to enjoy the wonders of nature in the garden, so this month the focus is on activities that allow students to explore the garden and appreciate everything in it.			
Activities & Companion Skills	Lessons & Appendices	Vocabulary	Planting & Harvesting
<ul style="list-style-type: none"> Exploring and Appreciating the Garden <ul style="list-style-type: none"> This month is all about helping students enjoy the fruit of their labor. The appendix associated with activity to choose exploratory activities for students to complete in the garden. During April, prompt students to notice and articulate findings in the garden. Examples: <ul style="list-style-type: none"> Which flowers are blooming? Can you name them? There are several hundred types of bees native to Texas. How many different types of bees can you spot? Which vegetables seem ready to harvest? How can 	<ul style="list-style-type: none"> Exploring and Appreciating the Garden Appendix 	<ul style="list-style-type: none"> Propagation Pollination Beneficial insect Pest Integrated Pest Management Legume Bluebonnet Powdery 	Planting: <ul style="list-style-type: none"> Sweet potatoes Pumpkins Watermelon Harvesting: <ul style="list-style-type: none"> Beets Cabbage Carrots Collard Greens

<p>you tell.</p> <ul style="list-style-type: none"> • Use the OTG Spiral for spontaneous activities. 		<p>mildew</p> <ul style="list-style-type: none"> • Squash vine bore 	<ul style="list-style-type: none"> • Kale • Kohlrabi • Green onions • Mustard Greens • Peppers • Swiss chard • Tomatoes • Yellow squash • Zucchini
<ul style="list-style-type: none"> • Harvesting and Sampling Produce from the Garden <ul style="list-style-type: none"> • April should also produce an abundance of vegetables that are ready to harvest. Check the garden regularly for: <ul style="list-style-type: none"> ○ Leaves on leafy greens that are ready to harvest from winter crops ○ Early spring producers like yellow squash and zucchini ○ Late winter root vegetables such as carrots and beets • Have students help you find recipes to try with produce from the garden. <ul style="list-style-type: none"> ○ Plan to make and share some dishes made with produce from the garden with school staff for teacher and staff appreciation days. ○ Plan to give some gift baskets of produce to people in the school community like secretaries, volunteers, teachers or others. ○ Make pickled and/or roasted beets ○ Make pickles from cucumbers • Now that students have been growing their own vegetables and sampling them, many students who were sworn vegetable haters in the beginning of the year, may now be more open to trying a variety of new foods. Capitalize on their new attitudes and encourage students to up their vegetable consumption: <ul style="list-style-type: none"> ○ Have students evaluate their meals at school and at home and set goals for eating more fruits & veggies. ○ Hold a fruit & vegetable eating contest ○ Engage parents and the school community in ways to eat more vegetables. <ul style="list-style-type: none"> ✓ Use case reports and videos that students may have made earlier in the year to engage the school community in making healthier 			

<p>eating choices.</p> <ul style="list-style-type: none"> ✓ Hold a school-wide contest to see who's the champion vegetable eater in the school. Consider giving a basket of school garden produce to the winner. 			
<p>3. Celebrating Earth Day</p> <ul style="list-style-type: none"> National Earth Day is celebrated on April 22nd of each year. Plan a fun garden activity with students for the whole school to enjoy. <ul style="list-style-type: none"> Engage volunteers in helping carry out the activities If there are no fruit trees in the garden, consider planting one Create a history of the garden to share at the Earth Day event 			
<p>4. Observing & Caring for Growing Crops</p> <ul style="list-style-type: none"> Continued care for the garden is still a primary focus for students. As needed this month, use the following to properly maintain the garden: <ul style="list-style-type: none"> Established garden routines Established garden chores As crops grow, introduce and reinforce these concepts as needed during maintenance: <ul style="list-style-type: none"> Weeding Grooming Identifying signs of pest damage- Spring brings more pests to the garden, so emphasize this task this month. Use the correlating Appendix to do a lesson on garden pests. Identifying stages of plant development Feeding Thinning Turning compost bins 	<ul style="list-style-type: none"> Identifying Pests in the Garden 		

5. Collect seeds in the Garden <ul style="list-style-type: none">Continue to collect seeds in the garden this month from<ul style="list-style-type: none">Bluebonnets- Bluebonnets are part of the legume family, so the students may mistake their seed pods for green beans. Note that bluebonnet pods are fuzzy whereas green beans are not.CilantroDillParsleyGreens- mustards and collardsLet one or two carrots stay in the garden to go to seed. The seeds will be ready in the fall of the next school year.	<ul style="list-style-type: none">Learning How to Collect Seeds Appendix		
Rooting Sweet Potatoes <ul style="list-style-type: none">Purchase sweet potatoes to start the process for planting sweet potatoes in May.If sweet potatoes were grown in the garden the year before, there may be some vines beginning to pop up in the garden on their own. If so, snip pieces of the vines and place them in water to start rooting to create additional plants.	<ul style="list-style-type: none">Growing Sweet Potatoes Appendix		
May			
 International Composting Awareness Week is the first full week in May.  Make a cookbook of class family recipes using vegetables grown during the year. (USDA Lesson 7) <ul style="list-style-type: none">Ask school community to contributeUse a photo of kids in garden for coverSell books for garden fundraisers			
Activities & Companion Skills	Resource Materials	Vocabulary	Planting & Harvesting

<p>1. Harvesting Potatoes</p> <ul style="list-style-type: none"> • The potatoes planted in February will be ready to harvest this month. Digging potatoes is one of the activities students enjoy most during the year. Enjoy potato harvesting day! • Use the OTG The Root of Tubers Lesson for instructions on how to harvest potatoes. • Use the potatoes in a few recipes so students can taste the fruits of their labor. • If there's enough potatoes for each student to take home, consider distributing them that way. 	<ul style="list-style-type: none"> • The Root of Tubers Lesson 	<ul style="list-style-type: none"> • Cover crop • Crop rotation • Microclimate • Native bee • Nitrogen fixing 	<p>Planting:</p> <ul style="list-style-type: none"> • Sweet potatoes* • Pumpkins • Watermelon <p>Harvesting:</p> <ul style="list-style-type: none"> • Potatoes • Okra • Eggplants • Sunflower seeds • Cucumbers • Squash • Tomatoes
<p>2. Preparing the Garden for Summer</p> <ul style="list-style-type: none"> • An important process during this month is get the garden ready for summer. To do this: <ul style="list-style-type: none"> ○ Add pine needle mulch if needed to conserve water and deter weeds. ○ Pull out any remaining late winter plants. ○ Harvest all vegetables that are ready. Give as many away to students as possible. <ul style="list-style-type: none"> ✓ Remind students of the letter sent home to parents in the beginning of the school year and recipes collected throughout the school year to help them decide how to prepare the vegetables they take home. ○ If more than sweet potatoes will be left in the garden over the summer: <ul style="list-style-type: none"> ✓ Seek volunteers to water periodically during the summer and make a schedule of who will water and when. ✓ If summer school will be in session on campus, invite summer school teachers to harvest from the garden so that produce does not go to 			

waste.			
3. Plant Sweet Potatoes <ul style="list-style-type: none"> Planting sweet potatoes before school ends serves two purposes. <ul style="list-style-type: none"> They will provide a crop for students to harvest upon returning to school in the next school year. They provide a cover crop to keep weeds down and replenish the soil during the summer. Let this be one of the last activities students do in the garden for the year. Tell students they are planting sweet potatoes as a gift for students who will come to the garden new next year. Use the sweet potato slips you started growing in April to plant your crop. 	<ul style="list-style-type: none"> Root of Tubers lesson 		
4. Review Skills Learned <ul style="list-style-type: none"> As time permits, review the skills students have learned in the garden throughout the year. This is a great time for students to showcase what they have learned in the garden throughout the year. Consider having students plan a garden showcase for the school community highlighting things grown, activities, learning, awards, additions to the gardens, and special moments. 			

APPENDIX F

Produce in School-Garden Program

Fall/ Winter Garden

1. Radishes
2. Long beans
3. Lima beans
4. Green beans
5. Swiss chard
6. Garlic (bulbs)
7. Kale
8. Mustard greens
9. Broccoli
10. Cabbage
11. Cauliflower
12. Collard greens
13. Kohlrabi
14. Onions
15. Carrots
16. Lettuce
17. Sugar snap peas
18. Sweet peas

Spring Garden

1. Potatoes
2. Tomatoes
3. Cucumbers
4. Eggplant
5. Okra
6. Black-eyed peas
7. Peppers
8. Yellow Squash
9. Zucchini
10. Sweet potatoes

APPENDIX G

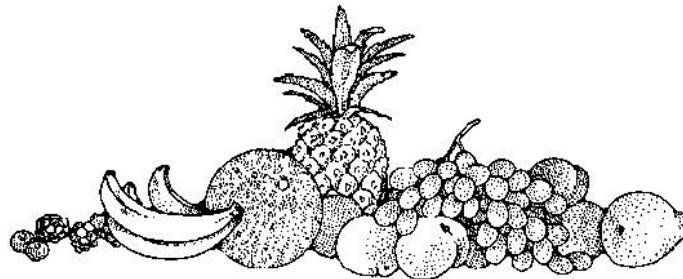
School Garden Video Lessons and Activities

1. Making Tomato Pie with Tomatoes from the Garden.
<https://www.girlonthegrow.com/media/post/2648275362047293603>. Accessed November 5, 2020.
2. Hey Kiddos! It's Time to Dig Potatoes!
<https://www.girlonthegrow.com/media/post/2888452692433658857>. Accessed November 5, 2020.
3. Making a Native Plant Terrarium.
<https://www.girlonthegrow.com/media/post/3181997554457813476>. Accessed November 5, 2020.
4. Collecting Seeds.
<https://www.girlonthegrow.com/media/post/5404076700956512231>. Accessed November 5, 2020.
5. Preparing Sweet Potato Slips.
<https://www.girlonthegrow.com/media/post/4945652658567065831>. Accessed November 5, 2020.
6. Planting Sunflowers!
<https://www.girlonthegrow.com/media/post/3877867925178815719>. Accessed November 5, 2020.
7. Getting Out in the Garden for Good!
<https://www.girlonthegrow.com/media/post/4238748882643410580>. Accessed November 5, 2020.
8. School Garden Post 2: Let's Plant & Sprout!
<https://www.girlonthegrow.com/media/post/1680560250243763195>. Accessed November 5, 2020.
9. A Special Post for my Garden Kiddos!
<https://www.girlonthegrow.com/media/post/1474317963551025116>. Accessed November 5, 2020

APPENDIX H

National Cancer Institute's (NCI) "All-Day" Screener

NATIONAL INSTITUTES OF HEALTH
EATING AT AMERICA'S TABLE STUDY
QUICK FOOD SCAN



- The person who completed the telephone interviews for the Eating at America's Table Study should fill out this questionnaire.
- Use only a No. 2 pencil.
- Be certain to completely blacken in each of the answers, and erase completely if you make any changes.
- Do not make any stray marks on this form.
- When you complete this questionnaire, please return it in the postage-paid envelope to:

National Cancer Institute
EPN, Room 313
6130 Executive Blvd., MSC 7344
Bethesda, MD 20892-7344

BAR
CODE
LABEL
HERE

NOTIFICATION TO RESPONDENT OF ESTIMATED BURDEN

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: NIH, Project Clearance Office, 6701 Rockledge Drive, MSC 7730, Bethesda, MD 20892-7730, ATTN: PRA (0925-0450). Do not return the completed form to this address.

PLEASE DO NOT WRITE IN THIS AREA



SERIAL

INSTRUCTIONS

- Think about what you usually ate last month.
- Please think about all the fruits and vegetables that you ate last month. Include those that were:
 - raw and cooked,
 - eaten as snacks and at meals,
 - eaten at home and away from home (restaurants, friends, take-out), and
 - eaten alone and mixed with other foods.
- Report how many times per month, week, or day you ate each food, and if you ate it, how much you usually had.
- If you mark "Never" for a question, follow the "Go to" instruction.
- Choose the best answer for each question. Mark only one response for each question.

1. Over the last month, how many times per month, week, or day did you drink **100% juice** such as orange, apple, grape, or grapefruit juice? **Do not count** fruit drinks like Kool-Aid, lemonade, Hi-C, cranberry juice drink, Tang, and Twister. Include juice you drank at all mealtimes and between meals.

☐ Never
(Go to
Question 2)
 ☐ 1-3
times
last month
 ☐ 1-2
times
per week
 ☐ 3-4
times
per week
 ☐ 5-6
times
per week
 ☐ 1
time
per day
 ☐ 2
times
per day
 ☐ 3
times
per day
 ☐ 4
times
per day
 ☐ 5 or more
times
per day

- 1a. Each time you drank **100% juice**, how much did you usually drink?

☐ Less than $\frac{3}{4}$ cup
(less than 6 ounces)
 ☐ $\frac{3}{4}$ to $1\frac{1}{4}$ cup
(6 to 10 ounces)
 ☐ $1\frac{1}{4}$ to 2 cups
(10 to 16 ounces)
 ☐ More than 2 cups
(more than 16 ounces)

2. Over the last month, how many times per month, week, or day did you eat **fruit**? Count any kind of fruit—fresh, canned, and frozen. **Do not count** juices. Include fruit you ate at all mealtimes and for snacks.

☐ Never
(Go to
Question 3)
 ☐ 1-3
times
last month
 ☐ 1-2
times
per week
 ☐ 3-4
times
per week
 ☐ 5-6
times
per week
 ☐ 1
time
per day
 ☐ 2
times
per day
 ☐ 3
times
per day
 ☐ 4
times
per day
 ☐ 5 or more
times
per day

- 2a. Each time you ate **fruit**, how much did you usually eat?

☐ Less than 1 medium fruit
 ☐ 1 medium fruit
 ☐ 2 medium fruits
 ☐ More than 2 medium fruits
 OR
☐ Less than $\frac{1}{2}$ cup
 ☐ About $\frac{1}{2}$ cup
 ☐ About 1 cup
 ☐ More than 1 cup

3. Over the last month, how often did you eat **lettuce salad (with or without other vegetables)**?

☐ Never
(Go to Question 4)
 ☐ 1-3 times last month
 ☐ 1-2 times per week
 ☐ 3-4 times per week
 ☐ 5-6 times per week
 ☐ 1 time per day
 ☐ 2 times per day
 ☐ 3 times per day
 ☐ 4 times per day
 ☐ 5 or more times per day

3a. Each time you ate **lettuce salad**, how much did you usually eat?

☐ About ½ cup
 ☐ About 1 cup
 ☐ About 2 cups
 ☐ More than 2 cups

4. Over the last month, how often did you eat **French fries or fried potatoes**?

☐ Never
(Go to Question 5)
 ☐ 1-3 times last month
 ☐ 1-2 times per week
 ☐ 3-4 times per week
 ☐ 5-6 times per week
 ☐ 1 time per day
 ☐ 2 times per day
 ☐ 3 times per day
 ☐ 4 times per day
 ☐ 5 or more times per day

4a. Each time you ate **French fries or fried potatoes**, how much did you usually eat?

☐ Small order or less
(About 1 cup or less)
 ☐ Medium order
(About 1½ cups)
 ☐ Large order
(About 2 cups)
 ☐ Super Size order or more
(About 3 cups or more)

5. Over the last month, how often did you eat **other white potatoes**? Count **baked, boiled, and mashed potatoes, potato salad, and white potatoes that were not fried**.

☐ Never
(Go to Question 6)
 ☐ 1-3 times last month
 ☐ 1-2 times per week
 ☐ 3-4 times per week
 ☐ 5-6 times per week
 ☐ 1 time per day
 ☐ 2 times per day
 ☐ 3 times per day
 ☐ 4 times per day
 ☐ 5 or more times per day

5a. Each time you ate **these potatoes**, how much did you usually eat?

☐ 1 small potato or less
(½ cup or less)
 ☐ 1 medium potato
(½ to 1 cup)
 ☐ 1 large potato
(1 to 1½ cups)
 ☐ 2 medium potatoes or more
(1½ cups or more)

6. Over the last month, how often did you eat **cooked dried beans**? Count **baked beans, bean soup, refried beans, pork and beans and other bean dishes**.

☐ Never
(Go to Question 7)
 ☐ 1-3 times last month
 ☐ 1-2 times per week
 ☐ 3-4 times per week
 ☐ 5-6 times per week
 ☐ 1 time per day
 ☐ 2 times per day
 ☐ 3 times per day
 ☐ 4 times per day
 ☐ 5 or more times per day

6a. Each time you ate **these beans**, how much did you usually eat?

☐ Less than ½ cup
 ☐ ½ to 1 cup
 ☐ 1 to 1½ cups
 ☐ More than 1½ cups

7. Over the last month, how often did you eat **other vegetables**?

- DO NOT COUNT:**
- Lettuce salads
 - White potatoes
 - Cooked dried beans
 - Vegetables in mixtures, such as in sandwiches, omelets, casseroles, Mexican dishes, stews, stir-fry, soups, etc.
 - Rice

COUNT: • All other vegetables—raw, cooked, canned, and frozen

☐ Never
(Go to
Question 8)

☐ 1-3
times
last month

☐ 1-2
times
per week

☐ 3-4
times
per week

☐ 5-6
times
per week

☐ 1
time
per day

☐ 2
times
per day

☐ 3
times
per day

☐ 4
times
per day

☐ 5 or more
times
per day

7a. Each of these times that you ate **other vegetables**, how much did you usually eat?

☐ Less than ½ cup

☐ ½ to 1 cup

☐ 1 to 2 cups

☐ More than 2 cups

8. Over the last month, how often did you eat **tomato sauce**? Include tomato sauce on pasta or macaroni, rice, pizza and other dishes.

☐ Never
(Go to
Question 9)

☐ 1-3
times
last month

☐ 1-2
times
per week

☐ 3-4
times
per week

☐ 5-6
times
per week

☐ 1
time
per day

☐ 2
times
per day

☐ 3
times
per day

☐ 4
times
per day

☐ 5 or more
times
per day

8a. Each time you ate **tomato sauce**, how much did you usually eat?

☐ About ¼ cup

☐ About ½ cup

☐ About 1 cup

☐ More than 1 cup

9. Over the last month, how often did you eat **vegetable soups**? Include tomato soup, gazpacho, beef with vegetable soup, minestrone soup, and other soups made with vegetables.

☐ Never
(Go to
Question 10)

☐ 1-3
times
last month

☐ 1-2
times
per week

☐ 3-4
times
per week

☐ 5-6
times
per week

☐ 1
time
per day

☐ 2
times
per day

☐ 3
times
per day

☐ 4
times
per day

☐ 5 or more
times
per day

9a. Each time you ate **vegetable soup**, how much did you usually eat?

☐ Less than 1 cup

☐ 1 to 2 cups

☐ 2 to 3 cups

☐ More than 3 cups

10. Over the last month, how often did you eat **mixtures that included vegetables**? Count such foods as sandwiches, casseroles, stews, stir-fry, omelets, and tacos.

☐ Never

☐ 1-3
times
last month

☐ 1-2
times
per week

☐ 3-4
times
per week

☐ 5-6
times
per week

☐ 1
time
per day

☐ 2
times
per day

☐ 3
times
per day

☐ 4
times
per day

☐ 5 or more
times
per day

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Thank you very much for completing this questionnaire.
Please return it in the enclosed, postage-paid envelope or to the
address listed on the front page.




APPENDIX I
Food Preference Survey

Food Preferences Survey

Grade: 3rd Grade

Student Name:

Teacher:

How much do you like these fruits and vegetables? Please check your answer				
Fruits and Vegetables	I like this a lot 	I like this a little 	I do not like this 	I don't know what this is 
Banana				
Black-eyed Peas				
Broccoli				
Cabbage				
Carrot				
Cauliflower				
Collard Greens				
Cucumbers				
Eggplant				
Garlic				
Green Beans				
Kale				
Kohlrabi				
Lettuce				
Lima Beans				
Long Beans				
Mushroom				
Mustard Greens				
Nectarine				
Okra				
Onion				
Orange				
Peach				
Pear				
Peppers				
Potato				
Plum				
Radish				
Strawberry				
Sugar Snap Peas				
Swiss Chard				
Sweet Peas				
Sweet Potato				
Tomato				
Watermelon				
Yellow Squash				
Zucchini				

APPENDIX J

Questionnaire on Influences on FJV [Fruit, Juice, and Vegetable] Availability Abridged

QUESTIONNAIRE ON INFLUENCES ON FJV AVAILABILITY

Abridged

Name: _____ Email: _____

2. Are you the person who usually does the food shopping and makes the decisions about what foods to buy for your family?

☐ yes

☐ no

7. Do you ever check for fruit or 100% juice that are on sale?

☐ yes

☐ no (Go to Q8)

How often you check for fruit or 100% juice that are on sale...

7b. ...before going to the grocery store.	<input type="checkbox"/> all the time	<input type="checkbox"/> most of the time	<input type="checkbox"/> sometimes	<input type="checkbox"/> rarely	<input type="checkbox"/> never
7c. ...when you get to the grocery store.	<input type="checkbox"/> all the time	<input type="checkbox"/> most of the time	<input type="checkbox"/> sometimes	<input type="checkbox"/> rarely	<input type="checkbox"/> never

8. Do you ever check for vegetables that are on sale?

☐ yes

☐ no (Go to Q9)

How often you check for vegetables that are on sale...

8b. ...before going to the grocery store.	<input type="checkbox"/> all the time	<input type="checkbox"/> most of the time	<input type="checkbox"/> sometimes	<input type="checkbox"/> rarely	<input type="checkbox"/> never
8c. ...when you get to the grocery store.	<input type="checkbox"/> all the time	<input type="checkbox"/> most of the time	<input type="checkbox"/> sometimes	<input type="checkbox"/> rarely	<input type="checkbox"/> never

13. Do you ever read the label to learn the nutrients in the food?

☐ yes

☐ no (Go to Why fruits and vegetables?)

13b. How often do you read the label? (check only one)

☐ all the time

☐ most of the time

☐ sometimes

☐ rarely

Why fruits and vegetables?

Please mark if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each statement.

14. I buy fruit because...

a. ...they are good for your health.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
b. ...they taste good.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
c. ...they are inexpensive.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
d. ...they are easy to prepare.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
e. ...I grew up eating them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
f. ...of the vitamins and minerals that they have.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
g. ...I need them for what I am preparing.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
h. ...I like to eat them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
i. ...my children like to eat them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
j. ...my spouse likes to eat them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	<input type="checkbox"/> no spouse
k. Is there another reason why you buy fruit? (specify) _____	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	

Please mark if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each statement.

15. I buy vegetables because...

a. ...they are good for your health.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
b. ...they taste good.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
c. ...they are inexpensive.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
d. ...they are easy to prepare.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
e. ...I grew up eating them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
f. ...of the vitamins and minerals that they have.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
g. ...I need them for what I am preparing.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
h. ...I like to eat them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
i. ...my children like to eat them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	
j. ...my spouse likes to eat them.	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	<input type="checkbox"/> no spouse
k. Is there another reason why you buy vegetable? (specify) _____	<input type="checkbox"/> strongly agree	<input type="checkbox"/> somewhat agree	<input type="checkbox"/> not sure	<input type="checkbox"/> somewhat disagree	<input type="checkbox"/> strongly disagree	

The next statements will ask you to compare two things: fresh fruit with canned, bottled or frozen fruit.

**16. Comparing fresh with canned, bottled and frozen fruit, would you say that fresh or canned/
 bottled/frozen fruit...**

a. ...are better for your health?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
b. ...taste better?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
c. ...are less expensive?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
d. ...are easier to prepare?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
e. ...are quicker to prepare?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
f. ...are the kind you grew up eating?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
g. ...are the kind you need for what you are preparing?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
h. ...are the kind you enjoy?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
i. ...are the kind your children prefer?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
j. ...are the kind your spouse prefers?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	<input type="checkbox"/> no spouse

The next statements will ask you to compare fresh vegetables with canned, bottled or frozen vegetables.

17. Comparing fresh with canned, bottled and frozen vegetables, would you say that fresh or canned/bottled/frozen vegetables... (

a. ...are better for your health?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
b. ...taste better?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
c. ...are less expensive?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
d. ...are easier to prepare?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
e. ...are quicker to prepare?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
f. ...are the kind you grew up eating?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
g. ...are the kind you need for what you are preparing?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
h. ...are the kind you enjoy?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
i. ...are the kind your children prefer?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	
j. ...are the kind your spouse prefers?	<input type="checkbox"/> fresh always	<input type="checkbox"/> fresh most of the time	<input type="checkbox"/> fresh and canned about equal	<input type="checkbox"/> not sure	<input type="checkbox"/> canned most of the time	<input type="checkbox"/> canned always	<input type="checkbox"/> no spouse

Home FJV Availability:

21. In the last week did you have the following in your home?

If yes: Please indicate if the food was fresh, frozen or canned?

Food	Yes	No	Fresh	Frozen	Canned	Other
a. Peaches	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
b. 100% Apple Juice	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
c. 100% Grape Juice	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
d. 100% Orange Juice	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
e. Bananas	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
f. Apples	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
g. Cantaloupe or Musk Melon	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
h. Grapes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
i. Oranges	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
j. Pears	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
k. Plums	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
l. Kiwi	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
m. Fruit Salad or Fruit Cocktail	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
n. Applesauce	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
o. Watermelon	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
p. Dried Fruit	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
q. Carrots	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
r. Celery	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
s. Greens (collard, mustard, or turnip)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
t. Spinach	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
u. Frozen French Fried Potatoes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
v. Potato Salad	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
w. Mashed Potatoes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
x. Other White Potatoes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
y. Corn	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
z. Green Peas	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
aa. Tomatoes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
bb. Broccoli	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
cc. Lettuce	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
dd. Green, String, or Snap Beans	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
ee. Cole Slaw	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
ff. Other Cabbage	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
gg. Beans (e.g. pork 'n beans, pinto, black-eyed peas)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other
hh. Refried Beans	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Fresh	<input type="checkbox"/> Frozen	<input type="checkbox"/> Canned	<input type="checkbox"/> Other

Family Social Support for Healthy Shopping:

22. Please indicate on a scale of 1 to 5, where 1 is never and 5 is very often, how often has your family done or said the following during the previous 3 months. By family I mean people living in your household. In the last 3 months, how often has your family...

Scale: 1 = never

5 = very often

- a. ☐ Discussed purchasing fruit or 100% juice with you.
- b. ☐ Reminded you to purchase fruit or 100% juice.
- c. ☐ Approved when you purchased fruit or 100% juice.
- d. ☐ Purchased fruit or 100% juice themselves.
- e. ☐ Asked you to purchase fruit or 100% juice.
- f. ☐ Criticized the fruit or 100% juice you purchased.
- g. ☐ Discussed purchasing vegetables with you.
- h. ☐ Reminded you to purchase vegetables.
- i. ☐ Approved when you purchased vegetables.
- j. ☐ Purchased vegetables themselves.
- k. ☐ Asked you to purchase vegetables.
- l. ☐ Criticized the vegetables you purchased.

Family Meal Patterns:

The next questions refer to what your family usually does at dinnertime.

23. How many times a week does your family usually eat at a fast food place, cafeteria, buffet, or full service restaurant for dinner?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3

- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7

24. How many times a week does your family usually purchase something prepared away from home and eat it at home for dinner?

- ☐ 0

- ☐ 4

- ☐ 1
- ☐ 2
- ☐ 3

- ☐ 5
- ☐ 6
- ☐ 7

25. How many times a week do you usually sit down with your whole family for the dinner meal?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3

- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7

APPENDIX K

USDA's US Household Food Security Survey

U.S. Household Food Security Survey Module: Six-Item Short Form

Economic Research Service, USDA

September 2012

FILL INSTRUCTIONS: Select the appropriate fill from parenthetical choices depending on the number of persons and number of adults in the household.

HH3. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 30-days.

The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more.

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ DON'T KNOW or Refused

HH4. (I/we) couldn't afford to eat balanced meals.

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ DON'T KNOW or Refused

AD1. In the last 30-days, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

☐ Yes

☐ No (Skip AD1a)

☐ DON'T KNOW (Skip AD1a)

AD1a. [IF YES ABOVE,] In the last 30 days, how many days did this happen?

_____ days

☐ DON'T KNOW

AD2. In the last 30-days, did you ever eat less than you felt you should because there wasn't enough money for food?

☐ Yes

☐ No

☐ DON'T KNOW

AD3. In the last 30-days, were you every hungry but didn't eat because there wasn't enough money for food?

☐ Yes

☐ No

☐ DON'T KNOW