2017

# Effects Of A Cooking Program On Social Skills, Adaptive Functioning, And Dietary Behavior Of Adolescents With Autism Spectrum Disorder

Eva Phui Phui Trinh
*University of Alabama at Birmingham*

# EFFECTS OF A COOKING PROGRAM ON SOCIAL SKILLS, ADAPTIVE FUNCTIONING, AND DIETARY BEHAVIOR OF ADOLESCENTS WITH AUTISM SPECTRUM DISORDER

by

EVA TRINH

FRED BIASINI, COMMITTEE CHAIR
BRENDA BERTRAND
KRISTI C. GUEST
SARAH O'KELLEY
MARTHA S. WINGATE

A DISSERTATION

Submitted to the graduate faculty of The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy.

BIRMINGHAM, ALABAMA

2017

EFFECTS OF A COOKING PROGRAM ON SOCIAL SKILLS, ADAPTIVE FUNCTIONING, AND DIETARY BEHAVIOR OF ADOLESCENTS WITH AUTISM SPECTRUM DISORDER

EVA TRINH

LIFESPAN DEVELOPMENTAL PSYCHOLOGY PROGRAM

ABSTRACT

Autism Spectrum Disorder (ASD) is characterized by two domains: 1) deficits in social interaction and communication, and, 2) restricted and repetitive behavior, interests, or activities. Poor adaptive functioning skills is an associated feature of ASD and leads to concerns for establishing independence as adolescents with ASD transition into adults. The dietary behavior of adolescents in the United States do not meet national standards for healthy eating, which could lead to poor health outcomes. Eating and feeding problems are more prevalent in children with ASD compared to their typically developing peers. Independent skills and health are a main source of stress for parents of children with ASD. The objective of the current study was to pilot the development of a multi-component CHEF cooking program for adolescents with ASD to improve their mealtime social skills, adaptive functioning, and dietary behavior, as well as their primary caregiver's experience of parenting stress. After participating in the program, adolescents with ASD improved their dietary behavior and independently cooked more often at home, $t(6) = 3.87$, $p < .05$. Adolescent participants were reported by their parents to significantly expand the variety of fruits, $t(6) = 2.49$, $p < .05$, and vegetables, $t(6) = 2.48$, $p < .05$ accepted into their diet. Caregiver stress approached

significantly high levels and were maintained at this level after adolescents participated in the program ($p > .05$). Qualitative data supported an in-depth understanding of study findings by showing adolescents acceptance for various fruits and vegetables into their diet, improved social skills with the family related to mealtime, and confidence in their cooking skills. In conclusion, the pilot of the CHEF cooking program was successful in improving dietary behavior of adolescents with ASD. Future directions should refine the program by incorporating a greater focus on other skills and include a parent component.

*Keywords:* autism, adolescents, daily living skills, social skills, nutrition, eating behavior

TABLE OF CONTENTS

*Page*

LIST OF TABLES

LIST OF FIGURES

# INTRODUCTION

The first published depiction of "autism" by Leo Kanner (1943) described the syndrome in 11 children. Today, Autism Spectrum Disorder (ASD) is known as a neurodevelopmental disorder characterized by two domains: 1) deficits in social interaction and communication, and, 2) restricted and repetitive behavior, interests, or activities (American Psychiatric Association, 2013). The most recent prevalence report by the Centers for Disease Control and Prevention estimated about 1 in 68 children meet criteria for an ASD, with 4.5 more boys meeting the criteria compared to girls (Christensen et al., 2016). Associated features of ASD include intellectual impairment, motor deficits, anxiety, depression, self-injurious behavior, and poor adaptive functional skills (American Psychiatric Association, 2013). Adaptive behaviors include daily living skills that help an individual function independently, take care of their own health, and prepare meals (Sparrow, Cicchetti, & Balla, 2005). Deficits in social skills and poor adaptive functioning skills lead to concerns for establishing independence as children and adolescents with ASD transition into adulthood (American Psychiatric Association, 2013; Kanne et al., 2011; Kenworthy, Case, Harms, Martin, & Wallace, 2010; Stoner, Angell, House, & Bock, 2007).

There are two types of transition, vertical and horizontal (Kagan & Neuman, 1998; Polloway, Patton, & Serna, 2001). Vertical transition refers to major changes such as beginning a new school year or transitioning into adulthood (Kagan & Neuman,

1998). Horizontal transition refers to minor changes such as transitioning between daily activities (Polloway, Patton, & Serna, 2001). These horizontal transitions are specific to each individual and can be unpredictable. For children with ASD, these transitions can be challenging, stressful, and anxiety provoking. As adolescents transition into adulthood, developing their ability to cook food and incorporate adequate nutrition into their diets are important for independent functioning.

The goals for children and adolescents with ASD are no different than for their peers, which is to provide them with opportunities to learn skills that will increase their personal independence and social responsibility (Hendricks & Wehman, 2016; Kavale, Forness, & Siperstein, 1999). Successful transition into adulthood for youth with ASD may include achieving a wide array of outcomes such as attending college, employment, integrating into the community, self-management, and independent functioning (Hendricks & Wehman, 2016). It is essential to take advantage of the adolescent period to start teaching daily living skills to prepare adolescents for successful independent living as they transition into adulthood.

A small percentage of adults with ASD are reported to live alone (Billstedt, Gillberg, & Gillberg, 2005; Hendricks & Wehman, 2016; Howlin, Goode, Hutton, & Rutter, 2004). A large proportion of adults with ASD continue to reside with their parents at home if they are not residing in an institution or supervised community residence (Billstedt, Gillberg, & Gillberg, 2005; Howlin, Goode, Hutton, & Rutter, 2004). The meaning of a successful transition into adulthood for youth with ASD has changed over time (Henninger & Taylor, 2013). Early research has measured successful outcomes

as not being institutionalized. Over time, successful outcomes are measured by the individual's goals, friendships, employment, and living arrangements. Low cognitive ability and language deficits for children and adolescents with ASD significantly predicts poor outcomes later in adulthood (Gillberg & Steffenburg, 1987; Henninger & Taylor, 2013; Lotter, 1974). Early intervention significantly predicted positive outcomes for cognitively able children with ASD as they enter young adulthood (Anderson, Liang, & Lord, 2014).

Overall, adaptive functioning skills appear to be more relevant to predicting positive outcomes for young adults than cognitive ability (Anderson, Liang, & Lord, 2014; Kanne et al., 2011; Perry, Flanagan, Geier, & Freeman, 2009). As many youths with ASD are currently entering young adulthood, greater evaluation is needed to gain a better understanding of the interaction of ability and intervention on the outcomes of young adults with ASD (Henninger & Taylor, 2013; Anderson, Liang, & Lord; 2014). People with ASD that live alone have near normal, or more advanced, adaptive functioning and cognitive ability (Cederland, Hagberb, Billstedt, Gillberg, & Gillberg, 2008; Hendricks & Wehman, 2016; Howlin, 2000). To prepare youths with ASD for successful independent living in adulthood, there must be a training plan that includes ongoing planning, ongoing supervision, and hands-on teaching of a myriad of skills such as safety, financial independence, and other daily living skills (Cederland, Hagberb, Billstedt, Gillberg, & Gillberg, 2008; Henninger & Taylor, 2013; Howlin, 2000; Smith & Phillippen, 1999; Wehman, 2006).

As adolescents with ASD transition into college, they must learn necessary skills and achieved a degree of independent living as responsibilities shift from the parents to the college student (Marriage, Wolverton, & Marriage, 2009; van Schalkwyk & Volkmar, 2017). Students with ASD must have enough adaptive functioning skills to independently navigate between daily activities such as doing laundry, shopping, and obtaining food (Thierfeld, Wold, King, & Bork, 2012; van Schalkwyk & Volkmar, 2017). Poor adaptive functioning skills is a significant barrier to independent functioning for students with ASD in postsecondary education (Shattuck et al., 2012). It is important for students with ASD to develop these capacities well before beginning their transition into independence in college (van Schalkwyk & Volkmar, 2015). Currently, the scope of potential opportunities has broadened and increasingly positive for youths with ASD as they transition into adulthood (van Schalkwyk & Volkmar, 2017; Vanbergeijk, Klin, & Volkmar, 2008).

Timing for intervention is crucial for teaching and developing independent living skills as children and adolescents with ASD transition into adulthood. A 10-year longitudinal study observed a positive trend for children and adolescents with ASD to gain or improve on various daily-living skills as they age (Smith, Maenner, & Seltzer, 2012). Timing is critical as this achievement was found to plateau at adult ages, such as the late 20s. This observed plateau was not due to mastery of daily living skills as ceiling effects were not observed. The acquired daily living skills included meal-related activities such as preparing sandwiches, mixing pancakes, using a microwave, preparing a complete meal, setting and clearing a table, and washing dishes. The observed plateau

in gaining daily living skills shows how crucial timing is to teach these meal-related independence skills to prepare adolescents with ASD for their transition into adulthood.

## Caregiver Stress for Adolescents with ASD

Teaching these daily living skills not only prepares youths with ASD for adult independence but can also reduce their caregivers' experience of stress. Caring for an individual with ASD may include managing persistent impairments in daily living skills, communication, social interaction, employment, and education as well as high costs for health services and providing continued support as they become adults (Ballaban-Gil, Rapin, Tuchman, & Shinnar, 1996; Barnard, Harvey, Potter, & Prior, 2001; Cadman et al., 2012; Howlin, Goode, Hutton, & Rutter, 2004; Knapp, Romeo, & Beecham, 2009; Levy & Perry, 2011). Caregivers of children with ASD often report a high level of stress and burden, higher than caregivers of children with other developmental disorders, such as, Down Syndrome, Attention-Deficit/Hyperactivity Disorder, and Fragile X Syndrome, as well as more stress than parents of typically developing children (Abbeduto et al., 2004; Blacher & McIntyre, 2006; Cadman et al. 2012; Dumas, Wolf, Fisman, & Culligan, 1991). A major stressor reported by mothers of children with ASD is the constant care and supervision they provide, which restricts other parts of their lives, such as leisure time and family outings (Meirsschaut, Roeyers, & Warreyn, 2010; Myers, Mackintosh, & Goin-Kochel, 2009). Myers, Mackintosh, and Goin-Kochel (2009) interviewed parents about how having a child with ASD affects their lives and their families' lives. Parents

reported restrictions on vacations, when visiting relatives, attending cultural events, school events, going to a grocery store, church, shopping, and eating at restaurants.

Very few studies have investigated the stress and burdens of caregivers with an adolescent or young adult with ASD. Cadman et al. (2012) investigated specific burdens contributing to stress experienced by caregivers of adolescents and young adults with ASD compared to adolescents and young adults with Attention-Deficit/Hyperactivity Disorder. They found caregivers of youths with ASD experienced a higher level of stress compared to parents of youths with Attention-Deficit/Hyperactivity Disorder. Among caregivers of youths with ASD, unmet needs such as social relationships, depression/anxiety, safety of self, and daily activities remained a significant predictor of burden on the caregiver and experience of caregiver stress.

## Eating Problems of Children and Adolescents with ASD

Parents of children with developmental disabilities report helping and supervising during mealtimes to be one of the most stressful parenting tasks (Plant & Sanders, 2007). Parents of children with ASD often describe mealtime with their child as difficult and stressful due to self-restricted diets, arguments about eating habits, not being able to feed oneself, having to cook an additional meal tailored to that child's preferences, and difficulty sitting at the table or a restaurant while eating (Franklin & Rodger, 2003; Hall & Graff, 2011; Mascola, Bryson, & Agras, 2010; Papageorgiou & Kalyva, 2010; Seiverling, Hendy, & Williams, 2011; Suarez, Atchison, & Lagerwey, 2014).

In addition to this stress, mothers are concerned for their child's health due to poor diet patterns and inadequate nutrition (Cadman et al., 2012; Matson & Fodstad, 2009).

Eating and feeding problems in ASD were recognized early in ASD history by Leo Kanner (1943) who noted these issues in 6 of 11 children. Recent studies continue to show a higher prevalence for eating problems in children from preschool age to 11 years old with ASD, compared to their typically developing peers (Bandini et al., 2010; Dominick, Davis, Lainhart, Tager-Flusberg, & Folstein, 2007; Ledford & Gast, 2006; Martins, Young, & Robson, 2008; Schreck & Williams, 2006; Schreck, Williams, & Smith, 2004). Few studies have investigated eating problems in adolescents with ASD. Those that have investigated adolescent eating problems found adolescents and young adults with ASD had similar eating problems of children with ASD, including narrow food preferences, preferences for familiar foods (food neophobia), and rigid food preferences such as the brand, texture, taste, and presentation of the food (American Psychiatric Association, 2013; Kuschner, Eisenberg, Orionzi, Simmons, Kenworthy, Martin, & Wallace, 2009; Rogers, Magill-Evans, & Rempel, 2012; Suarez, Atchison, & Lagerwey, 2014). Kuschner et al. (2015) investigated self-reported food selectivity in adolescents and young adults with ASD. Adolescents and young adults reported disliking textured food and strong flavors, "such as applesauce, cottage cheese, or chunky peanut butter". This food selectivity is not only stressful for caregivers, but could also lead to inadequate nutrition for youths with ASD (Cadman et al., 2012; Matson & Fodstad, 2009).

Feeding interventions for food selectively for individuals with ASD are usually geared towards children and typically take place in a hospital or clinical setting (Addison

et al., 2012; Ledford & Gast, 2006; Matson & Fodstad, 2009; Peterson, Piazza, & Volkert, 2016). These interventions focus on addressing sensory sensitivities and severe behavior issues associated with refusing to eat specific foods (Addison et al., 2012; Ledford & Gast, 2006; Matson & Fodstad, 2009; Peterson, Piazza, & Volkert, 2016). These methods are effective, but are not appropriate for youths with ASD who do not have severe eating problems. To address parent concerns for the health and dietary behavior of their adolescent with ASD, interventions with nutrition and cooking education components are more appropriate.

## Dietary Behavior of Adolescents

Improving dietary behavior by encouraging adequate consumption of fruits and vegetables is important for children and adolescents to reduce their risk of developing nutrition-related problems such as cardiovascular issues, obesity, hypertension, and type 2 diabetes (Lytle, 2002; Ness et al., 2005; Van Duyn & Pivonka, 2000). Over the last few decades, adolescents consumed more fat, sugar and salt than the national recommendations of the United States Department of Agriculture (Cavadini, Siega-Riz, & Popkin, 2000; Levine & Guthrie, 1997; Munoz, Krebs-Smith, Ballard-Barbash, R., & Cleveland, 1997). Cavadini, Siega-Riz, and Popkin investigated adolescent food consumption trends in the United States from 1965 to 1996 and found they increasingly consumed mixed dishes, such as pizza and macaroni-and-cheese. There was a decrease in high-fat milk consumption. However, this trend was not just accompanied with more low-fat milk consumption, but also soft-drinks and juices. Adolescents have been found

to consume less fruits, vegetables, whole grains, calcium foods, dietary fiber, and iron compared to the national recommendations (Cavadini, Siega-Riz, & Popkin, 2000; Levine & Guthrie, 1997; Munoz, Krebs-Smith, Ballard-Barbash, & Cleveland, 1997). Cavadini, Seiga-Riz, and Popkin also found adolescents increasingly consumed vegetables over the years, but this trend was largely due to increased consumption of high-fat potatoes and this observed increase remained below the national recommendations. To address these alarming dietary trends, nutrition education for adolescents is not only important to prevent nutrition-related problems in their future, but a timely influence as adolescents begin to navigate their choices, responsibilities, and independence in adolescence and adulthood (Hoelscher, Evans, Parcel, & Kelder, 2002).

## Strategies of Cooking and Nutrition Programs

Effective nutrition-based strategies for children and adolescents focused on theories for changing behavior incorporated multiple components, included continuous participation and used developmentally appropriate strategies (Blanchette & Brug, 2005; Hoelscher, Evans, Parcel, & Kelder, 2002; Roseman, Riddell, & Haynes, 2011; Wang et al., 2010). Interventions that included a singular focus to improve the knowledge about nutrition effectively increased knowledge in children and adolescents, but did not improve their dietary behavior (Hoelscher, Evans, Parcel, & Kelder, 2002). Social Cognitive Theory integrates a focus on behavior, personal factors, and the environment which is expected to contribute to positive behavior change in health promotion programs (Bandura, 1998; Hoelscher et al., 2002). An important factor in this

model when determining adolescent dietary behavior are influences in the environment, specifically the influence of the environment on behavior and perceived self-efficacy to act (Bandura, 1998; Hoelscher et al., 2002). As children and adolescents are not completely responsible for creating their own environment, implementing a program that will create an environment with more access to healthy food choices is expected to allow them the chance to act on their intended dietary behavior. Another theory for dietary behavior change is the Knowledge, Attitudes, Behavior model (Lytle, 2002). This model has been applied to many nutrition programs geared towards young children and has found increased nutrition knowledge (Kehr, Nelson, & McCaffrey, 2015; Lytle, 2002). Although knowledge was measured to correlate with more positive attitudes towards healthy food, actual healthy dietary behavior was not consistently observed to change across studies (Hoelscher et al., 2002; Kehr, Nelson, & McCaffrey, 2015; Lytle, 2002). Hoelscher et al. stresses the importance of nutrition programs to focus on influencing behavior change and to incorporate multiple intervention components to develop more healthful dietary behavior among adolescents.

Multi-component nutrition programs that incorporate nutrition education, peer involvement, parent involvement, physical activity, accessibility to healthy food choices in the environment, gardening and/or cooking education have shown great promise for increasing fruit and vegetable consumption in children and adolescents (Blanchette & Brug, 2005; Hoelscher et al., 2002; Faith, Scanlon, Birch, Francis, & Sherry, 2004; Horne et al., 2004; Jarpe-Ratner, Folkens, Sharma, Daro, & Edens, 2016; Lowe, Horne, Tapper, Bowdery, & Egerton, 2004; Roseman, Riddell, & Haynes, 2011; Wang et al., 2010;

Wardle et al., 2003). Wang et al. (2010) implemented a 3-year school intervention with 4th and 5th graders to increase vegetable consumption. They incorporated components that allowed for exposure and experiential learning with nutrition, gardening and cooking. Adolescents with a high amount of participation in the intervention consumed more vegetables during school lunches and at home, compared to adolescents who had a low amount of participation in the intervention. Many studies have found the incorporation of a cooking component in a nutrition program to not only increase knowledge and attitudes about healthy dietary behavior, but also increased confidence in cooking, perceived self-efficacy to cook meals, fruit and vegetable consumption, and communication with family members about healthy eating (Archuleta et al., 2012; Caraher, Seeley, Wu, & Lloyd, 2013; Chu et al., 2013; Hartmann, Dohle, & Siegrist, 2013; Jarpe-Ratner, Folkens, Sharma, Daro, & Edens, 2016; Wang et al., 2010). Bukhari, Fredericks, and Wylie-Rosett (2011) trained high school teachers to implement an experiential learning program that incorporated gardening, cooking, and enjoying meals with friends and family to promote healthy dietary behavior among adolescents. The program curriculum was based on Social Cognitive Theory to focus on the interaction of behavior with personal factors and one's environment (Bandura, 1998; Bukhari et al., 2011). For 19 weeks of Bukhari et al.'s program, adolescents received nutrition lessons, participated in healthy living activities, developed skills in gardening, preparing snacks, planning and cooking a meal. After participating in the 19-week experiential program, adolescents improved their dietary behavior on a 15-item food list that included fruit juice, hot dog, fried chicken, green leafy vegetables milk, green salad, carrots, etc. There

was an observed increase in eating more vegetables as snacks and preparing healthy snacks for self. Qualitative data analysis showed an improved knowledge and attitudes about healthful eating. The success of this curriculum has led to 85 schools across 16 states to adopt the curriculum as an elective course or an after-school program. This program has been enhanced to encourage peer-modeling by having more experienced students assist their peers with cooking and nutrition lessons.

There are few interventions that focus on developing independent cooking skills and improving dietary behavior of adolescents with ASD. Some interventions for improving daily living skills reported success in teaching children and adolescents with ASD basic meal preparation skills such as packing a lunch, setting a table, and getting a drink (Cannella-Malone et al., 2006; Pierce & Schreibman, 1994; Shipley-Benamou, Lutzker, & Taubman, 2002; Van Laarhoven, Kraus, Karpman, Nizzi, & Valentino, 2010). Some interventions have focused on the development of more complex meal-preparation skills for young adults with ASD (Goldschmidt & Song, 2017; Graves, Collins, Schuster, & Kleinert, 2005; Mechling, Ayres, Foster, & Bryant, 2013; Mechling & Gustafson, 2008; Mechling & Stephens, 2009; Sigafoos et al., 2005). These studies taught meal preparation and cooking skills to adolescents and adults with ASD or other developmental disabilities. The meal-related activities ranged from making hot chocolate, microwaving popcorn, preparing a salad or sandwich, baking frozen fries, to cooking chicken or noodles on a stove. These studies consistently found video modelling and prompting to be successful strategies in meal preparation and cooking skills interventions. Specifically, these videos were recorded from a subjective view as to

appear from the student's own view. Pauses were inserted throughout the video with verbal prompts on the video or an instructor standing with the participant to complete specific tasks during the pause. Cooking videos with prompts were more effective for teaching cooking skills to adolescents with ASD compared to using cookbook pictures or commercially available recipe videos geared towards a public audience (Mechling, Ayres, Foster, & Bryant, 2013; Mechling & Gustafson, 2008). Graves, Collins, Schuster, and Kleinert (2005) taught various simple and complex meal preparation and cooking skills to three adolescents with moderate disabilities. They found video prompting to successfully teach the adolescents how to prepare a sandwich, microwave macaroni, and cook Ramen noodles on a stove. Graves et al. reported the need to combine the intervention with other nontargeted information while the adolescents were waiting for food to cook. They also reported minor problems of having to rewind and replay certain video clips or to pause and allow the adolescent to have more time between tasks.

Goldschmidt and Song (2017) developed a nutrition intervention that focused on developing independent cooking skills for adults with ASD and other developmental disabilities. Goldschmidt and Song modified a conceptual framework developed by Hodge, Danish, and Martin (2013), known as the Life Development Intervention and Basic Needs Theory Life Skills Model, to their own nutrition intervention. In the original model, Hodge et al. hypothesized that providing a motivational climate through a life skills intervention will support the individual to satisfy three needs: autonomy, competence, and relatedness. This will allow for optimal outcomes and generalization of behavior outside the intervention setting. Goldschmidt and Song modified this model to

their nutrition intervention which created a motivation climate to support autonomy by integrating independent meal planning and choice making, supporting competence by skill development in meal preparation and cooking, and supporting relatedness by social engagement with peers. In addition to the three needs, they added a fourth preference need that will be supported by developing a repertoire of taste preferences through the intervention. The progression through Goldschmidt and Song's nutrition intervention may progress through five stages: 1) learning to chip, cut, peel, and grate vegetables for a salad, 2) being introduced to small cooking appliances, 3) being introduced to large cooking appliances, 4) choosing an elective course from baking, ethnic cuisine, preparing family meals, or bread making, and 5) applying the skills into the home/residential environment. Progress through the intervention was attuned to the abilities and preferences of each individual participant. Due to the heterogeneity of the sample and intervention progression, group reports were not made. They reported gains were made in the four needs across participants (autonomy, competence, relatedness, and preference), but gains were not similar for each individual participant. For example, some individuals did not achieve the competency need in making a salad, but they did achieve the preference need by accepting various vegetables from the salad into their diet. They note rigorous qualitative analysis is needed to capture changes in behavior in similar nutrition programs. To this researcher's knowledge, no program has implemented a cooking program that incorporates components of nutrition education, cooking skills, and social skills with a group of adolescents with ASD.

## The Current Study

Caregivers of adolescents with ASD frequently reported concerns for their child's independent functioning and health (Cadman et al., 2012; Matson & Fodstad, 2009). Adolescence is the time to begin teaching independence cooking skills and promoting healthy dietary behavior to youths with ASD (Smith, Maenner, & Seltzer, 2012). As cooking can be complex and require a wide array of skills, adolescents with ASD and near normal adaptive functioning skills can begin to learn how to cook as they begin to navigate their choices, responsibilities, and independence as an adult. The purpose of the current study was to investigate the effect of a multi-component cooking program on the dietary behavior, mealtime social skills, and adaptive functioning of adolescents with ASD and their primary caregiver's experience of caregiver stress, known as the Cooking Healthy and Eating with Friends (CHEF) cooking program.

Modeled after Goldschmidt and Song's (2017) conceptual framework and recognizing the importance of multiple component interventions, peer modeling, parent involvement, and environmental influences (Bandura, 1998; Faith, Scanlon, Birch, Francis, & Sherry, 2004; Hoelscher, Evans, Parcel, & Kelder, 2002; Horne et al., 2004), the CHEF program incorporated nutrition education, cooking skills development, mealtime social skills development, peer engagement, and parent involvement. The conceptual framework of the CHEF program creates a motivational climate to satisfy five needs for optimal outcomes: autonomy, competence, relatedness, preference, and environment (see Figure 1). The CHEF program supports autonomy by having the adolescent choose a meal to cook, supports competence by developing cooking skills

over repeated cooking sessions, supports relatedness by creating an environment to promote social engagement with peers on meal-related activities, supports preference by exposing adolescents to healthy food groups to develop healthy dietary behavior, supports environment by influencing caregivers to provide their adolescent with access to health food choices. Supporting the achievement of these 5 needs is expected to lead to development and generalization of optimal program outcomes.

The first aim of the current study investigated the effects of the CHEF program on the behavior and skills of adolescents with ASD. Adolescents with ASD who participated in the program are expected to have an expanded diet with more fruits and vegetables, improved adaptive functioning skills, and improved social skills.

The second aim of the study investigated the effects of the CHEF program on primary caregivers of adolescents with ASD. Primary caregivers are expected to increase their adolescents' access to healthy food choices, and, experience a reduction in caregiver stress after their adolescent completed the program.

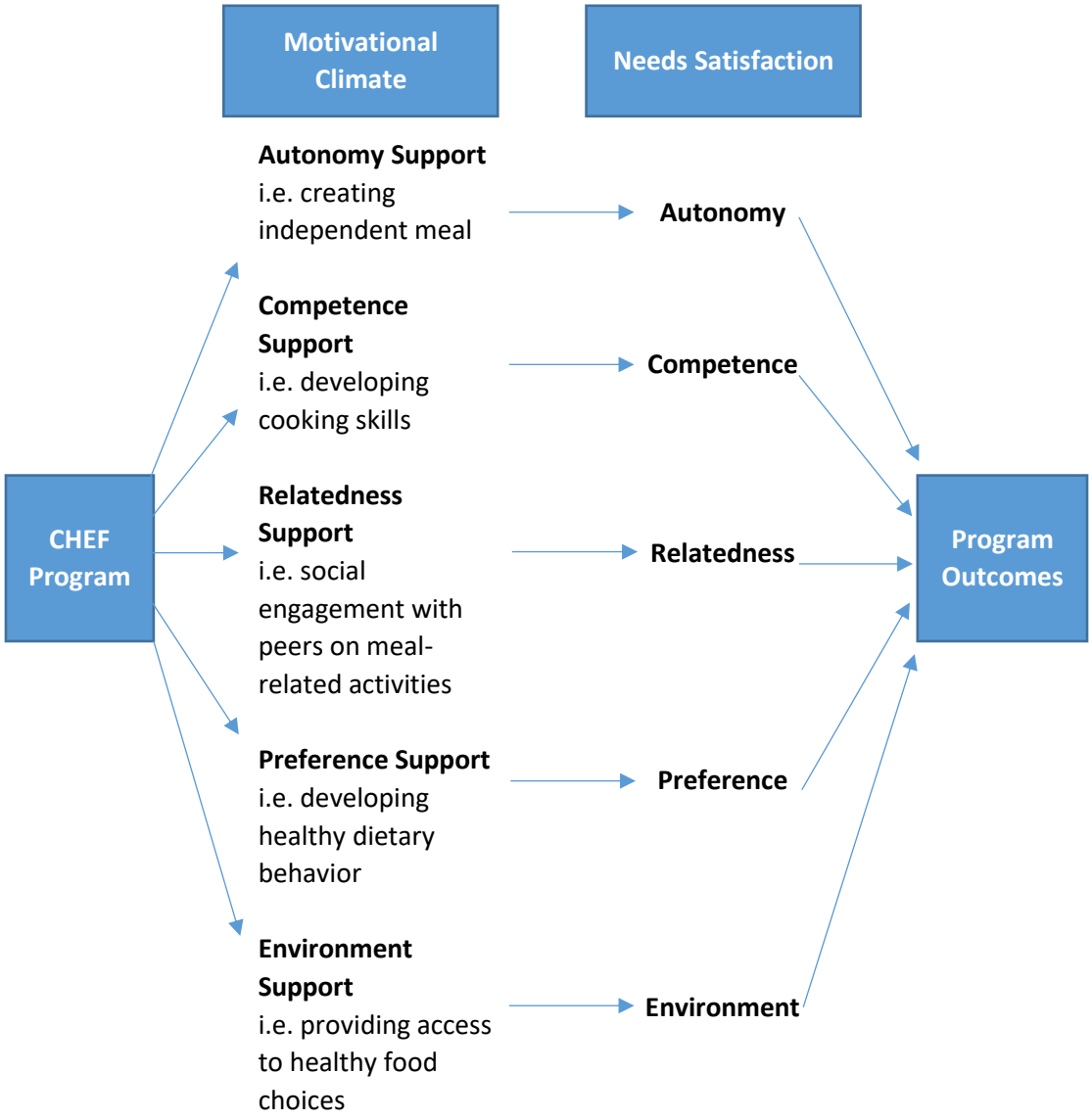



Figure 1. Conceptual Framework of the CHEF Program for Adolescents with ASD

# METHODS

## Participants

Adolescents with ASD and their parents were recruited to participate in the current pilot study through purposive sampling at a local center for children and adolescents with ASD. Recruitment procedures included adolescents who were enrolled in the center's after-school social and academic program, which was where the CHEF program was implemented. Recruitment methods included distribution of flyers and in-person communication with families who were attending the center's orientation. Primary caregivers with an adolescent with ASD attending the local center were recruited to participate in the current study *(n = 7, Age range = 39 to 46 years old)*. Adolescent participants who completed the entire study all had an ASD diagnosis *(n = 7, Age range = 12 to 14 years old*). Two were female and five were male. Adolescents in the current study did not have any food allergies. Four out of five adolescent participants were identified as a picky-eater defined by refusing to eat many foods offered in the family home. One participant had food restrictions to avoid eating red dye and another was vegetarian. None of the participants were reported to ever receive services feeding intervention services. Three adolescent participants were taking medications for Attention-Deficit/Hyperactivity Disorder, two for Anxiety Disorder, and one for acid reflux. Adolescent participants weighed 98-150 pounds. Teachers who

implemented the program were recruited for follow-up interviews in the current study (*n* = 2).

Table 1

*Participant Information*

| Variable | N | Range | Mean ± SD |
|---|---|---|---|
| Parent Age (years) | 7 | 39-46 | 42.3 ± 2.69 |
| Adolescent Age (years) | 7 | 12-14 | 12.9 ± 0.90 |
| Adolescent Adaptive Functioning Composite | 7 | 68-89 | 74.1 ± 7.08 |

Note. Adaptive Functioning is reported by the General Adaptive Composite Score from the Adaptive Behavior Assessment System-3.

## CHEF Cooking Program Curriculum

The principal investigator developed the CHEF program using inspirations and materials from a children's cookbook by Deanna Cook (2015) and the www.choosemyplate.gov website. The program included two-hour sessions held once a week for 9 weeks. This program was held on a Monday afternoon, after adolescents have completed their day at school. The principal investigator and two teachers from the community center implemented the entire program. One teacher received a bachelor's degree in education and another is a certified assistant behavior analyst. Teachers were provided with program instructions prior to beginning the program, the cooking schedule one week after program implementation, and specific meal instructions one-week prior to each session. All program materials and curriculum manual can be found in Appendix B. In the first session, adolescents were introduced to the activities of the program, exposed to basic nutrition information, taught kitchen

safety information, practiced hand-washing, and participated in a discussion with their peers about the food pyramid, food preferences, and cooking experience. At the end of the first session, adolescents were asked to create a meal they would like to learn how to cook. When needed, the principal investigator and program teachers guided the adolescent through creating a meal to cook. One rule for creating the meal was that it must include at least 3 out of 5 food groups. Dairy was purposely ruled out as a choice by providing milk with each meal. This encouraged the adolescents to pick three food groups from fruits, vegetables, proteins, and grains, which allowed for at least a fruit or vegetable to be in each meal.

Each session after the first was a cooking session where adolescents acted as the "head chef" to cook their meal. The principal investigator and program teachers provided assistance when needed. Each head chef chose a few "sous chefs", their peers in the program, to assist in cooking the meal. Adolescents were reminded of kitchen safety and cleanliness rules at each session. Appliances and measurements used for each recipe were taught to the group before beginning the preparations and cooking.

When adolescents were not the head chef or assisting their peers as sous chefs, they participated in learning about what the head and sous chefs were cooking/preparing and engaged in discussion about healthy food choices (refer to Table-Top Discussion Card Topics in the curriculum manual). When all participants were waiting for food to finish cooking in each session, teachers shared lessons and instructed participant discussions about nutrition, physical activity, grocery shopping, cooking at home, eating at school, setting a table, loading a dishwasher, how to host a meal with

guests, and manners when eating at other people's homes or at a restaurant. Adolescent participants were taken to the play rooms to engage in physical activity in 7 out of 9 sessions. Physical activity were one of the non-targeted lessons taught to adolescents while they were waiting for food to finish cooking.

At the end of each session, the head chef served the food and enjoyed the meal with their peers. While they ate the food, they practiced their mealtime social skills and were encouraged to carry conversations with each other. Teachers intervened when inappropriate behavior, inappropriate manners, or facilitation was needed during discussion.

The last session of the program included a group preparation and cooking activity to make pasta. The program concluded by allowing the adolescents to enjoy the meal together and reflect on the knowledge and skills learned.

Meals prepared in this pilot study included pancakes and eggs, baked pizza, California sushi rolls, baked popcorn chicken, a taco casserole, baked fish and rice, cheese quesadillas, and spaghetti with meatballs. More fruits than vegetables were chosen to be added to meals as a side dish. These included bananas, strawberries, and oranges. Some meals had cucumber or avocado in the recipe. Corn and green peas were chosen by the adolescents as side dishes for other meals. Recipes from the pilot study can be found in the program manual.

## Program Setting

All cooking sessions were conducted in the community center's staff kitchen. The kitchen area had a small round table and chairs used for food preparation and sometimes to eat at the end of the session, two refrigerators, a stove oven, counter top space, sink, a dishwasher, and two microwaves. Cooking equipment were usually made available on the kitchen counter for each session. Adolescents were instructed to retrieve easily reached cooking equipment from drawers (spatula, measuring cups, silverware) and food items from the refrigerator or counter top when necessary. Other center areas utilized by the program were the small conference room to eat in during some sessions, indoor play room, and outdoor play area. The conference room was down the hall and included a medium table with 10-12 chairs.

## Analytical Model and Procedure

The current study used an explanatory sequential mixed method design to analyze the effect of piloting the CHEF cooking program with a group of adolescents with ASD (see Figure 2). This analytical model included two phases and has proven to be informative when quantitative (phase 1) and qualitative (phase 2) data are sufficiently integrated for interpretation (Ivankova, Creswell, & Stick, 2006). The rationale for using this analytical model was to use qualitative techniques to explain the findings from the quantitative phase of the study. Preliminary results from phase 1 informed the direction for phase 2. Results in phase 2 provided valuable information to the results in phase 1 as there are no valid standardized measures to quantify changes in social skills specific to

eating and mealtime. Qualitative data provided a better understanding for the effects of the cooking program on the adolescent's and their caregiver's experience of stress. Lastly, using this mixed methods design is a strength of the study and balances out the weaknesses from the quantitative phase. The last step in the analytical model included integrating data from both phases to achieve an in-depth understanding of the effects of the program.

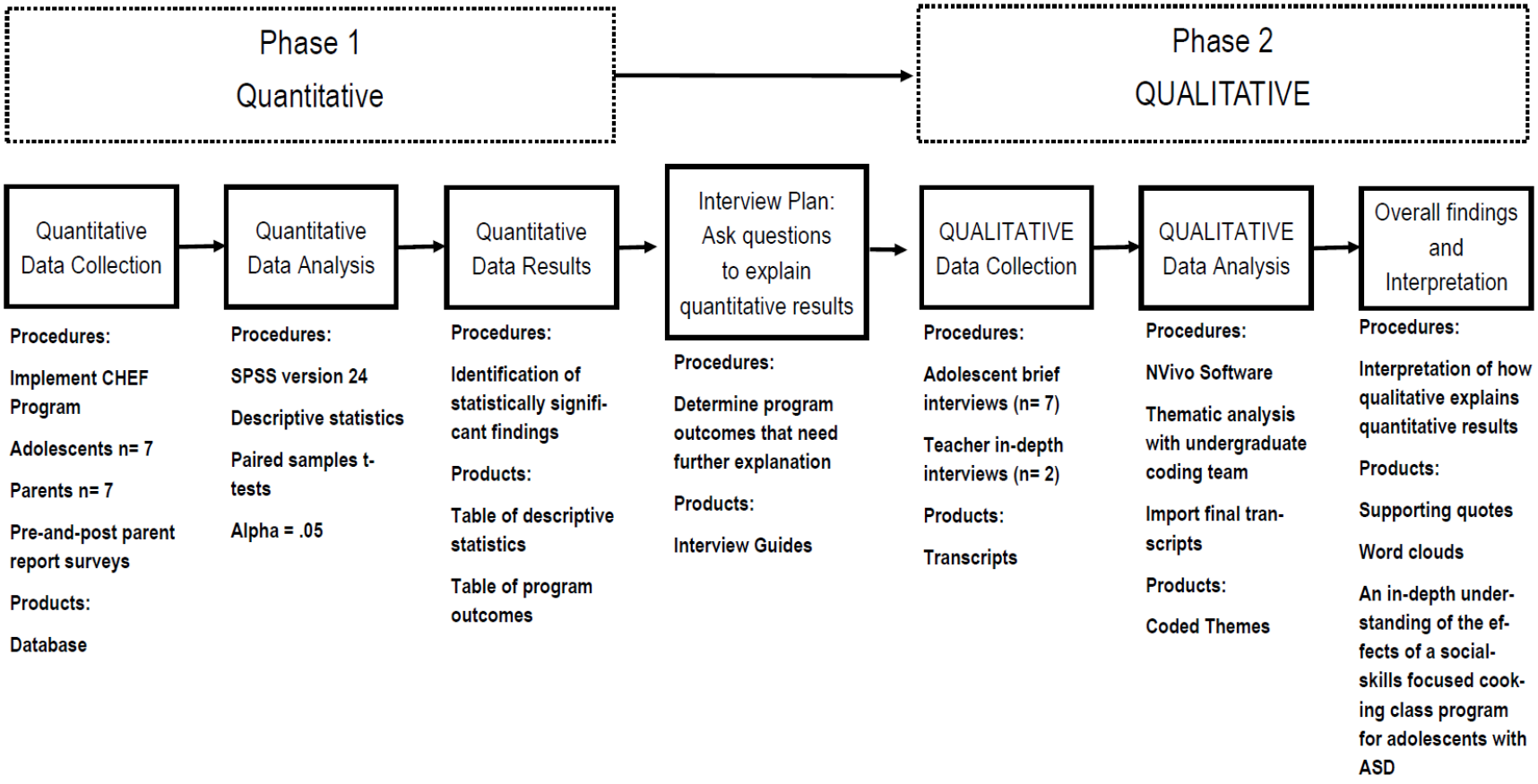



Figure 2. Explanatory Sequential Mixed Methods Analytical Design for the CHEF Program

Research approval from the Institutional Review Board (Protocol Number X150813001; see Appendix A) was obtained prior to the implementation of the study. Informed consent was received from primary caregivers and informed assent was obtained from adolescent participants.

*Quantitative Analysis*

During the first phase of the study, the CHEF program was implemented with the adolescent participants. Primary caregivers were given quantitative parent-report surveys at the beginning and end of the program to determine if they experienced a reduction in caregiver stress after their adolescent completed the program, if they provided more access to healthy food choices for their adolescent, and whether their adolescent's social skills, adaptive functioning, and dietary behavior improved after completing the program. The following quantitative measures are valid parent-report measures and have been collected from samples of parents with children and adolescents with ASD.

Primary caregivers completed an ***information form*** about their child's age, food restrictions, weight, height, other diagnoses, if they considered their adolescent a picky-eater defined as refusing to eat many foods the family typically ate, if their adolescent ever received any feeding interventions, how often they cook a meal at home, how often they go out to eat with their adolescent, and how much their adolescent engages in physical activity.

***Dietary and eating behavior*** of the adolescents were measured by a food preference inventory that listed over 70 food items across the 5 food groups (fruit, vegetables, proteins, grains, and dairy) including beverages. There is no standard measure for this inventory of food items. However, this type of dietary behavior measure is a common feeding tool used by registered dietitians, nutritionists, and feeding intervention therapists to get a list of what the adolescent eats or refuses to eat. Inventory items included “Bananas”, “American Cheese”, “Carrots”, “Noodles”, and “Bacon”. The Brief Autism Mealtime Behavior Inventory (Lukens & Linscheid, 2008) was used to measure problem behavior at mealtime. This measure has 18-items and asked parents to report their child’s mealtime problem behavior on a scale rating from “Never/Rarely” to “At Almost Every Meal”. Survey questions included “My child remains seated at the table until the meal is finished”, “My child is disruptive during mealtimes (pushing/throwing utensils, food”, “My child is willing to try new foods”, “My child is inflexible about mealtime routines (times for meals, seating arrangements, place settings)”, and “My child prefers food prepared in a particular way (eats mostly fried foods, cold cereals, raw vegetables)””. This measure yields an overall mealtime problem behavior frequency score calculated through summing all items and has a .88 reliability. A higher frequency score indicates more adolescent mealtime problems reported by the parent.

***Social skills*** of adolescents with ASD were measured using parent-report on the Social Responsiveness Scale-2 (SRS-2) school-age form (Constantino & Gruber, 2012). This measure asked parents to rate the severity of their adolescent’s interpersonal

behavior, communication, and repetitive or stereotyped behaviors on 65-items (rating from “not true” to “almost always true”). Survey questions included “Is aware of what others are thinking or feeling”, “Plays appropriately with children his or her age”, and “Has difficulty relating to peers”. This measure is highly valid for discriminating between adolescents with and without ASD. The SRS-2 provides a total score and five subscale scores: social awareness, social cognition, social communication, social motivation, and autistic mannerisms. Higher scores indicate greater severity in behavior: a score of 76 or higher indicates clinically significant severe deficits, 66 indicates clinically significant moderate deficits, 60 indicates mild to moderate deficits, and any scores of 59 or below indicates behavior within normal limits.

***Adaptive functioning*** of the adolescents was measured using parent-report on the Adaptive Behavior Assessment Scale-3 parent form for ages 5-21 years (Harrison & Oakland, 2015). This measure asked parents to rate their adolescent’s ability to engage in daily living skills. Survey questions included “Before buying an item in a store, gives careful thought to the need for it and its cost”, “Reads menus at restaurants”, and “Shows caution around hot or dangerous items”. This measure yields a general adaptive composite (GAC), 3 composite scores (conceptual, social, and practical), and scores on several subscales (specific skill areas: communication, community use, functional academics, health and safety, home living, leisure, self-care, self-direction, social, work, and motor). Survey questions of interest to the current study from the Home Living subscale includes “Clears the table completely after a meal”, “Makes simple meals that require no cooking (for example, sandwiches or salads)”, “Uses small electrical

appliances (can opener, blender)", and "Mixes and cooks fairly complex foods using a stove or oven (cake or brownies)". Survey questions of interest to the current study from the Health and Safety subscale includes "Shows caution around hot or dangerous items", "Tests hot foods before eating them", "Follows general safety rules at home", and "Uses tools and equipment safely". This measure is valid for evaluating adaptive skills for children and adolescents with ASD. For ages 13-14 years, the three composite scores on the parent form range from .96 to .97 reliability. Scores indicate adaptive functioning from extremely low to high, where lower scores indicate poorer adaptive functioning. Scores below an 8 in the skills areas, below a 25 in overall scores, or below a 90 for the GAC score indicates below average functioning.

***Parenting stress*** was measured using self-report by primary caregivers on the Parenting Stress Index-4 (Abidin, 2012). The child domain subscale was used to determine the level of parenting stress within the parent-child relationship, which included 47 items. Survey questions included "When I do things for my child, I get the feeling that my efforts are not appreciated very much", "In some areas, my child seems to have forgotten past learnings and has gone back to doing things characteristic of younger children", "My child's sleeping or eating schedule was much harder to establish than I expected", "My child has more health problems than I expected", and "As my child has grown older and become more independent, I find myself more worried that my child will get hurt or into trouble". The child domain includes 6 subscales: Distractibility/Hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood, and Acceptability of the child's characteristics. This subscale has been validated for

parents of at-risk children between ages 0 to 12 years-old with .78 to .88 alpha reliability coefficients, and .55 to .82 test-retest reliability coefficients. As adolescents in the current study's age ranged from 12-14 years-old, the percentiles and t-scores were converted using the most relevant normative scale, which was the 12-year old scale. Percentile scores in the 85$^{th}$-89$^{th}$ percentile is in the high range and may indicate difficult experiences. Percentile scores in the 90$^{th}$ percentile or higher are in the clinically significant range.

***Parent feeding practices*** were measured using self-report on the Parent Mealtime Action Scale (Hendy, Williams, Camise, Eckman, & Hedemann, 2009), which is a 31-item self-report measure by parents about their feeding practices for their children. Parents were asked to rate how often they showed that mealtime action within each dimension (rating from "never" to "always"). This measure yields average scores about feeding styles on several dimensions (many food choices, special meals, snack limits, positive persuasion, daily fruit and vegetable availability, use of rewards, insistence on eating, snack modeling, and fat reduction). Items in the Daily Fruit and Vegetable Ability dimension included "You gave the child fruit each day", "You ate fruit each day", and "You ate vegetables each day". Items in the Snack Limits dimension included "You set limits for how many sweets the child could have each day", "You set limits for how many sodas the child could have each day", and "You set limits for how many salty snacks the child could have each day". Items in the Snack Modeling dimension included "You drank soda each day", "You ate candy or sweets each day", and "You ate salty snacks each day". Items in the Many Food Choices dimension

included “You let the child eat whatever he/she wanted”, “You let the child flavor the food however he/she wanted”, “You let the child substitute a food for one he/she liked”, and “You let the child choose which foods to eat, but only from those offered”. The measure has a .62 average reliability for all dimensions. Higher scores indicated use of that feeding style more often.

*Qualitative Analysis*

During the second phase of the study, adolescents who participated in the program and teachers who implemented the program participated in post-intervention interviews. An information sheet and verbal agreement of participation were approved as consent per the Institutional Review Board for teacher participants. Primary caregivers were not recruited for data collection in phase 2 due to the center’s concern for potential discomfort caused by potentially invasive and time-consuming in-depth interviews.

The second phase of the study administered one-on-one interviews with participants, which is a commonly used qualitative data collection strategy to explore the views, experiences, and motivations of individuals (Gill, Stewart, Treasure, & Chadwick, 2008). Brief interviews with adolescent participants of the program were completed to gain a self-reported account of their acceptability of the program, knowledge gained, and eating preferences (see Appendix D). In-depth interviews were completed with teachers who assisted in implementation of the program (see Appendix F) to understand how adolescents’ behaviors and skills changed after the program.

Interview sessions were conducted in a private classroom at the community center and voice recorded on a phone application. Voice recordings were manually transcribed into word documents then deleted from the phone application after transcription and data back-up. All identifying information, such as names, were replaced with “XXX”.

Three undergraduate students were recruited to be on a qualitative coding team. Coders used thematic analysis to code themes and patterns within the transcripts. Thematic analysis is one of the most common forms of qualitative data analysis methods and has shown to be very useful across studies (Braun & Clarke, 2006). An inductive approach was used in thematic analysis as coders were provided very little information on the study. Undergraduate coders were briefly introduced to the study being informed that adolescents with ASD participated in a cooking program where eating preferences and adaptive functioning skills were analyzed. This approach allowed for patterns to emerge from the data itself. Each coder participated in a training session with each other using a mock interview transcript as practice. This mock interview transcript was fabricated on relevant topics of eating preferences of adolescents. After agreement on understanding, coders were provided with their own copy of the de-identified adolescent and teacher transcripts. Coders met for a few hours over 5 sessions. Coders independently identified themes and patterns in the transcripts by writing their codes directly on the transcripts, line-by-line. Coders then openly convened on codes after each brief interview or 5 pages with the principal investigator. When different codes were given for the same quotes, coders were facilitated through a discussion until a consensus was made. Codes were expanded or refined as needed. Re-

visiting previous codes or re-coding previous quotes were conducted as needed. As codes were created, deleted, or modified, the principal investigator wrote the codes and definitions onto large sticky pad paper posted around the wall of the coding room. Once each session was over, coders returned the transcripts to the principal investigator. After the final coding session, the principal investigator has a completed key copy of the final coded and convened transcripts, which was entered into the NVivo Qualitative Data Analysis Software (Version 11, QSR International Pty Ltd., 2015) for qualitative organization and analysis.

# RESULTS

The principal investigator and the two center teachers successfully implemented the CHEF cooking program in 9 weekly sessions from February to April. Quantitative data from the first phase were entered and saved using the Statistical Package for the Social Sciences Software (SPSS, Version 24, IBM Corp., 2016). All quantitative data in phase 1 were compared pre-to-post intervention using paired samples t-tests. For phase 2 of the study, brief interviews with adolescent participants and in-depth interviews with program teachers were successfully completed, transcribed, and coded. Relevant information from the qualitative phase was successfully integrated with the quantitative results to depth of meaning to quantitative data interpretation.

## *Behavior and Skill Effects of the CHEF Program for Adolescents with ASD*

The first aim of the current study investigated the effects of the CHEF program on the behavior and skills of adolescents with ASD. Adolescents with ASD who participated in the program were expected to have an expanded diet with more fruits and vegetables, improved adaptive functioning skills, and improved social skills.

***Dietary behavior*** *of the adolescents* showed statistically significant increases in the number of foods accepted, $t(6) = 2.52$, $p < .05$, and of fruits, $t(6) = 2.49$, $p < .05$, and vegetables into their diet, $t(6) = 2.48$, $p < .05$ (see Table 2 and Figure 3). Dietary behavior change was not observed for proteins, grains, or dairy accepted into the adolescents'

diet (all *p-values* > .05). However, an increase in accepted protein foods approached significance at $p < .06$. Analyzing trends on an individual participant basis, bar graphs show that a few participants drastically increased their reported amount of accepted grains and protein in their diet, while the other participants consumption of these food groups remained similar.

Although a decreasing trend is observed, the frequency of behavior problems at mealtime for adolescents did not significantly decrease after program completion ($p > .05$). There were no significant changes in assisting family to cook meals nor amount of physical activity per week (all *p-values* > .05). There was a statistically significant increase in the amount of independent cooking adolescents were reported to engage, as reported by their primary caregiver, $t(6) = 3.87$, $p < .05$.

Table 2

*Adolescent Dietary and Eating Behavior*

| Variable | Pre Mean ± SD | Post Mean ± SD | t-test |
|---|---|---|---|
| Independent Cooking | 0.17 ± 0.41 | 1.17 ± 0.75 | 3.87* |
| Assist Family in Cooking Meals | 0.29 ± 0.49 | 0.43 ± 0.79 | 0.35 |
| Physical Activity | 4.71 ± 1.60 | 4.86 ± 2.27 | 0.28 |
| Total Foods Accepted | 65.4 ± 24.7 | 81.7 ± 18.5 | 2.52* |
| Vegetables | 13.9 ± 8.39 | 18.7 ± 6.45 | 2.48* |
| Fruits | 14.1 ± 6.52 | 16.4 ± 5.29 | 2.49* |
| Proteins | 15.1 ± 7.97 | 18.3 ± 8.30 | 2.39 |
| Grains | 15.3 ± 6.05 | 20.3 ± 6.78 | 2.02 |
| Dairy | 7.00 ±2.16 | 8.00 ± 1.41 | 2.05 |
| Mealtime Problem Behavior | 31.4 ± 7.00 | 28.4 ± 8.87 | -0.91 |

*$p < .05$, **$p < .01$

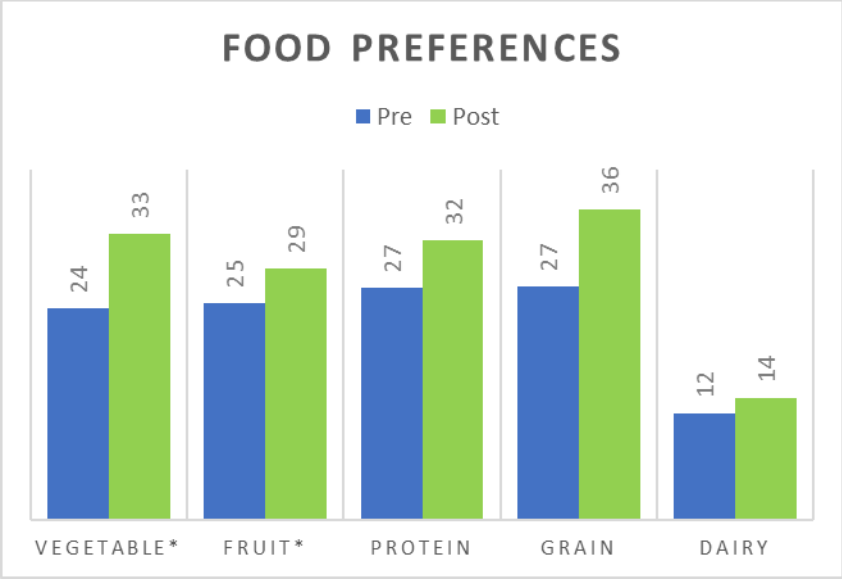



Figure 3. Adolescent Food Preferences

Qualitative findings with adolescent participants revealed that many of them like to eat fruits and vegetables. Some preferred certain vegetables with ranch dressing or butter. Adolescents typically referred to the taste of food as the reason they liked or did not like it. When describing what they liked about fruit, they mentioned *"they're delicious", "they're tasty", and "I am more of a fruit person. I like things that are refreshing.",* and that the presentation of strawberries sometimes *"look deformed, but they still taste the same. With potatoes, some of them look bad or a weird shape. I don't really care about how it looks. I just care about how it taste."* A query for the most frequent words used when describing fruits and vegetables adolescents liked to eat produced a word cloud with the most frequent words in the biggest font sizes (see Figure 4).


Figure 4. Word Cloud for Frequency of Accepted Fruits and Vegetables

When describing what they didn't like about certain foods, adolescents also commonly referred to the taste: *"they taste bad", "flavor",* and *"they taste horrible"*. A few adolescents explained that they didn't like certain fruits because *"some fruits have poisonous seeds"* or that the food was "acidic" One adolescent indicated not liking certain cooked vegetables because *"They're terrible, because they kind of taste burnt".* Other reasons adolescents reported for not liking certain foods are that the foods spoil "like chunky milk and moldy", "use to like cheese, but it gives you gas. It's my sometimes food." A query for the most frequent words used when describing fruits and

vegetables adolescents did not like to eat produced a word cloud with the most frequent words in the biggest font sizes (see Figure 5).

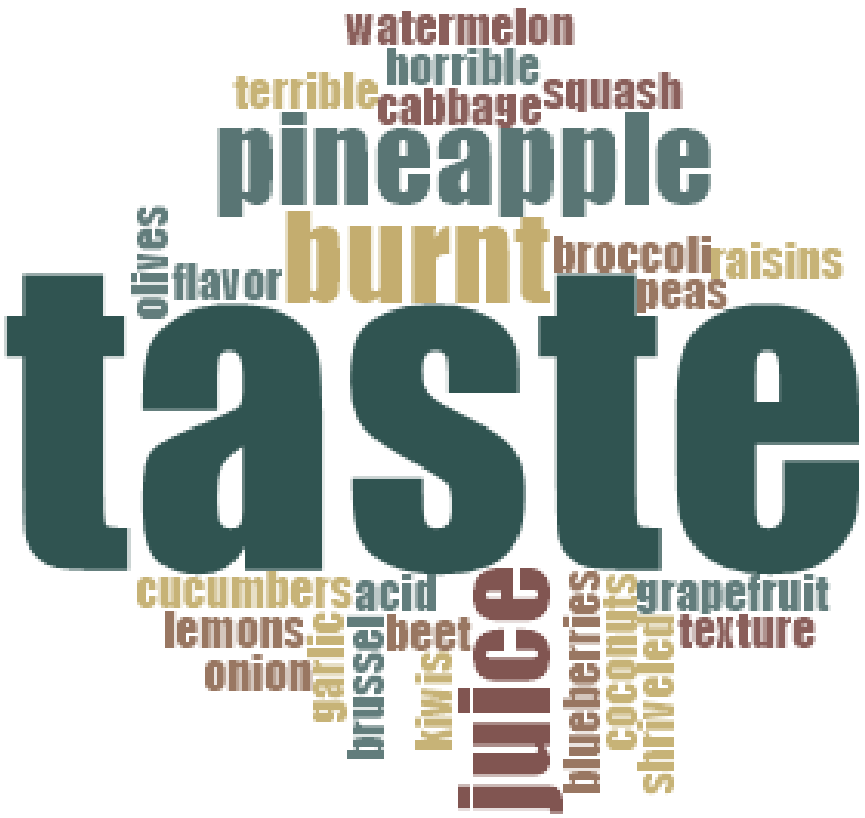



Figure 5. Word Cloud for Frequency of Rejected Fruits and Vegetables

Adolescents reported feedback in favor of the course. They often mentioned several popular dishes they shared in the program. Varying amounts of cooking were reported across adolescent participants: “the only time I cooked was way before I turned 13”, “I haven’t cooked at my house in a long time”, “Mostly I make a sandwich, toast, or something regular. I fix my own ice cream or warm something up like leftovers.”, and “I cooked more than I use to”. One adolescent connected the

experiences with cooking they had at home and in the program: “at home, we cook the same way we do here”.

Some adolescents showed an interest in gardening education in relation to fresh fruits and vegetables. One indicated they liked to eat cucumbers, carrots, and tomatoes because they are fun to eat in a salad and talks about how *“They’re plants. They just grow up from the ground.”* Most adolescents showed little understanding of where their food comes from and how to monitor when food is still safe to eat: *“I don’t know if a vegetable is called ripe when its ready to pick?”, “they are picked when they are full grown. I do know that they cannot rot. But they do mold if left out in the open or something.”*

***Social skills*** of the adolescents were similar between program start and completion (all *p-values* > .05, see Table 3). Qualitative data analysis revealed that the adolescents often referred to family and friends when talking about mealtime activities: *“My little brother really likes bread.”* And *“I like the meats, but I don’t really like the eggs that much. My mom serves it for breakfast almost every time and I gotten tired of it. I wish she would let me eat more bacon like my dad… I know where I get my love of bacon.”*

When asked about cooking, adolescents often referred to family members who cooked: *“my mom cooks most of the time. Sometimes my father cooks.”, “Sometimes I help my mom in the kitchen.”, “We already knew eggs because I use to do it with my grandma.”*

Some of the adolescents think about their lives as adults and having a family. Some indicated they believed being able to cook will be an important skill when they have a family: *" When you grow up, you have to cook for your family" and "So you can take care of your wife.".*

Table 3

*Adolescent Social Skills*

| Variable | Pre Mean ± SD | Post Mean ± SD | t-test |
|---|---|---|---|
| Total Social Responsiveness Score | 72.9 ± 8.18 | 72.1 ± 7.45 | -0.20 |
| Social Awareness | 68.6 ± 5.62 | 70.4 ± 8.96 | 0.47 |
| Social Cognition | 69.0 ± 12.6 | 74.0 ± 9.45 | 0.73 |
| Social Communication | 72.9 ±12.1 | 73.6 ± 9.25 | 0.16 |
| Social Motivation | 67.9 ± 10.47 | 71.9 ± 6.84 | 1.57 |
| Autistic Mannerisms | 69.7 ±10.2 | 69.4 ± 9.66 | -0.07 |

*$p < .05$, **$p < .01$

Qualitative interviews with program teachers revealed that adolescents were observed to begin having conversations about food, making comments outside of the program about food relevant to what they had in the program, and verbally sharing dietary preferences with family members.

***Adaptive functioning*** was maintained in the low average range after participating in the CHEF program ($p > .05$, see table 4). Trends were noticed for increased functioning in the social composite scales and self-care scale, however not significant (all *p-values* > .05).

Table 4

*Adolescent Adaptive Functioning*

| Variable | Pre Mean ± SD | Post Mean ± SD | t-test |
|---|---|---|---|
| Adaptive Functioning Composite | 74.1 ± 7.08 | 72.9 ± 6.36 | -0.45 |
| Conceptual Composite | 75.3 ± 7.23 | 73.3 ± 7.23 | -0.70 |
| Communication | 51.9 ± 4.26 | 51.3 ± 6.75 | -0.37 |
| Functional Academics | 43.7 ± 7.68 | 42.7 ± 7.06 | -0.30 |
| Self-Direction | 37.0 ± 9.82 | 38.1 ± 16.4 | 0.25 |
| Social Composite | 73.6 ± 6.60 | 76.7 ± 6.37 | 1.21 |
| Leisure | 37.6 ± 5.00 | 41.3 ± 3.82 | 2.32 |
| Social | 50.4 ± 6.90 | 49.6 ± 7.76 | -0.29 |
| Practical Composite | 77.9 ± 9.19 | 74.7 ± 8.64 | -0.95 |
| Community Use | 28.3 ± 7.39 | 25.7 ± 6.21 | -1.10 |
| Home Living | 39.1 ± 6.12 | 37.7 ± 4.03 | -0.50 |
| Health and Safety | 41.9 ± 8.36 | 41.0 ± 9.07 | -0.34 |
| Self-Care | 61.3 ± 4.92 | 62.7 ± 3.45 | 0.81 |

*$p < .05$, **$p < .01$

Qualitative analysis with adolescents revealed some adolescents recognized the supervision they still require completing cooking tasks indicating that they can cook “with a grown up help me put it in the oven without burning myself”. Adolescents have shown an understanding for the importance of diet and health: “so you can cook for yourself when you grow up”, “I like vegetables because I think well because they’re good, healthy and delicious and you can put them in sandwiches.”, “they have nutrients”, “they have stuff your body needs”, “they are good for the muscles”, “milk is good for the bones”, “you need food to survive”. Adolescents showed an understanding for the need of independent cooking ability: “so not to have someone else to do everything for you”, “Yeah, so you can actually do things yourself and not just have to use a butler or something.”

Qualitative analysis with program teachers revealed an observed increased confidence in adolescents to cook in the kitchen and face fears they had about cooking with a hot stove or oven. There were increasing reports from parents that their adolescent was capable of some independent skills such as setting the table, requesting items from the grocery store, and being able to suggest ideas for family dinners. One adolescent even indicated wanting to be healthy and asked his mother to buy and cook broccoli: “he maybe ate 4 or 5 foods and after the program his mom reported that he decided he needed to eat more healthy so he can be healthy and strong. And requested that mom buy broccoli. She said, that she almost fainted because he not only has never eaten broccoli, he’s never eaten anything green”.

*Effects of the CHEF Program for Primary Caregivers*

The second aim of the study investigated the effects of the CHEF program on primary caregivers of adolescents with ASD who participated in the program. Primary caregivers were expected to increase their adolescents’ access to healthy food choices, and, experience a reduction in caregiver stress after their adolescent completed the program.

***Parenting feeding practices*** did not significantly change after program completion (all *p-values* > .05, see table 5). Parents showed increased trends in feeding practices such as providing many food choices, using positive persuasion, limiting snacks, and modeling snack consumption. Parents showed trends in reducing fats, insisting for their child to eat, providing special meals for the target child, and using food

as rewards. At the beginning and end of the program, parents reported frequently providing their child with fruits and vegetables. The scores for this measure can range from 0 to 3, and parents consistently reported providing their adolescent with access to fruits and vegetables from program start to completion at a score of 2.71.

Qualitative interviews with adolescents revealed that access to food was an issue for adolescents with ASD. Not having access was a barrier to what varieties are available to eat and what ingredients are available to cook: *"We haven't bought anymore pancake batter."*, *"There wasn't enough left to make for everyone, so I made it for myself."*, *"My mom serves it for breakfast almost every time and I gotten tired of it."*

Table 5

*Parent Feeding Practices*

| Variable | Pre Mean ± SD | Post Mean ± SD | t-test |
|---|---|---|---|
| Cook Meals at Home | 5.86 ± 1.22 | 4.57 ± 2.23 | -1.80 |
| Ate at a Restaurant with Child | 1.14 ± 1.35 | 0.86 ± 0.69 | -0.68 |
| Drive-Thru/Take-Out with Child | 1.29 ± 1.11 | 1.43 ± 0.98 | 0.55 |
| Parent Feeding Practices | | | |
| Daily Fruit & Vegetable Avail. | 2.71 ± 0.30 | 2.71 ± 0.49 | 0.00 |
| Fat Reduction | 1.76 ± 0.37 | 1.71 ± 0.36 | -0.28 |
| Insistence on Eating | 1.42 ± 0.60 | 1.38 ± 0.49 | -0.31 |
| Many Food Choices | 1.82 ± 0.35 | 1.89 ± 0.56 | 0.38 |
| Positive Persuasion | 2.00 ± 0.46 | 2.14 ± 0.30 | 1.00 |
| Snack Limits | 2.76 ± 0.37 | 2.81 ± 0.38 | 1.00 |
| Snack Modeling | 1.81 ± 0.32 | 1.91 ± 0.25 | 1.55 |
| Special Meals | 1.46 ± 0.39 | 1.21 ± 0.17 | -2.05 |
| Use of Rewards | 1.50 ± 0.29 | 1.43 ± 0.35 | -0.51 |

*$p < .05$, **$p < .01$

***Caregiver stress*** in the parent-child relationship was not observed to decrease after their adolescent completed the CHEF program (*all p-values* > .05, see table 6).

However, it is noted that primary caregivers in the current study experienced stress approaching significantly high levels for demands their child places on them (demandingness scale) and disparity between their expectations and their child's actual characteristics (acceptability scale), where scores in the 85$^{th}$ percentile indicated high levels of stress.

Table 6

*Caregiver Stress Percentiles*

| Variable | Pre Mean ± SD | Post Mean ± SD | t-test |
|---|---|---|---|
| Stress in Caregiver-Child Relation. | 82.4 ± 14.4 | 79.7 ± 17.9 | -0.31 |
| Distractibility/Hyperactivity | 79.6 ± 14.4 | 80.1 ± 11.0 | 0.19 |
| Adaptability | 75.4 ± 29.8 | 76.4 ± 13.4 | 0.11 |
| Reinforces | 69.9 ± 21.0 | 61.1 ± 26.8 | -1.40 |
| Demandingness | 85.4 ± 15.1 | 83.7 ± 13.7 | -0.54 |
| Mood | 67.1 ± 27.4 | 78.4 ± 15.9 | 1.15 |
| Acceptability | 82.7 ± 12.2 | 85.4 ± 5.03 | 0.53 |

*$p < .05$, **$p < .01$

Qualitative analysis with program teachers revealed the concerns and challenges parents of adolescents with ASD have regarding dietary behavior of their adolescents: *"Some of the children have been such picky eaters for so long that they had just been resigned to the way that it is and we're not pushing them as much".* Teachers indicate that they often hear parents say *"I'm just thankful for them eating anything at all, I don't care what it is. I don't have time for this. I need them to eat before school and I don't care what it is.".* Many parents reported they were just trying to get through the day and they can worry about their long-term goals after resolving daily challenges.

However, teachers and parents appear to understand that adolescence is a time to revisit these issues and work on building these independent skills for their future: *"as we talk about college one day and living independently or in assisted living or with their roommate, they kind of got a glimpse into their being able to feed themselves.", "it could be as simple as setting reminders on their phone, their house, apartment, dorm, to put those little visual-audio reminders to eat because maybe they'll forget".*

Teachers report that parents were able to see how much their adolescent was capable of after participating in the program: *"parents realized that their children are ready for this independence", "Parents were reporting that they were real excited and that they even remember what was going to happen", "We have their parents realize how much their kids can do independently in the kitchen. The hopes that they would continue to challenge those things", "a few parents that did report interest in wanting to either cook or suggest things on a grocery list",* and *"It was just kind of in their routine. And I think one thing also that the parents realized that their children are ready for this independence. And that they were in the habit and then a routine of doing stuff for them, but with us reporting what we've been practicing and how successful we were. I heard form a lot of parents, 'oh! I just didn't really think like that. But, I guess their ready for this now?'".* One adolescent *"had since requested to go to the grocery store and help mom shop. And so that is a time that's kind of a bonding time that they have together now. He's still maintaining that behavior to this day."*

Teachers report that the adolescents were being tolerable enough to allow their parents to have dinner at other family member's houses: *"he chose to sit at the table*

*with the adults rather than eating in front of the TV like he normally did. Family members were really impressed with that. I don't think he tried too many new foods, but he tolerated all the food that was on the table and ate his meal at the table. And that I did notice that parents would say, the napkin is on the lap, that they would never use to do that. And one helped the parent clear her dishes and they were like 'what, what did she just do?' It's just little things. Parents don't realize how it could affect their day or their view of their child and these kids can take initiative and you need to constantly challenge them."*

One of the favorite things of the CHEF program reported by a program teacher was the natural motivation adolescents had in food and eating: *"Trying to get pre-teens to be motivated and pay attention all at the same time can be challenging… many other social skills you can embed in a cooking class. You can relate it to so many different other skills. You can relate it to dating, because they're starting to think about dating. You can relate it to college, eating out at a restaurant, eating with friends, joining groups in high school… I just felt like it was it just kind of opened the door for me to work on so many other things that I can imbed within that one cooking/eating climate."*

# DISCUSSION

Adolescence is a time to navigate independence and adult roles. This provides an opportune time for adolescents with ASD to learn how to complete activities of daily living such as obtaining food, preparing meals, and incorporating healthy choices into one's diet. Adolescents with ASD increased their acceptability of healthy food choices after participating in the CHEF cooking program, which incorporated multiple components into its curriculum: cooking, nutrition, and social skills components. Their primary caregivers also reported their adolescent to engage in more independent cooking each week. Although quantitative data analysis did not show a statistically significant impact of the CHEF program on specific domains of social skills and adaptive functioning, program teachers observed improvements in these areas in the program and noted improvements from parent reports.

The CHEF cooking program provided a climate supportive of autonomy, competence, relatedness, and preference to develop healthy dietary behavior and independent cooking ability of adolescents with ASD. One additional need in the current study was to encourage primary caregivers to provide more access to healthy food choices in their adolescent's environment. Although caregivers were not observed to increase this feeding practice, caregivers were observed to commonly use this practice since the beginning of the program. Thus, parents were already supporting this need from the beginning of the program. The observed improvement in dietary behavior may

lead to optimal health outcomes as adolescents with ASD transition into adults (Hoelscher, Evans, Parcel, & Kelder, 2002; Lytle, 2002; Ness, Maynard, Frankel, Smith, Frobisher, Leary, … & Gunnell, 2005; Van Duyn & Pivonka, 2000). Longitudinal studies are required to observe these health outcomes as adolescents become adults.

Primary caregivers of participating adolescents experienced stress at levels higher than most and approached clinically high levels. Qualitative analysis revealed that some parents have realized that their adolescent are ready to learn about skills that will help them transition into independently functioning adults in society. Teaching and encouraging adolescents to prepare their own meals may decrease the current burden caregivers experience when attending to their adolescent's demands and potentially future burden caregivers may experience when providing continuous support as their adolescent becomes an adult (Franklin & Rodger, 2003; Hall & Graff, 2011; Meirsschaut, Roeyers, & Warreyn, 2010; Myers, Mackintosh, & Goin-Kochel, 2009; Papageorgiou & Kalyva, 2010; Plant & Sanders, 2007; Suarez, Atchison, & Lagerwey, 2014). Program teachers reported that families have been able to have dinners at a family members house. This can be a start to relieving parents of some burdens and stress they experience when having to supervise and monitor mealtimes with their adolescent and allow families to enjoy visiting friends' houses and restaurants.

## Limitations

The explanatory sequential mixed method design of the current study was a great strength, allowing for an in-depth understanding of how the CHEF program

impacted adolescents with ASD and their primary caregiver. The current study was a pilot study for the development and refinement of the CHEF cooking program for a small sample of adolescents with ASD. Future replications of the program should implement the program with a larger sample size, include comparison groups, incorporate a parent component, record group meal discussions of adolescents for qualitative analysis, and administer a survey to the adolescents on the learning objectives of the program: cooking, nutrition, mealtime and social skills. Greater parent involvement may help the adolescents generalize their learned skills into the home and benefit the family by leading to less demands on the primary caregiver and allow for the family to enjoy leisure activities such as eating out at a restaurant or at a friend's house (Meirsschaut, Roeyers, & Warreyn, 2010; Myers, Mackintosh, & Goin-Kochel, 2009). Adolescent participants' adaptive functioning was in the below average range, indicated by the Adaptive Behavior Assessment System's Adaptive Functioning Composite Score (Mean Score = 72.86). Thus, this study is only generalizable to understanding the effects of a cooking program for adolescents with ASD and similar levels of functioning.

## Future Directions

In the CHEF cooking program should consider adding garden-based, physical activity, and technology components. Garden-based education components are increasingly popular in school-based nutrition programs and have proven to gain children and adolescent's interest, increase knowledge about healthy foods, reduce body mass index of obese/overweight children, increase cooking with healthy foods,

and increase the consumption of fruits and vegetables (Davis, Ventura, Cook, Gyllenhammer, & Gatto, 2011; Heim, Stang, & Ireland, 2009; McAleese, Rankin, & Fada, 2007; Parmer, Salisbury-Glennon, Shannon, & Strumpler, 2009; Robinson-O'Brien, Story, & Heim, 2009). Technology, such as personal digital assistant devices or phone applications, is another component that is not only expected to pique children and adolescents' interests, but also to provide program assistance in any place at any time. Personal digital assistant devices are commonly used to provide prompts to children and adolescents with ASD to guide them through completing various tasks, including daily living skills and cooking (Mechling, Gast, & Seid, 2009; Palmen, Didden, & Verhoeven, 2012). Mechling, Gast, and Seid successfully used picture, auditory, and video prompts to teach three adolescents with ASD and mild to moderate cognitive and adaptive functioning ability to independently cook three recipes: a ham and cheese sandwich on a stove top, macaroni and cheese in a microwave, and individual pizza's in a toaster oven. Mechling, Gast, and Seid believes applying these prompts on a personal digital assistant device not only allows for universal access for people of all disabilities, but also the commercial product would become "relatively affordable". Applying the CHEF cooking program into a hand-held technology device not only increases its accessibility to adolescents with ASD and other related developmental disorders, but is expected to increase affordability. Applying this type of program into technology application can also allow for programs to be tailored and individualized to each person's needs (Hoelsher, Evans, Parcel, & Kelder, 2002). Providing accessible, affordable, and developmentally appropriate intervention through technology may help reduce experiences of caregiver

burden to provide support and on costs of health care services as their adolescent's transition into adults.

In conclusion, quantitative findings revealed adolescents with ASD who participated in the multicomponent CHEF cooking program increased their consumption of fruits and vegetables. Qualitative findings from adolescents and program teachers expanded our understanding of how the CHEF cooking program specifically impacted the behavior of adolescent with ASD and experience of caregiver stress by their parents.

REFERENCES

Abbeduto, L., Seltzer, M. M., Shattuck, P., Krauss, M. W., Orsmond, G., & Murphy, M. M. (2004). Psychological well-being and coping in mothers of youths with autism, down syndrome, or fragile X syndrome. *American Journal on Mental Retardation, 109*(3), 237-254.

Abidin, R. R. (2012). Parenting Stress Index (4th ed): Manual. *Psychological Assessment Resources.*

Addison, L. R., Piazza, C. C., Patel, M. R., Bachmeyer, M. H., Rivas, K. M., Milnes, S. M., & Oddo, J. (2012). A comparison of sensory integrative and behavioral therapies as treatment for pediatric feeding disorders. *Journal of applied behavior analysis, 45*(3), 455-471.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Anderson, D. K., Liang, J. W., & Lord, C. (2014). Predicting young adult outcome among more and less cognitively able individuals with autism spectrum disorders. *Journal of Child Psychology and Psychiatry, 55*(5), 485-494.

Archuleta, M., VanLeeuwen, D., Halderson, K., Bock, M. A., Eastman, W., Powell, J., ... & Wells, L. (2012). Cooking schools improve nutrient intake patterns of people with type 2 diabetes. *Journal of nutrition education and behavior, 44*(4), 319-325.

Ballaban-Gil, K., Rapin, I., Tuchman, R., & Shinnar, S. (1996). Longitudinal examination of the behavioral, language, and social changes in a population of adolescents and young adults with autistic disorder. *Pediatric neurology, 15*(3), 217-223.

Bandini, L. G., Anderson, S. E., Curtin, C., Cermak, S., Evans, E. W., Scampini, R., ... & Must, A. (2010). Food selectivity in children with autism spectrum disorders and typically developing children. *The Journal of pediatrics*, *157*(2), 259-264.

Bandura, A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology and health, 13*(4), 623-649.

Barnard, J., Harvey, V., Potter, D., & Prior, A. (2001). Ignored or ineligible. The reality for adults with autism spectrum disorders. London: National Autistic Society.

Billstedt, E., Gillberg, C., & Gillberg, C. (2005). Autism after adolescence: population-based 13-to 22-year follow-up study of 120 individuals with autism diagnosed in childhood. *Journal of autism and developmental disorders, 35*(3), 351-360.

Blacher, J., & McIntyre, L. L. (2006). Syndrome specificity and behavioural disorders in young adults with intellectual disability: Cultural differences in family impact. *Journal of Intellectual Disability Research, 50*(3), 184-198.

Blanchette, L., & Brug, J. (2005). Determinants of fruit and vegetable consumption among 6–12-year-old children and effective interventions to increase consumption. *Journal of human nutrition and dietetics, 18*(6), 431-443.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101.

Bukhari, A., Fredericks, L., & Wylie-Rosett, J. (2011). Strategies to promote high school students' healthful food choices. *Journal of nutrition education and behavior, 43*(5), 414.

Cadman, T., Eklund, H., Howley, D., Hayward, H., Clarke, H., Findon, J., ... & Glaser, K. (2012). Caregiver burden as people with autism spectrum disorder and attention-deficit/hyperactivity disorder transition into adolescence and adulthood in the United Kingdom. *Journal of the American Academy of Child & Adolescent Psychiatry, 51*(9), 879-888.

Cannella-Malone, H., Sigafoos, J., O'Reilly, M., de la Cruz, B., Edrisinha, C., & Lancioni, G. E. (2006). Comparing video prompting to video modeling for teaching daily living skills to six adults with developmental disabilities*. Education and Training in Developmental Disabilities,* 344-356.

Caraher, M., Seeley, A., Wu, M., & Lloyd, S. (2013). When chefs adopt a school? An evaluation of a cooking intervention in English primary schools. *Appetite, 62*, 50-59.

Cavadini, C., Siega-Riz, A. M., & Popkin, B. M. (2000). US adolescent food intake trends from 1965 to 1996. *Archives of disease in childhood, 83*(1), 18-24.

Cederlund, M., Hagberg, B., Billstedt, E., Gillberg, I. C., & Gillberg, C. (2008). Asperger syndrome and autism: A comparative longitudinal follow-up study more than 5 years after original diagnosis. *Journal of autism and developmental disorders, 38*(1), 72-85.

Christensen, D. L., Baio, J., Braun, K. V., et al. (2016). Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years — Autism and

Developmental Disabilities Monitoring Network, 11 Sites, United States, 2012. *MMWR Surveillance Summary, 65*(3), 1–23.

Chu, Y. L., Farmer, A., Fung, C., Kuhle, S., Storey, K. E., & Veugelers, P. J. (2013). Involvement in home meal preparation is associated with food preference and self-efficacy among Canadian children. *Public Health Nutrition, 16*(01), 108-112.

Constantino, J. N. & Gruber, C. P. (2012). Social Responsiveness Scale (2nd ed): Manual. Torrance, CA: *Western Psychological Services*.

Davis, J. N., Ventura, E. E., Cook, L. T., Gyllenhammer, L. E., & Gatto, N. M. (2011). LA Sprouts: a gardening, nutrition, and cooking intervention for Latino youth improves diet and reduces obesity. *Journal of the American Dietetic Association, 111*(8), 1224-1230.

Dominick, K. C., Davis, N. O., Lainhart, J., Tager-Flusberg, H., & Folstein, S. (2007). Atypical behaviors in children with autism and children with a history of language impairment. *Research in developmental disabilities*, *28*(2), 145-162.

Dumas, J. E., Wolf, L. C., Fisman, S. N., & Culligan, A. (1991). Parenting stress, child behavior problems, and dysphoria in parents of children with autism, Down syndrome, behavior disorders, and normal development. *Exceptionality: A Special Education Journal, 2*(2), 97-110.

Faith, M. S., Scanlon, K. S., Birch, L. L., Francis, L. A., & Sherry, B. (2004). Parent-child feeding strategies and their relationships to child eating and weight status. *Obesity research, 12*(11), 1711-1722.

Franklin, L. & Rodger, S. (2003). Parents' perspectives on feeding medically compromised children: implications for occupational therapy. *Journal of Australian Occupational Therapy, 50,* 137-147.

Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research: interviews and focus groups. *British dental journal, 204*(6), 291-295.

Gillberg, C., & Steffenburg, S. (1987). Outcome and prognostic factors in infantile autism and similar conditions: A population-based study of 46 cases followed through puberty. *Journal of autism and developmental disorders, 17*(2), 273-287.

Goldschmidt, J., & Song, H. J. (2017). Development of Cooking Skills as Nutrition Intervention for Adults with Autism and Other Developmental Disabilities. *Journal of the Academy of Nutrition and Dietetics, 117*(5), 671-679.

Graves, T. B., Collins, B. C., Schuster, J. W., & Kleinert, H. (2005). Using video prompting to teach cooking skills to secondary students with moderate disabilities. *Education and Training in Developmental Disabilities,* 34-46.

Hall, H. R., & Graff, J. C. (2011). The relationships among adaptive behaviors of children with autism, family support, parenting stress, and coping. *Issues in comprehensive pediatric nursing, 34*(1), 4-25.

Harrison, P.L. & Oakland, T. (2015). Adaptive Behavior Assessment System (3rd ed): Manual. San Antonio, TX: *The Psychological Corporation*.

Hartmann, C., Dohle, S., & Siegrist, M. (2013). Importance of cooking skills for balanced food choices. *Appetite, 65*, 125-131.

Heim, S., Stang, J., & Ireland, M. (2009). A garden pilot project enhances fruit and vegetable consumption among children. *Journal of the American Dietetic Association, 109*(7), 1220-1226.

Hendricks, D. R., & Wehman, P. (2009). Transition from school to adulthood for youth with autism spectrum disorders: Review and recommendations. *Focus on Autism and Other Developmental Disabilities.*

Hendy, H. M., Williams, K. E., Camise, T. S., Eckman, N., & Hedemann, A. (2009). The Parent Mealtime Action Scale (PMAS). *Development and association with children's diet and weight. Appetite, 52*(2), 328-339.

Henninger, N. A., & Taylor, J. L. (2013). Outcomes in adults with autism spectrum disorders: A historical perspective. *Autism, 17*(1), 103-116.

Hodge, K., Danish, S., & Martin, J. (2013). Developing a Conceptual Framework for Life Skills Interventions. *The Counseling Psychologist, 41*(8), 1125-1152.

Hoelscher, D. M., Evans, A., Parcel, G., & Kelder, S. (2002). Designing effective nutrition interventions for adolescents. *Journal of the American Dietetic Association, 102*(3), 52-63.

Horne, P. J., Tapper, K., Lowe, C. F., Hardman, C. A., Jackson, M. C., & Woolner, J. (2004). Increasing children's fruit and vegetable consumption: a peer-modelling and rewards-based intervention. *European Journal of Clinical Nutrition, 58*(12), 1649-1660.

Howlin, P. (2000). Outcome in adult life for more able individuals with autism or Asperger syndrome. *Autism, 4*(1), 63-83.

Howlin, P., Goode, S., Hutton, J., & Rutter, M. (2004). Adult outcome for children with autism. *Journal of Child Psychology and Psychiatry, 45*(2), 212-229.

IBM Corp. (2016). IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: *IBM Corp*.

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field methods, 18*(1), 3-20.

Jarpe-Ratner, E., Folkens, S., Sharma, S., Daro, D., & Edens, N. K. (2016). An Experiential Cooking and Nutrition Education Program Increases Cooking Self-Efficacy and Vegetable Consumption in Children in Grades 3–8. *Journal of Nutrition Education and Behavior, 48*(10), 697-705.

Kagan, S. L., & Neuman, M. J. (1998). Lessons from three decades of transition research. *The Elementary School Journal, 98*, 365-379.

Kanne, S. M., Gerber, A. J., Quirmbach, L. M., Sparrow, S. S., Cicchetti, D. V., & Saulnier, C. A. (2011). The role of adaptive behavior in autism spectrum disorders: Implications for functional outcome. *Journal of autism and developmental disorders*, *41*(8), 1007-1018.

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous child*, *2*(3), 217-250.

Kavale, K. A., Forness, S. R., & Siperstein, G. N. (1999). Efficacy of special education and related services. *American Association on Mental Retardation*.

Kehr, D., Nelson, M., & McCaffrey, J. (2015). Integrating Nutrition Education and Media Literacy Into the Common Core Curriculum. *Journal of Nutrition Education and Behavior, 47*(4), S29.

Kenworthy, L., Case, L., Harms, M. B., Martin, A., & Wallace, G. L. (2010). Adaptive behavior ratings correlate with symptomatology and IQ among individuals with high-functioning autism spectrum disorders. *Journal of autism and developmental disorders*, *40*(4), 416-423.

Knapp, M., Romeo, R., & Beecham, J. (2009). Economic cost of autism in the UK. *Autism, 13*(3), 317-336.

Kuschner, E. S., Eisenberg, I. W., Orionzi, B., Simmons, W. K., Kenworthy, L., Martin, A., & Wallace, G. L. (2015). A preliminary study of self-reported food selectivity in adolescents and young adults with autism spectrum disorder. *Research in autism spectrum disorders, 15*, 53-59.

Ledford, J. R., & Gast, D. L. (2006). Feeding Problems in Children With Autism Spectrum Disorders A Review. *Focus on Autism and Other Developmental Disabilities, 21*(3), 153-166.

Levine, E., & Guthrie, J. F. (1997). Nutrient intakes and eating patterns of teenagers. Family Economics and Nutrition Review, 10(3), 20.

Levy, A., & Perry, A. (2011). Outcomes in adolescents and adults with autism: A review of the literature. *Research in Autism Spectrum Disorders, 5*(4), 1271-1282.

Lotter, V. (1974). Factors related to outcome in autistic children. *Journal of Autism and Developmental Disorders, 4*(3), 263-277.

Lowe, C. F., Horne, P. J., Tapper, K., Bowdery, M., & Egerton, C. (2004). Effects of a peer modelling and rewards-based intervention to increase fruit and vegetable consumption in children. *European journal of clinical nutrition, 58*(3), 510-522.

Lukens, C. T., & Linscheid, T. R. (2008). Development and validation of an inventory to assess mealtime behavior problems in children with autism. *Journal of autism and developmental disorders, 38*(2), 342-352.

Lytle, L. A. (2002). Nutritional issues for adolescents. *Journal of the American Dietetic Association, 102*(3), S8-S12.

Martins, Y., Young, R. L., & Robson, D. C. (2008). Feeding and eating behaviors in children with autism and typically developing children. *Journal of autism and developmental disorders, 38*(10), 1878-1887.

Mascola, A. J., Bryson, S. W., & Agras, W. S. (2010). Picky eating during childhood: A longitudinal study to age 11years. *Eating behaviors*, *11*(4), 253-257.

Matson, J. L., & Fodstad, J. C. (2009). The treatment of food selectivity and other feeding problems in children with autism spectrum disorders. *Research in Autism Spectrum Disorders, 3*(2), 455-461.

Marriage, S., Wolverton, A., & Marriage, K. (2009). Autism spectrum disorder grown up: A chart review of adult functioning. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 18*(4), 322.

McAleese, J. D., & Rankin, L. L. (2007). Garden-based nutrition education affects fruit and vegetable consumption in sixth-grade adolescents. *Journal of the American Dietetic Association, 107*(4), 662-665.

Mechling, L. C., Ayres, K. M., Foster, A. L., & Bryant, K. J. (2013). Comparing the effects of commercially available and custom-made video prompting for teaching cooking skills to high school students with autism. *Remedial and Special Education, 34*(6), 371-383.

Mechling, L. C., Gast, D. L., & Seid, N. H. (2009). Using a personal digital assistant to increase independent task completion by students with autism spectrum disorder. *Journal of autism and developmental disorders, 39*(10), 1420-1434.

Mechling, L. C., & Gustafson, M. R. (2008). Comparison of static picture and video prompting on the performance of cooking-related tasks by students with autism. *Journal of Special Education Technology, 23*(3), 31-45.

Mechling, L. C., & Stephens, E. (2009). Comparison of self-prompting of cooking skills via picture-based cookbooks and video recipes. *Education and Training in Developmental Disabilities*, 218-236.

Meirsschaut, M., Roeyers, H., & Warreyn, P. (2010). Parenting in families with a child with autism spectrum disorder and a typically developing child: Mothers' experiences and cognitions. *Research in Autism Spectrum Disorders, 4*(4), 661-669.

Munoz, K. A., Krebs-Smith, S. M., Ballard-Barbash, R., & Cleveland, L. E. (1997). Food intakes of US children and adolescents compared with recommendations. *Pediatrics, 100*(3), 323-329.

Myers, B. J., Mackintosh, V. H., & Goin-Kochel, R. P. (2009). "My greatest joy and my greatest heart ache:" Parents' own words on how having a child in the autism spectrum has affected their lives and their families' lives. *Research in Autism Spectrum Disorders, 3*(3), 670-684.

Ness, A. R., Maynard, M., Frankel, S., Smith, G. D., Frobisher, C., Leary, S. D., ... & Gunnell, D. (2005). Diet in childhood and adult cardiovascular and all cause mortality: the Boyd Orr cohort. *Heart, 91*(7), 894-898.

NVivo qualitative data analysis Software. (2015). QSR International Pty Ltd. Version 11.

Palmen, A., Didden, R., & Verhoeven, L. (2012). A personal digital assistant for improving independent transitioning in adolescents with high-functioning autism spectrum disorder. *Developmental Neurorehabilitation, 15*(6), 401-413.

Papageorgiou, V., & Kalyva, E. (2010). Self-reported needs and expectations of parents of children with autism spectrum disorders who participate in support groups. *Research in Autism Spectrum Disorders, 4*(4), 653-660.

Parmer, S. M., Salisbury-Glennon, J., Shannon, D., & Struempler, B. (2009). School gardens: an experiential learning approach for a nutrition education program to increase fruit and vegetable knowledge, preference, and consumption among second-grade students. *Journal of nutrition education and behavior, 41*(3), 212-217.

Perry, A., Flanagan, H. E., Geier, J. D., & Freeman, N. L. (2009). Brief report: The Vineland Adaptive Behavior Scales in young children with autism spectrum disorders at different cognitive levels. *Journal of autism and developmental disorders, 39*(7), 1066-1078.

Peterson, K. M., Piazza, C. C., & Volkert, V. M. (2016). A comparison of a modified sequential oral sensory approach to an applied behavior-analytic approach in the treatment of food selectivity in children with autism spectrum disorders. *Journal of Applied Behavior Analysis, 49*(3), 1-27.

Pierce, K. L., & Schreibman, L. (1994). Teaching daily living skills to children with autism in unsupervised settings through pictorial self-management. *Journal of applied behavior analysis, 27*(3), 471-481.

Plant, K. M., & Sanders, M. R. (2007). Predictors of care-giver stress in families of preschool-aged children with developmental disabilities. *Journal of Intellectual Disability Research, 51*(2), 109-124.

Polloway, E. A., Patton, J. R., & Serna, L. (2001). Strategies for teaching learners with special needs. Upper Saddle River, NJ: *Merrill Prentice Hall*.

Robinson-O'Brien, R., Story, M., & Heim, S. (2009). Impact of garden-based youth nutrition intervention programs: a review. *Journal of the American Dietetic Association, 109*(2), 273-280.

Rogers, L. G., Magill-Evans, J., & Rempel, G. R. (2012). Mothers' challenges in feeding their children with autism spectrum disorder—Managing more than just picky eating. *Journal of Developmental and Physical Disabilities, 24*(1), 19-33.

Roseman, M. G., Riddell, M. C., & Haynes, J. N. (2011). A content analysis of kindergarten-12th grade school-based nutrition interventions: taking advantage of past learning. *Journal of nutrition education and behavior, 43*(1), 2-18.

Schreck, K. A., & Williams, K. (2006). Food preferences and factors influencing food selectivity for children with autism spectrum disorders. *Research in developmental disabilities, 27*(4), 353-363.

Schreck, K. A., Williams, K., & Smith, A. F. (2004). A comparison of eating behaviors between children with and without autism. *Journal of autism and developmental disorders, 34*(4), 433-438.

Seiverling, L. J., Hendy, H. M., & Williams, K. E. (2011). Child and parent variables associated with texture problems in children's feeding. *Journal of Developmental and Physical Disabilities, 23*(4), 303-311.

Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary education and employment among youth with an autism spectrum disorder. *Pediatrics,* 1042-1049.

Shipley-Benamou, R., Lutzker, J. R., & Taubman, M. (2002). Teaching daily living skills to children with autism through instructional video modeling. *Journal of Positive Behavior Interventions, 4(*3), 166-177.

Sigafoos, J., O'Reilly, M., Cannella, H., Upadhyaya, M., Edrisinha, C., Lancioni, G. E., ... & Young, D. (2005). Computer-presented video prompting for teaching microwave oven use to three adults with developmental disabilities. *Journal of Behavioral Education, 14*(3), 189-201.

Smith, L. E., Maenner, M. J., & Seltzer, M. M. (2012). Developmental trajectories in adolescents and adults with autism: The case of daily living skills. *Journal of the American Academy of Child & Adolescent Psychiatry, 51*(6), 622-631.

Smith, M. D., & Philippen, L. R. (2005). Community integration and supported employment. *Autism spectrum disorders: Identification, education, and treatment,* 493-514.

Sparrow, S. S., Cicchetti, D. V., & Balla, D. A. (2005). Vineland adaptive behavior scales: (Vineland II), survey interview form/caregiver rating form. Livonia, MN: *Pearson Assessments.*

Stoner, J. B., Angell, M. E., House, J. J., & Bock, S. J. (2007). Transitions: Perspectives from parents of young children with autism spectrum disorder (ASD). *Journal of Developmental and Physical Disabilities*, *19*(1), 23-39.

Suarez, M. A., Atchison, B. J., & Lagerwey, M. (2014). Phenomenological examination of the mealtime experience for mothers of children with autism and food selectivity. *American Journal of Occupational Therapy, 68*(1), 102-107.

Thierfeld Brown, J., Wolf, L. E., King, L., & Bork, G. R. K. (2012). The parent's guide to college for students on the autism spectrum. Shawnee Mission, KS: *AAPC Publishing*.

Van Duyn, M. A. S., & Pivonka, E. (2000). Overview of the health benefits of fruit and vegetable consumption for the dietetics professional: selected literature. *Journal of the American Dietetic Association, 100*(12), 1511-1521.

Van Laarhoven, T., Kraus, E., Karpman, K., Nizzi, R., & Valentino, J. (2010). A comparison of picture and video prompts to teach daily living skills to individuals with autism. *Focus on Autism and Other Developmental Disabilities, 25*(4), 195-208.

van Schalkwyk, G. I., & Volkmar, F. R. (2015). Autism spectrum disorders: In theory and practice. *The Psychoanalytic study of the child, 69*(1), 219-241.

van Schalkwyk, G. I., & Volkmar, F. R. (2017). Autism Spectrum Disorders: Challenges and Opportunities for Transition to Adulthood. *Child and Adolescent Psychiatric Clinics of North America, 26*(2), 329-339.

VanBergeijk, E., Klin, A., & Volkmar, F. (2008). Supporting more able students on the autism spectrum: College and beyond. *Journal of autism and developmental disorders, 38*(7), 1359-1370.

Wang, M. C., Rauzon, S., Studer, N., Martin, A. C., Craig, L., Merlo, C., ... & Crawford, P. (2010). Exposure to a comprehensive school intervention increases vegetable consumption. *Journal of Adolescent Health, 47*(1), 74-82.

Wardle, J., Cooke, L. J., Gibson, E. L., Sapochnik, M., Sheiham, A., & Lawson, M. (2003). Increasing children's acceptance of vegetables; a randomized trial of parent-led exposure. *Appetite, 40*(2), 155-162.

Wehman, P. (2006). Individualized transition planning: Putting self determination into action. *Life beyond the classroom: Transition strategies for young people with disabilities,* 71-96.

# APPENDIX A

## INSTITUTIONAL REVIEW BOARD APPROVAL FORM AND RENEWAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Institutional Review Board for Human Use

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on January 24, 2017. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56.

| | |
|---|---|
| Principal Investigator: | TRINH, EVA |
| Co-Investigator(s): | |
| Protocol Number: | **X150813001** |
| Protocol Title: | *Effects of a Social Skills Focused Cooking Class on Social Skills, Adaptive Behavior, and Eating Behavior in an After-School Awareness Program* |

The IRB reviewed and approved the above named project on 8-21-15. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 8-21-15

Date IRB Approval Issued: 8-21-15

IRB Approval No Longer Valid On: 8-21-16

HIPAA Waiver Approved?: No

Partial HIPAA Waiver Approved?: No

Marilyn Dass

Member - Institutional Review Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of
Alabama at Birmingham
Mailing Address:
AB 470
1720 2ND AVE S
BIRMINGHAM AL 35294-0104

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Institutional Review Board for Human Use

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on January 24, 2017. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56.

| | |
|---|---|
| Principal Investigator: | TRINH, EVA |
| Co-Investigator(s): | |
| Protocol Number: | **X150813001** |
| Protocol Title: | *Effects of a Social Skills Focused Cooking Class on Social Skills, Adaptive Behavior, and Eating Behavior in an After-School Awareness Program* |

The IRB reviewed and approved the above named project on 8-16-16 The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 8-16-16

Date IRB Approval Issued: 8-16-16

IRB Approval No Longer Valid On: 8-16-17

HIPAA Waiver Approved?: No

Partial HIPAA Waiver Approved?: No

Marilyn Dass

Expedited Reviewer
Member - Institutional Review Board
for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of
Alabama at Birmingham
Mailing Address:
AB 470
1720 2ND AVE S
BIRMINGHAM AL 35294-0104

# APPENDIX B

# CHEF PROGRAM MANUAL

# CHEF PROGRAM MANUAL

## Session 1 – Creating A meal

Provide materials on the next page to parents

Talk about cooking this semester

- Do you cook?
- Do you help your family cook?
  - What appliances have you used-be cautious for burns
  - Read instructions on packages

Creating meal

- What would you like to learn to cook?
- What ingredients would you need?
- Does that cover 3 out of 5 food groups? Remember, we are already serving milk which means dairy is already in the meal. You need to include 3 out of 5 other foods groups.

Each recipe below should be modified to what your teen's choose as their meal.

Provide the hand-outs to the class and discuss the topics: (Choosemyplate.gov materials)

- Food pyramid and exercising
- Nutrient intake for teen girls and teen boys
- (more materials attached in the following pages)

Discuss cooking with the class. Open discussion with "Has anyone ever cooked a meal? What have you cooked before?", "What types of food have you helped your mom or family cook?", "What are your favorite things to eat?".

Table-Top Discussion Topic Cards

Create table-top discussion topic cards. You can print and laminate them to place in the middle of the table for adolescents to pick as a group discussion. You can re-use these cards if some of the class is sitting and waiting for food to be cooked or if the class needs inspiration for mealtime discussion topics.

Table-top Discussion Topic Card Questions:

Name a yellow food you ate today or this week!

Which flavor do you like better, chocolate or vanilla?

How many ingredients went into your dinner?

If you were a fruit, what would you be?

What recipe can you make on your own?

If you had a kitchen super-power, what would it be?

What food are you afraid to try? Why?

[These questions are adapted from Cooking Class Kids Cookbook by Deanna F. Cook]

Materials for parents:

10 tips
Nutrition Education Series

# kid-friendly veggies and fruits

## 10 tips for making healthy foods more fun for children

Encourage children to eat vegetables and fruits by making it fun. Provide healthy ingredients and let kids help with preparation, based on their age and skills. Kids may try foods they avoided in the past if they helped make them.

### 1 smoothie creations

Blend fat-free or low-fat yogurt or milk with fruit pieces and crushed ice. Use fresh, frozen, canned, and even overripe fruits. Try bananas, berries, peaches, and/or pineapple. If you freeze the fruit first, you can even skip the ice!

### 2 delicious dippers

Kids love to dip their foods. Whip up a quick dip for veggies with yogurt and seasonings such as herbs or garlic. Serve with raw vegetables like broccoli, carrots, or cauliflower. Fruit chunks go great with a yogurt and cinnamon or vanilla dip.

### 3 caterpillar kabobs

Assemble chunks of melon, apple, orange, and pear on skewers for a fruity kabob. For a raw veggie version, use vegetables like zucchini, cucumber, squash, sweet peppers, or tomatoes.

### 4 personalized pizzas

Set up a pizza-making station in the kitchen. Use whole-wheat English muffins, bagels, or pita bread as the crust. Have tomato sauce, low-fat cheese, and cut-up vegetables or fruits for toppings. Let kids choose their own favorites. Then pop the pizzas into the oven to warm.

### 5 fruity peanut butterfly

Start with carrot sticks or celery for the body. Attach wings made of thinly sliced apples with peanut butter and decorate with halved grapes or dried fruit.

### 6 frosty fruits

Frozen treats are bound to be popular in the warm months. Just put fresh fruits such as melon chunks in the freezer (rinse first). Make "popsicles" by inserting sticks into peeled bananas and freezing.

### 7 bugs on a log

Use celery, cucumber, or carrot sticks as the log and add peanut butter. Top with dried fruit such as raisins, cranberries, or cherries, depending on what bugs you want!

### 8 homemade trail mix

Skip the pre-made trail mix and make your own. Use your favorite nuts and dried fruits, such as unsalted peanuts, cashews, walnuts, or sunflower seeds mixed with dried apples, pineapple, cherries, apricots, or raisins. Add whole-grain cereals to the mix, too.

### 9 potato person

Decorate half a baked potato. Use sliced cherry tomatoes, peas, and low-fat cheese on the potato to make a funny face.

### 10 put kids in charge

Ask your child to name new veggie or fruit creations. Let them arrange raw veggies or fruits into a fun shape or design.

USDA United States Department of Agriculture Center for Nutrition Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.

DG TipSheet No. 11
June 2011

10 tips
Nutrition Education Series

# snack tips for parents

## 10 tips for healthy snacking

Snacks can help children get the nutrients needed to grow and maintain a healthy weight. Prepare single-serving snacks for younger children to help them get just enough to satisfy their hunger. Let older kids make their own snacks by keeping healthy foods in the kitchen. Visit ChooseMyPlate.gov to help you and your kids select a satisfying snack.

### 1 save time by slicing veggies

Store sliced vegetables in the refrigerator and serve with dips like hummus or low-fat dressing. Top half a whole-wheat English muffin with spaghetti sauce, chopped vegetables, and low-fat shredded mozzarella and melt in the microwave.

### 2 mix it up

For older school-age kids, mix dried fruit, unsalted nuts, and popcorn in a snack-size bag for a quick trail mix. Blend plain fat-free or low-fat yogurt with 100% fruit juice and frozen peaches for a tasty smoothie.

### 3 grab a glass of milk

A cup of low-fat or fat-free milk or milk alternative (soy milk) is an easy way to drink a healthy snack.

### 4 go for great whole grains


Offer whole-wheat breads, popcorn, and whole-oat cereals that are high in fiber and low in added sugars, saturated fat, and sodium. Limit refined-grain products such as snack bars, cakes, and sweetened cereals.

### 5 nibble on lean protein

Choose lean protein foods such as low-sodium deli meats, unsalted nuts, or eggs. Wrap sliced, low-sodium deli turkey or ham around an apple wedge. Store unsalted nuts in the pantry or peeled, hard-cooked (boiled) eggs in the refrigerator for kids to enjoy any time.

### 6 keep an eye on the size

Snacks shouldn't replace a meal, so look for ways to help your kids understand how much is enough. Store snack-size bags in the cupboard and use them to control serving sizes.

### 7 fruits are quick and easy

Fresh, frozen, dried, or canned fruits can be easy "grab-and-go" options that need little preparation. Offer whole fruit and limit the amount of 100% juice served.

### 8 consider convenience



A single-serving container of low-fat or fat-free yogurt or individually wrapped string cheese can be just enough for an after-school snack.

### 9 swap out the sugar

Keep healthier foods handy so kids avoid cookies, pastries, or candies between meals. Add seltzer water to a ½ cup of 100% fruit juice instead of offering soda.

### 10 prepare homemade goodies

For homemade sweets, add dried fruits like apricots or raisins and reduce the amount of sugar. Adjust recipes that include fats like butter or shortening by using unsweetened applesauce or prune puree for half the amount of fat.

USDA United States Department of Agriculture

Go to www.ChooseMyPlate.gov for more information.

DGTipSheet No. 24
March 2013
Center for Nutrition Policy and Promotion

10 tips
Nutrition Education Series

# build a healthy meal

## 10 tips for healthy meals


A healthy meal starts with more vegetables and fruits and smaller portions of protein and grains. Think about how you can adjust the portions on your plate to get more of what you need without too many calories. And don't forget dairy—make it the beverage with your meal or add fat-free or low-fat dairy products to your plate.

### 1 make half your plate veggies and fruits

Vegetables and fruits are full of nutrients and may help to promote good health. Choose red, orange, and dark-green vegetables such as tomatoes, sweet potatoes, and broccoli.

### 2 add lean protein

Choose protein foods, such as lean beef and pork, or chicken, turkey, beans, or tofu. Twice a week, make seafood the protein on your plate.

### 3 include whole grains

Aim to make at least half your grains whole grains. Look for the words "100% whole grain" or "100% whole wheat" on the food label. Whole grains provide more nutrients, like fiber, than refined grains.

### 4 don't forget the dairy

Pair your meal with a cup of fat-free or low-fat milk. They provide the same amount of calcium and other essential nutrients as whole milk, but less fat and calories. Don't drink milk? Try soymilk (soy beverage) as your beverage or include fat-free or low-fat yogurt in your meal.

### 5 avoid extra fat

Using heavy gravies or sauces will add fat and calories to otherwise healthy choices. For example, steamed broccoli is great, but avoid topping it with cheese sauce. Try other options, like a sprinkling of low-fat parmesan cheese or a squeeze of lemon.

### 6 take your time

Savor your food. Eat slowly, enjoy the taste and textures, and pay attention to how you feel. Be mindful. Eating very quickly may cause you to eat too much.

### 7 use a smaller plate

Use a smaller plate at meals to help with portion control. That way you can finish your entire plate and feel satisfied without overeating.

### 8 take control of your food

Eat at home more often so you know exactly what you are eating. If you eat out, check and compare the nutrition information. Choose healthier options such as baked instead of fried.

### 9 try new foods

Keep it interesting by picking out new foods you've never tried before, like mango, lentils, or kale. You may find a new favorite! Trade fun and tasty recipes with friends or find them online.

### 10 satisfy your sweet tooth in a healthy way

Indulge in a naturally sweet dessert dish—fruit! Serve a fresh fruit cocktail or a fruit parfait made with yogurt. For a hot dessert, bake apples and top with cinnamon.

USDA United States Department of Agriculture
Center for Nutrition Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.

DG TipSheet No. 7
June 2011
USDA is an equal opportunity provider and employer.

# Getting Started with MyPlate

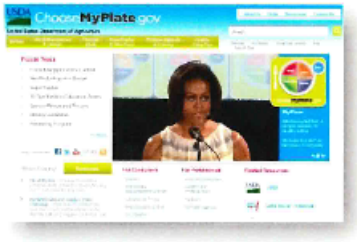
ChooseMyPlate.gov

## MyPlate Icon

- MyPlate is part of a larger communications initiative based on *2010 Dietary Guidelines for Americans* to help consumers make better food choices.
- MyPlate is designed to *remind* Americans to eat healthfully; it is not intended to change consumer behavior alone.
- MyPlate illustrates the five food groups using a familiar mealtime visual, a place setting.


## ChooseMyPlate.gov

- The website features practical information and tips to help Americans build healthier diets.
- It features selected messages to help consumers focus on key behaviors. Selected messages include:
  - **Balancing Calories**
    - Enjoy your food, but eat less.
    - Avoid oversized portions.
  - **Foods to Increase**
    - Make half your plate fruits and vegetables.
    - Make at least half your grains whole grains.
    - Switch to fat-free or low-fat (1%) milk.
  - **Foods to Reduce**
    - Compare sodium in foods like soup, bread, and frozen meals—and choose foods with lower numbers.
    - Drink water instead of sugary drinks.

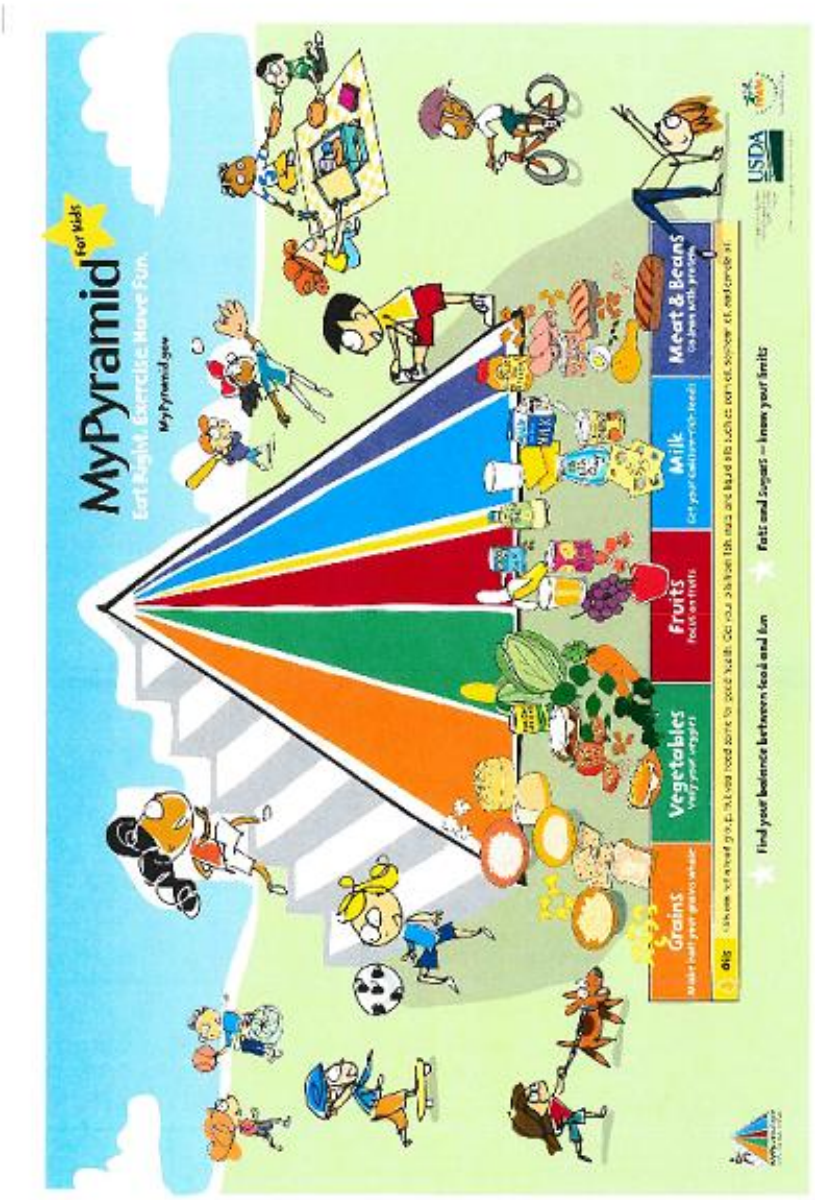



- ChooseMyPlate.gov includes much of the consumer and professional information formerly found on MyPyramid.gov.

USDA
U.S. Department of Agriculture
Center for Nutrition Policy and Promotion

Revised August 2012

Materials for Adolescents (Taught by Program Teachers)



USDA

10 tips Nutrition Education Series

# choose the foods you need to grow

## 10 tips for teen guys


Feed your growing body by making better food choices today as a teen and as you continue to grow into your twenties. Make time to be physically active every day to help you be ¿t and healthy as you grow.

### 1 get over the idea of magic foods

There are no magic foods to eat for good health. Teen guys need to eat foods such as vegetables, fruits, whole grains, protein foods, and fat-free or low-fat dairy foods. Choose protein foods like unsalted nuts, beans, lean meats, and ¿sh. SuperTracker.usda.gov will show if you are getting the nutrients you need for growth.

### 2 always hungry?

Whole grains that provide ¿ber can give you a feeling of fullness and provide key nutrients. Choose half your grains as whole grains. Eat whole-wheat breads, pasta, and brown rice instead of white bread, rice, or other ru¿ned grains. Also, choose vegetables and fruits when you need to "¿ll-up."

### 3 keep water handy

Water is a better option than many other drink choices. Keep a water bottle in your backpack and at your desk to satisfy your thirst. Skip soda, fruit drinks, and energy and sports drinks. They are sugar-sweetened and have few nutrients.

### 4 make a list of favorite foods

Like green apples more than red apples? Ask your family food shopper to buy quick-to-eat foods for the fridge like mini-carrots, apples, oranges, low-fat cheese slices, or yogurt. And also try dried fruit; unsalted nuts; whole-grain breads, cereal, and crackers; and popcorn.

### 5 start cooking often

Get over being hungry by ¿xing your own snacks and meals. Learn to make vegetable omelets, bean quesadillas, or a batch of spaghetti. Prepare your own food so you can make healthier meals and snacks. Microwaving frozen pizzas doesn't count as home cooking.

### 6 skip foods that can add unwanted pounds

Cut back on calories by limiting fatty meats like ribs, bacon, and hot dogs. Some foods are just occasional treats like pizza, cakes, cookies, candies, and ice cream. Check out the caloric content of sugary drinks by reading the Nutrition Facts label. Many 12-ounce sodas contain 10 teaspoons of sugar.

### 7 learn how much food you need

Teen guys may need more food than most adults, teen girls, and little kids. Go to www.SuperTracker.usda.gov. It shows how much food you need based on your age, height, weight, and activity level. It also tracks progress towards ¿tness goals.

SuperTracker

### 8 check Nutrition Facts labels

To grow, your body needs vitamins and minerals. Calcium and vitamin D are especially important for your growing bones. Read Nutrition Facts labels for calcium. Dairy foods provide the minerals your bones need to grow.

### 9 strengthen your muscles

Work on strengthening and aerobic activities. Work out at least 10 minutes at a time to see a better you. However, you need to get at least 60 minutes of physical activity every day.

### 10 ¿ll your plate like MyPlate

Go to www.ChooseMyPlate.gov for more easy tips and science-based nutrition from the Dietary Guidelines for Americans (www.DietaryGuidelines.gov).

USDA

10 tips
Nutrition Education Series

# eat smart and be active as you grow

## 10 healthy tips for teen girls

Young girls, ages 10 to 19, have a lot of changes going on in their bodies. Building healthier habits will help you—now as a growing teen—and later in life. Growing up means you are in charge of foods you eat and the time you spend being physically active every day.

### 1 build strong bones

A good diet and regular physical activity can build strong bones throughout your life. Choose fat-free or low-fat milk, cheeses, and yogurt to get the vitamin D and calcium your growing bones need. Strengthen your bones three times a week doing activities such as running, gymnastics, and skating.


### 2 cut back on sweets

Cut back on sugary drinks. Many 12-ounce cans of soda have 10 teaspoons of sugar in them. Drink water when you are thirsty. Sipping water and cutting back on cakes, candies, and sweets helps to maintain a healthy weight.

### 3 power up with whole grain

Fuel your body with nutrient-packed whole-grain foods. Make sure that at least half your grain foods are whole grains such as brown rice, whole-wheat breads, and popcorn.

### 4 choose vegetables rich in color

Brighten your plate with vegetables that are red, orange, or dark green. Try acorn squash, cherry tomatoes, or sweet potatoes. Spinach and beans also provide vitamins like folate and minerals like potassium that are essential for healthy growth.

### 5 check Nutrition Facts labels for iron

Read Nutrition Facts labels to find foods containing iron. Most protein foods like meat, poultry, eggs, and beans have iron, and so do fortified breakfast cereals and breads.

### 6 be a healthy role model

Encourage your friends to practice healthier habits. Share what you do to work through challenges. Keep your computer and TV time to less than 2 hours a day (unless it's school work).

### 7 try something new

Keep healthy eating fun by picking out new foods you've never tried before like lentils, mango, quinoa, or kale.

### 8 make moving part of every event

Being active makes everyone feel good. Aim for 60 minutes of physical activity each day. Move your body often. Dancing, playing active games, walking to school with friends, swimming, and biking are only a few fun ways to be active. Also, try activities that target the muscles in your arms and legs.

### 9 include all food groups daily

Use MyPlate as your guide to include all food groups each day. Learn more at www.ChooseMyPlate.gov.

### 10 everyone has different needs

Get nutrition information based on your age, gender, height, weight, and physical activity level. Use SuperTracker to find your calorie level, choose the foods you need, and track progress toward your goals. Learn more at www.SuperTracker.usda.gov.

**SuperTracker**

10 tips
Nutrition Education Series

# choose MyPlate

## 10 tips to a great plate


Making food choices for a healthy lifestyle can be as simple as using these 10 Tips. Use the ideas in this list to balance your calories, to choose foods to eat more often, and to cut back on foods to eat less often.

### 1 balance calories

Find out how many calories YOU need for a day as a first step in managing your weight. Go to www.ChooseMyPlate.gov to find your calorie level. Being physically active also helps you balance calories.

### 2 enjoy your food, but eat less

Take the time to fully enjoy your food as you eat it. Eating too fast or when your attention is elsewhere may lead to eating too many calories. Pay attention to hunger and fullness cues before, during, and after meals. Use them to recognize when to eat and when you've had enough.

### 3 avoid oversized portions

Use a smaller plate, bowl, and glass. Portion out foods before you eat. When eating out, choose a smaller size option, share a dish, or take home part of your meal.

### 4 foods to eat more often

Eat more vegetables, fruits, whole grains, and fat-free or 1% milk and dairy products. These foods have the nutrients you need for health—including potassium, calcium, vitamin D, and fiber. Make them the basis for meals and snacks.

### 5 make half your plate fruits and vegetables

Choose red, orange, and dark-green vegetables like tomatoes, sweet potatoes, and broccoli, along with other vegetables for your meals. Add fruit to meals as part of main or side dishes or as dessert.

### 6 switch to fat-free or low-fat (1%) milk

They have the same amount of calcium and other essential nutrients as whole milk, but fewer calories and less saturated fat.

### 7 make half your grains whole grains

To eat more whole grains, substitute a whole-grain product for a refined product—such as eating whole-wheat bread instead of white bread or brown rice instead of white rice.

### 8 foods to eat less often

Cut back on foods high in solid fats, added sugars and salt. They include cakes, cookies, ice cream, candies, sweetened drinks, pizza, and fatty meats like ribs, sausages, bacon, and hot dogs. Use these foods as occasional treats, not everyday foods.

### 9 compare sodium in foods

Use the Nutrition Facts label to choose lower sodium versions of foods like soup, bread, and frozen meals. Select canned foods labeled "low sodium," "reduced sodium," or "no salt added."

### 10 drink water instead of sugary drinks

Cut calories by drinking water or unsweetened beverages. Soda, energy drinks, and sports drinks are a major source of added sugar, and calories, in American diets.

USDA United States Department of Agriculture
Center for Nutrition Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.

DG TipSheet No. 1
June 2011

10 tips
Nutrition Education Series

# choose MyPlate

## 10 tips to a great plate


Making food choices for a healthy lifestyle can be as simple as using these 10 Tips. Use the ideas in this list to balance your calories, to choose foods to eat more often, and to cut back on foods to eat less often.

### 1 balance calories

Find out how many calories YOU need for a day as a first step in managing your weight. Go to www.ChooseMyPlate.gov to find your calorie level. Being physically active also helps you balance calories.

### 2 enjoy your food, but eat less

Take the time to fully enjoy your food as you eat it. Eating too fast or when your attention is elsewhere may lead to eating too many calories. Pay attention to hunger and fullness cues before, during, and after meals. Use them to recognize when to eat and when you've had enough.

### 3 avoid oversized portions

Use a smaller plate, bowl, and glass. Portion out foods before you eat. When eating out, choose a smaller size option, share a dish, or take home part of your meal.

### 4 foods to eat more often

Eat more vegetables, fruits, whole grains, and fat-free or 1% milk and dairy products. These foods have the nutrients you need for health—including potassium, calcium, vitamin D, and fiber. Make them the basis for meals and snacks.

### 5 make half your plate fruits and vegetables

Choose red, orange, and dark-green vegetables like tomatoes, sweet potatoes, and broccoli, along with other vegetables for your meals. Add fruit to meals as part of main or side dishes or as dessert.

### 6 switch to fat-free or low-fat (1%) milk

They have the same amount of calcium and other essential nutrients as whole milk, but fewer calories and less saturated fat.

### 7 make half your grains whole grains

To eat more whole grains, substitute a whole-grain product for a refined product—such as eating whole-wheat bread instead of white bread or brown rice instead of white rice.

### 8 foods to eat less often

Cut back on foods high in solid fats, added sugars and salt. They include cakes, cookies, ice cream, candies, sweetened drinks, pizza, and fatty meats like ribs, sausages, bacon, and hot dogs. Use these foods as occasional treats, not everyday foods.

### 9 compare sodium in foods

Use the Nutrition Facts label to choose lower sodium versions of foods like soup, bread, and frozen meals. Select canned foods labeled "low sodium," "reduced sodium," or "no salt added."

### 10 drink water instead of sugary drinks

Cut calories by drinking water or unsweetened beverages. Soda, energy drinks, and sports drinks are a major source of added sugar, and calories, in American diets.

USDA United States Department of Agriculture
Center for Nutrition Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.

DG TipSheet No. 1
June 2011

10 tips
Nutrition Education Series

# build a healthy meal

## 10 tips for healthy meals


A healthy meal starts with more vegetables and fruits and smaller portions of protein and grains. Think about how you can adjust the portions on your plate to get more of what you need without too many calories. And don't forget dairy—make it the beverage with your meal or add fat-free or low-fat dairy products to your plate.

### 1 make half your plate veggies and fruits

Vegetables and fruits are full of nutrients and may help to promote good health. Choose red, orange, and dark-green vegetables such as tomatoes, sweet potatoes, and broccoli.

### 2 add lean protein

Choose protein foods, such as lean beef and pork, or chicken, turkey, beans, or tofu. Twice a week, make seafood the protein on your plate.

### 3 include whole grains

Aim to make at least half your grains whole grains. Look for the words "100% whole grain" or "100% whole wheat" on the food label. Whole grains provide more nutrients, like fiber, than refined grains.

### 4 don't forget the dairy

Pair your meal with a cup of fat-free or low-fat milk. They provide the same amount of calcium and other essential nutrients as whole milk, but less fat and calories. Don't drink milk? Try soymilk (soy beverage) as your beverage or include fat-free or low-fat yogurt in your meal.

### 5 avoid extra fat

Using heavy gravies or sauces will add fat and calories to otherwise healthy choices. For example, steamed broccoli is great, but avoid topping it with cheese sauce. Try other options, like a sprinkling of low-fat parmesan cheese or a squeeze of lemon.

### 6 take your time

Savor your food. Eat slowly, enjoy the taste and textures, and pay attention to how you feel. Be mindful. Eating very quickly may cause you to eat too much.

### 7 use a smaller plate

Use a smaller plate at meals to help with portion control. That way you can finish your entire plate and feel satisfied without overeating.

### 8 take control of your food

Eat at home more often so you know exactly what you are eating. If you eat out, check and compare the nutrition information. Choose healthier options such as baked instead of fried.

### 9 try new foods

Keep it interesting by picking out new foods you've never tried before, like mango, lentils, or kale. You may find a new favorite! Trade fun and tasty recipes with friends or find them online.

### 10 satisfy your sweet tooth in a healthy way

Indulge in a naturally sweet dessert dish—fruit! Serve a fresh fruit cocktail or a fruit parfait made with yogurt. For a hot dessert, bake apples and top with cinnamon.

USDA United States Department of Agriculture
Center for Nutrition Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.

DG TipSheet No. 7
June 2011
USDA is an equal opportunity provider and employer.

10 tips
Nutrition Education Series

# be food safe

## 10 tips to reduce the risk of foodborne illness


A critical part of healthy eating is keeping foods safe. Individuals in their own homes can reduce contaminants and keep food safe to eat by following safe food handling practices. Four basic food safety principles work together to reduce the risk of foodborne illness—Clean, Separate, Cook, and Chill. These four principles are the cornerstones of Fight BAC!®, a national public education campaign to promote food safety to consumers and educate them on how to handle and prepare food safely.

## CLEAN

### 1 wash hands with soap and water

Wet hands with clean running water and apply soap. Use warm water if it is available. Rub hands together to make a lather and scrub all parts of the hand for 20 seconds. Rinse hands thoroughly and dry using a clean paper towel. If possible, use a paper towel to turn off the faucet.

### 2 sanitize surfaces

Surfaces should be washed with hot, soapy water. A solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of water can be used to sanitize surfaces.

### 3 clean sweep refrigerated foods once a week

At least once a week, throw out refrigerated foods that should no longer be eaten. Cooked leftovers should be discarded after 4 days; raw poultry and ground meats, 1 to 2 days.

### 4 keep appliances clean

Clean the inside and the outside of appliances. Pay particular attention to buttons and handles where cross-contamination to hands can occur.

### 5 rinse produce

Rinse fresh vegetables and fruits under running water just before eating, cutting, or cooking. Even if you plan to peel or cut the produce before eating, it is important to thoroughly rinse it first to prevent microbes from transferring from the outside to the inside of the produce.

## SEPARATE

### 6 separate foods when shopping

Place raw seafood, meat, and poultry in plastic bags. Store them below ready to eat foods in your refrigerator.

### 7 separate foods when preparing and serving

Always use a clean cutting board for fresh produce and a separate one for raw seafood, meat, and poultry. Never place cooked food back on the same plate or cutting board that previously held raw food.

## COOK AND CHILL

### 8 use a food thermometer when cooking

A food thermometer should be used to ensure that food is safely cooked and that cooked food is held at safe temperatures until eaten.

### 9 cook food to safe internal temperatures

One effective way to prevent illness is to check the internal temperature of seafood, meat, poultry, and egg dishes. Cook all raw beef, pork, lamb, and veal steaks, chops, and roasts to a safe minimum internal temperature of 145 °F. For safety and quality, allow meat to rest for at least 3 minutes before carving or eating. Cook all raw ground beef, pork, lamb, and veal to an internal temperature of 160 °F. Cook all poultry, including ground turkey and chicken, to an internal temperature of 165 °F (www.isitdoneyet.gov).

### 10 keep foods at safe temperatures

Hold cold foods at 40 °F or below. Keep hot foods at 140 °F or above. Foods are no longer safe to eat when they have been in the danger zone between 40-140 °F for more than 2 hours (1 hour if the temperature was above 90 °F).

USDA United States Department of Agriculture
Center for Nutrition Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.
Go to www.fsis.usda.gov for food safety information.

DG TipSheet No. 23
October 2012

## Session 2 – Chef #1 – Pancakes, Scrambled Eggs, and Strawberries

Ingredients & Materials:

- Bisquick Shake n' Pour Pancake Mix
  - Pan and spatula to cook pancakes
- Butter
- Syrup
- 6 Eggs
  - Bowl to scramble eggs
  - Fork to scramble eggs
  - Pan and spatula to cook eggs
  - Bowl to serve eggs
- Fresh Strawberries
  - Bowl to serve strawberries
  - Knife to cut strawberries
- Milk and water served with meal

Instructions:

- Bisquick Shake n' Pour Pancake Mix
  - Follow directions on package –water needed to add to mix
    - Heat pan
    - Melt butter in pan
    - Cook pancakes
- 6 Eggs
  - Crack and whisk with fork
    - Heat pan
    - Melt butter in pan
    - Scramble eggs
- Fresh Strawberries
  - Wash and slice
    - Place in bowl

Kitchen Rules:

- Washing hands
- Cup measurements (1/4, 1/3, 1/2, 1)
- Working with a hot stove
- Cleaning cooking surfaces

Social Rules:

- Asking to pass food-passed from one person to the next
- Giving compliments to the chef
- Saying “no thank you” if you do not want food or if you do not like food
- Not saying “that’s gross” or “I don’t like that” or “ew” to foods
- Setting up a table, napkin in lap
- Pouring drinks for others, using names!

## Session 3 – Chef #2 – Pizza, Corn, and Green peas

Ingredients and Materials:

- Pizza
  - Pre-made Pizza Crusts
  - Mozzarella Cheese
  - Pepperoni Slices
  - Can of Cooked Mushrooms
  - Pizza Sauce
    - Pans for baking pizza
    - Spoon to spread pizza sauce
    - Platter to serve pizza
- Canned Corn Kernels
    - Can opener
    - Bowl to microwave and serve corn
- Bag of Frozen Green Peas
    - 1/4 cup measuring cup for water

Bowl to microwave and serve peas

Milk and water served with meal

Instructions:

Pizza

Decide on toppings for two pizzas

Assign small groups to spread the sauce, sprinkle the cheese, and place the toppings

Place pizza in oven at 450 degrees for 10 minutes

Allow to cool and have an adult slice the pizza

Corn

Open can

Pour into bowl and microwave for 3 minutes

Green Peas

Open package

Pour into bowl with 1/4 cup water

Cover and microwave for 5 minutes

Kitchen Rules:

Washing hands

Cup measurements (1/4 cup)

Working with a hot oven (turn on, oven mitts, turn off)

Cleaning cooking surfaces

Using gloves and not touching face or other surfaces

Social Rules:

The Head Chef chose to serve the pizza rather than passing the platter

Go around the table and ask everyone which type they want and place on their plate

Head chef tells friends to self-serve peas and corn

If want more than one slice of pizza, the social rule is to wait for everyone at the table to get a slice before getting seconds

If last slice of pizza, ask everyone if it is alright to eat the last one

No talking with mouth full

Waiting for everyone to have a slice of pizza before eating/digging in

Appropriate time for conversation and jokes

Taking turns with dinner conversation and jokes

Thanking the chef for dinner

Helping set the table while the chef is preparing the food

Sous chef helps the head chef

Asking to pass the food instead of reaching across the table

Conversation cards used while waiting on chefs to cook and prepare dinner

Notes:

Teens may be afraid to work with oven and pull food out of the oven

## Session 4 – Chef #3 – California roll Sushi

Ingredients & Materials

Cucumber

Imitation Crab Sticks

Avocado

Knife to Slice Vegetables, Crab Sticks, and finished Sushi Rolls

Rice Vinegar

Bowl to mix Rice and Rice Vinegar

Sushi Rice (4 cups cooked = 2 cups uncooked)

Rice Cooker

Seaweed Sheets (Nori)

Bamboo Sushi Mat wrapped in Plastic Wrap

Chopsticks and Soy Sauce to eat Sushi Rolls

Instructions:

Cook rice in rice cooker and allow to cool to room temperature

Stir in rice vinegar when cooled

Rinse cucumber, avocado, and crab meat

Slice vegetables and crab meet to strips

Wrap bamboo sushi mat with plastic wrap

Place seaweed on sushi mat

Spread a thin layer of rice on seaweed

Sprinkle sesame seeds on rice

Flip seaweed and rice over

Place a row of cucumber, avocado, and crab meet in one row across the middle of the seaweed

Roll sushi and tighten with mat

Slice rolls and serve

Milk and Water served with meal

Kitchen Rules:

Washing Hands and wearing gloves

Rinsing vegetables prior to preparation

Handling sharp knives & adult supervision

Creating a clean working space when handling sharp knives

Using a rice cooker

Social Rules:

Allowing friends to help prepare food

Being flexible with different choices of what to include in individual sushi rolls

Waiting until everyone is ready to eat

Thanking the host/chef

Asking the chef for more or extra rice

## Session 5 – Chef #4 –popcorn chicken and oranges

Ingredients & Materials:

Oranges

Bread Crumbs

Salt & Pepper

2 Eggs

Olive Oil

8 Strips Raw Chicken Tenderloins

Bowl for Whisked Eggs

Bowl for Bread Crumbs

Cutting Board and Knife for Chicken

Pan for cooking chicken

Tongs to flip chicken and serve

Instructions:

Peel oranges and set aside in a serving bowl

Whisk 2 eggs in a bowl, set aside

Mix bread crumbs, salt, and pepper, then set aside

Cut chicken into 1 inch pieces

Dip chicken pieces into eggs and then dip into bread crumbs

Place on hot pan with oil over medium heat

Allow chicken to brown on one side, flip them to the other side, and allow to brown

Once brown on both sides, place on a plate with paper towels to soak up oil

If there are too many crumbs in the pan, then scoop them into a separate bowl to throw away when cooled

Serve chicken with peeled oranges

Kitchen Rules:

Washing Hands and wearing gloves

Handling sharp knives & adult supervision

Creating a clean working space when handling sharp knives

Safety when using a hot pan with oil

Social Rules:

Allowing friends to help prepare food

Being flexible when friends do not want to touch raw chicken and when they want different dips

Waiting until everyone is ready to eat

Not digging into food with hands

Using serving spoons when serving food and not hands or own eating utensils

How to ask friends how much they want when serving and politely controlling the portions if they ask for too much

Paying attention to the head chef when being served and holding the plate sturdily when being served

Thanking the host/chef

Ask the head chef what he would like to drink with his meal if he is busy

Asking for more water or milk

Asking the chef for more

Politely refusing food if not interested

Helping the head chef clean the table, counters, stove, and load the dishwasher

## Session 6 – Chef #5 – dorito chip casserole

Ingredients & Materials:

2 lbs. Hamburger Meat

Frying pan and spatula to brown the meat

Strainer to separate the meat from the grease

1 can of Chili Beans

1 can of Cream of Chicken Soup

1 can Rotel Tomatoes with Green Chiles

2 Cups of Shredded Cheddar Cheese

14 oz. Bag of Nacho Cheese Dorito Chips

9 X 12 baking pan to cook casserole

Instructions:

Preheat the oven to 350 degrees

Brown the meat, drain the fat using a strainer, and set aside

Crush the chips by opening the chip bag and squishing the sides of the bag together

Open all canned ingredients

Layer half of the chips along the bottom of the baking pan

Layer the meat right on top of the chips

Pour the chile beans as one layer on top

Pour the creamed soup on top of the beans

Layer the Rotel tomatoes on top of the soup

Sprinkle the rest of the Dorito chips on top

Sprinkle the shredded cheddar cheese on the very top

Bake the casserole at 350 degrees until the cheese is melted and casserole is warm

Kitchen Rules:

Handling raw meat and washing hands

Wearing gloves when handling food served to others

Altering part of the recipe for friends who are vegetarians

Handling a hot stove and hot oven (using oven mitts)

Learning to layer foods and why we use the can of condensed soup

Social Rules:

Keeping to self if do not like parts of the dish

Being considerate of people who need food accommodations (vegetarians, gluten-free, etc.)

Politely asking the chef for more milk or more food

Do not force food on everyone-understand that everyone may not like a part of the casserole

## Session 7 – Chef #6 – baked fish on bed of rice, Salsa Topping, and fried pickles

Ingredients & Materials:

Package of Frozen Fried Pickles

Baking pan to bake friend pickles

Jar of Salsa

Package of Frozen Fish

Baking pan for baking fish

Ready to Cook Rice

Pot to boil water for rice

Instructions:

Preheat the oven to 350 degrees (or what the package for the frozen fish says)

Boil a pot of water on high on the stove

Lay the friend pickles in a single layer on one pan

Lay the frozen fish in a single layer on the other pan

Place both pans in the oven at the same time

Keep the time for each pan

Take each pan out of the oven as they have completed their cooking time

When the water on the stove is boiling (bubbling vigorously), then place the packages of rice in the water. Follow the instructions on the package to cook the rice. Once done cooking, drain the rice and add it to a bowl. Add butter and salt, then stir the rice.

Ask friends to bring their plate up one at a time. Lay a small portion of rice on the plate, place a piece of fish on top, and lay some fried pickles on the side.

Place the salsa with a spoon to serve on the table for friends to place on top of the fish if desired

Place hot sauce and ketchup on the table for friends to use with food

Kitchen Rules:

Wash hands and use gloves when preparing food

Wear oven mitts when working with hot oven

Be careful with draining boiling water

Make sure to help clean the table, stove, counter tops, and dishes

Social Rules:

Politely refuse food if do not want to eat it

Alternatively, accept a small portion and do not eat it

Understand that it is not nice to make negative comments about the food (smells nasty, looks gross, or say it tastes better in a restaurant)

## Session 8 – Chef #7 – quesadillas and sliced strawberries

Ingredients & Materials:

- Small flour tortillas
- Mexican Cheese
- 1 can of Refried Beans
- 1 jar of Salsa
- Hot sauce
- Butter
    - Pan & Spatula to cook tortillas
- Strawberries
    - Knife to slice
    - Bowl to serve

Instructions:

- Heat pan on medium heat on the stove
- Place a spoon of butter in pan
- Place tortilla on the pan and top with cheese
- Place the second tortilla on top of the cheese
- Allow to heat through (about 1-2 minutes)
- Flip the whole quesadilla to heat the 2nd tortilla (about 1-2 more minutes)
- Set aside on plate and allow to cool
- Once all quesadillas are cooked, then slice quesadillas into small triangles
- Wash and slice strawberries, then place into bowl to serve

Kitchen Rules:

- Wash hands and use gloves when preparing food for other people
- Be careful for hot pans and hot stove taps
- Turn off stove when finished

Social Rules:

- Ask guests how many slices of quesadillas they wish to have
- Compliment and thank the chef

Help serve friends drinks before serving food

Help the host clean (table top, counter tops, stove top, pans and utensils, and dishwasher)

## Session 9 – Group Cook – Spaghetti and meatballs, sliced bananas

Ingredients & Materials:

1 package of Spaghetti Noodles

1 jar of Spaghetti Sauce

1 pot for boiling water to cook noodles and mix sauce in

1 strainer for noodles

1 package of Frozen Meatballs

1 sheet pan to bake meatballs

1 package of Parmesan Cheese

Bowl to serve

Instructions to cook spaghetti noodles with sauce:

Fill a pot halfway with water and place on high heat to boil

Once the water begins to bubble, add noodles and reduce heat to medium

Allow the noodles to simmer on medium heat for as long as the package says

Once noodles are cooked, turn off the heat, and pour into a strainer in the sink

If you are unable to pour the pot, then ask an adult for help

Place noodles back in the pot and mix the spaghetti sauce into it

Instructions to cook meatballs:

Preheat oven according to the directions on package of meatballs

Place meatballs on a baking sheet

Once the oven is preheated, bake the meatballs for as long as the package says

Once cooked, pull meatballs out of the oven and allow it to sit until you are ready to eat them with spaghetti

Kitchen Rules:

Wash hands and use gloves when preparing food for other people

Be careful for hot pots, hot pans, and hot stove tops

Use oven mitts for hot pans from the oven

Turn off oven and stove when finished

Social Rules:

Ask guests if they would like meatballs

Compliment and thank the chef

Help serve friends drinks before serving food

Help the host clean (table top, counter tops, stove top, pans and utensils, and dishwasher)

Pass the cheese around the table

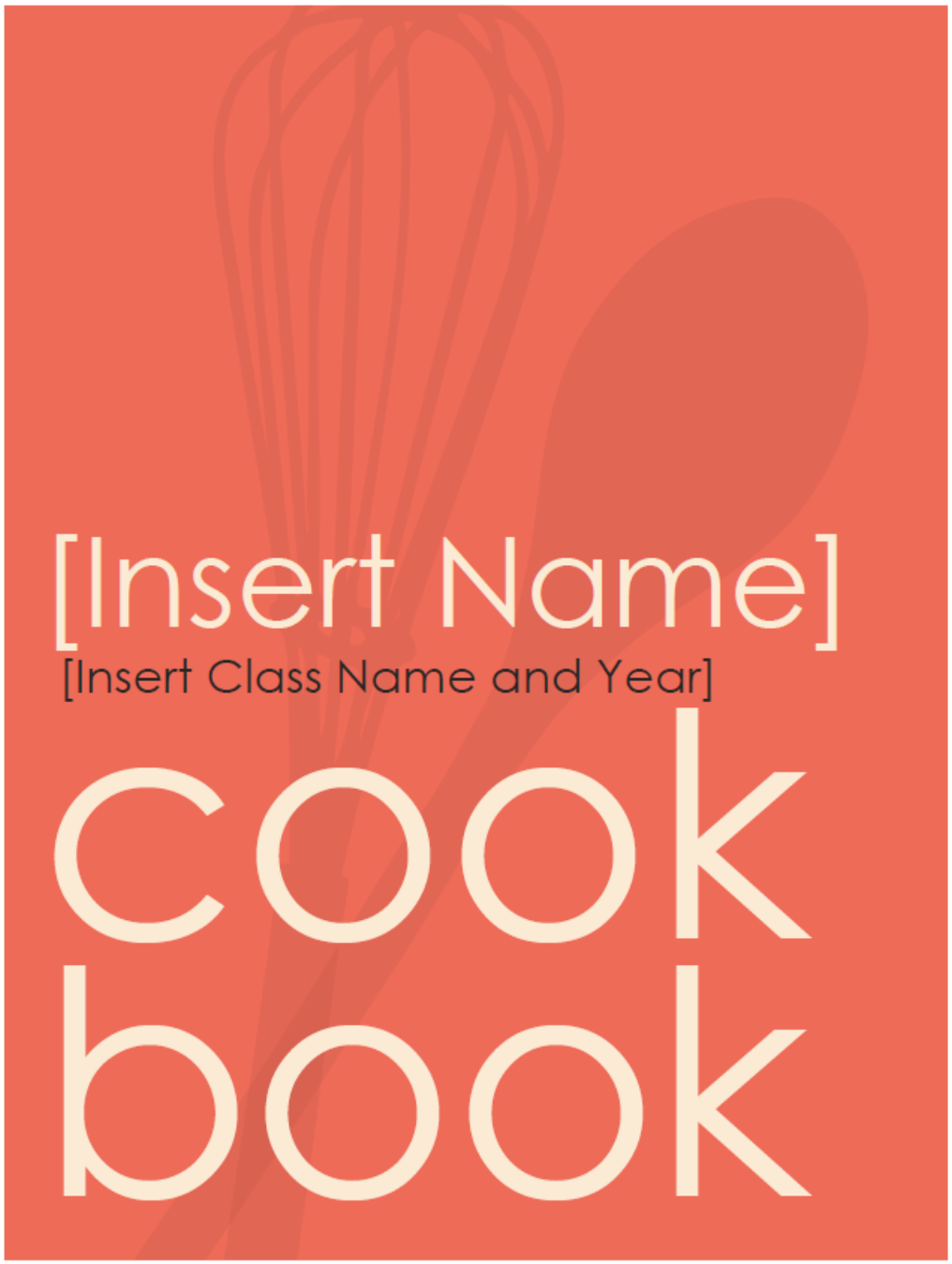
Reflection:

To conclude the cooking class, have all teens participate in small parts of this recipe.

Encourage conversation about the food, the class, and what they remember from the cooking sessions throughout the program.

# APPENDIX C

## EXAMPLE OF RECIPE BOOK FOR ADOLESCENT PARTICIPANTS


[Insert Name]
[Insert Class Name and Year]
cook
book

# Recipes

3

# Kitchen rules

1. Remember to ***ask for adult help*** or supervision when using sharp knives
2. ***Tell an adult*** if you plan to cook on a hot stove or hot oven
3. ***Read cooking instructions carefully*** before starting to prepare food
4. ***Wear gloves*** when preparing and cooking food for other people
5. Always ***wash your hands*** when beginning to cook and after handling raw meat
6. ***Wear oven mitts*** when putting food in a hot oven and taking food out
7. ***Clean*** the dining table and all cooking surfaces when you are done

[insert picture of adolescents and kitchen rules]

[insert picture of adolescents and kitchen rules]


**TABLE 1-1**
**COMMON ABBREVIATIONS**

| ABBREVIATION | = | MEASUREMENT |
|---|---|---|
| t. or tsp. | = | teaspoon |
| T. or Tbsp. | = | tablespoon |
| c. | = | cup |
| pt. | = | pint |
| qt. | = | quart |
| oz. | = | ounce |
| lb. | = | pound |
| pkg. | = | package |

4

# How to Use an Oven

1. Preheat oven to recommended temperature
2. Open oven door with oven mitts
3. Place food on oven rack
4. Use the tips of your mitt to push it into the middle of the rack, close the oven door
5. When done cooking, open oven door with oven mitts
6. Pull rack part-way out of the oven
7. Get the food out of the oven and place it somewhere people will not easily touch
8. Using mitts, push rack back into oven and close oven door
9. Do not forget to turn oven off
10. Always ask for an adult to help or supervise

[insert picture of adolescents using the oven correctly in sequential order]

[insert picture of adolescents using the oven correctly in sequential order]

[insert picture of adolescents using the oven correctly in sequential order]

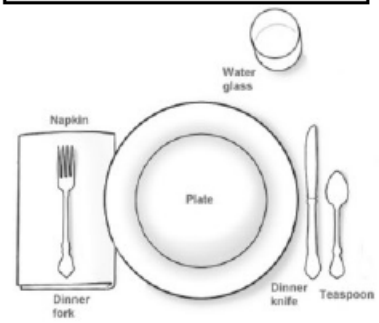
[insert picture of adolescents using the oven correctly in sequential order]

# Mealtime rules

1. Ask people to ***pass food*** that is out of reach
2. Say ***"no thank you"*** if you do not want to eat some of the food
3. Remember to put your ***napkin*** in your lap
4. Help your host ***set the table*** if they are busy cooking for you
5. ***Do not talk with your mouth full*** of food
6. ***Wait*** for everyone at the table to finish getting food before you start eating
7. Only talk about ***appropriate topics and jokes*** when eating
8. Use ***serving spoons*** to put food on your plate
9. ***Help the host clean*** the table, dishes, and countertops when finished eating
10. ***Compliment*** or ***thank*** the chef for their food

5

[insert picture of adolescents using mealtime rules]




[insert picture of adolescents using mealtime rules]

[insert picture of adolescents using mealtime rules]

5

6

# Pancakes & eggs
## With a bowl of Strawberries

A great idea for breakfast!

[insert picture of the adolescent that was the head chef of this meal; include pictures of ingredients used and equipment below; modify this example page as appropriate for each meal for your program]

| prep time | cook time | serves |
|---|---|---|
| 10 min. | 25 min. | About 6 |

### things you need

**Shake n' pour pancake mix**
1 container

**Syrup**
To eat with pancakes

**Butter**
To melt in pan to cook pancakes


**Fresh strawberries**
1 container to serve on the side

**6 Eggs**
Cracked in a bowl

**Milk**
To serve with breakfast

**Kitchen Equipment:**
Pan and spatula for pancakes
Bowl, fork/whisk, spatula for eggs
Bowl and knife for strawberries

# here's how to cook pancakes

1. Following directions on the pancake container to mix water into the pancake mix to make pancake batter.
2. Heat pan on medium heat and melt a tablespoon of butter in it
3. Once butter is melted, pour a small amount of the batter in the pan until you see the edges are cooked and small bubbles on the pancake
4. Flip the pancake with a spatula to cook the other side for 1 minute
5. Take it off the pan and place on a plate. Continue steps 1-5 until you cooked enough pancakes.

# here's how to cook eggs

1. Crack all 6 eggs in a bowl and scramble them with a fork or a whisk
2. Heat pan on medium heat and melt a tablespoon of butter in it
3. Pour eggs into pan and use a spatula to swirl them around the pan until they become cooked scrambled eggs, then serve in a bowl

# helpful notes

Wash and slice the strawberries. Leave them in a bowl on the table so your friends can add them to their pancakes if they wanted.

[insert picture of the meal cooked]

[insert picture of the adolescents sharing the meal]

[insert picture of the adolescents sharing the meal]

[insert picture of the adolescents sharing the meal]

8

# California Roll Sushi

A fun and exciting meal with family and friends :)

| prep time | cook time | serves |
|---|---|---|
| 20 min | 20 min | About 5 |

[insert picture of the adolescents who is head chef for this meal]

## things you need

**Sushi rice**
1 cup of uncooked rice

**1 Cucumber**

**1 Avocado**


**Crab sticks**
1 package

**Rice vinegar**
1 tablespoon

**Seaweed sheets (Nori)**
1 sheet per roll (5 sheets

**Kitchen Equipment:**
Sushi mat
Plastic wrap
Knife to cut rolls
Rice Cooker

[insert picture of the adolescents who is head chef for this meal] or the sous chefs

# here's how to prepare the food

1. Cook the 1 cup of rice ahead of time in a rice cooker. When it is done cooking, turn off the rice cooker to allow the rice to cool down
2. Once the rice is cooled down, stir the rice vinegar through the rice and set aside
3. Wash the cucumber, avocado, and cooked crab sticks (can be imitation), then slice all of them into long strips and set aside

# here's how to roll the sushi

1. Wrap the sushi mat with plastic wrap
2. Place a sheet of seaweed on it and spread enough rice on both sides of the seaweed
3. Place a strips of cucumber, avocado, and crab in a line across the seaweed
4. Roll the seaweed into a sushi roll and slice into smaller rolls to serve

[insert picture of the adolescents creating the meal or sharing the meal]

## *How to slice an avocado*

Cut in half

push seed out with spoon

slice green parts

scoop with spoon

10

# Spaghetti & Meatballs
# Bananas on the side

A great meal to have friends help!

cook time
30 min

## things you need

1 jar Spaghetti Sauce

Spaghetti noodles
1 12-16 ounce package

Frozen meatballs

Parmesan cheese


Milk
To serve with food

## Kitchen Equipment:
Baking pan for meatballs
Pot for cooking noodles
Strainer for draining noodles
Spaghetti spatula to serve

Bananas

[insert picture of the adolescents helping to create the meal]

# here's how to cook this meal



1. Fill the pot half way with water and place on high heat on the stove
2. Once water boils, place noodles in and cook for the time recommended on the package (may be 10 minutes). Once cooked, drain noodles in strainer (be careful for splashing).
3. Preheat oven according to meatball instructions
4. Place meatballs on the baking sheet and into the oven to cook
5. Bake the meatballs for the recommended time on the package
6. Place spaghetti sauce, cooked meatballs, and cooked noodles back into the big pot on low-medium heat on the stove until warm (about 7 minutes)
7. Ask friends to bring their bowl up and serve them, Give each friend a banana on the side.

[insert picture of adolescents helping create the meal or enjoying the meal]

[insert picture of adolescents helping create the meal or enjoying the meal]

# helpful notes

*Be careful when cooking with a hot stove, boiling water, and hot oven*

[insert picture of *all adolescents around the table enjoying the meal together*]


Happy cooking :)

# APPENDIX D

## SEMI-STRUCTURED INTERVIEW GUIDE FOR ADOLESCENT PARTICIPANTS

Interview Script for Adolescents

Introduction: Hi ____. We are going to talk about some foods you may like and some foods you may not like. We are only talking about the foods. You will not have to eat any food while we talk.

I am going to name different types of foods and see what you think about them.

Ask about different food groups and specific foods when necessary.

Do you have any questions so far?

If “yes”, then questions are addressed.

If “no”, then the adolescent is asked about the next food.

At post interview, ask “What did you learn in the cooking class?”

“What do you think is most important to learn in the cooking class?”

Ending the Interview: That’s all the foods we will talk about today. You did a great job! Do you have any questions before we end our session?

If “yes”, then questions are addressed.

If “no”, then the session is ended.

# APPENDIX E

# INTAKE FORM FOR PARENTS

**Initial Intake Form** **Study ID#:** _____

Instructions: Please answer the following questions about your teen.

Food-related Allergies: _____

Food Restrictions (e.g., gluten-free diet, etc.): _____

Age of parent/legal guardian: _____

Child's Birthdate: _____

Weight: _____

Height: _____

Diagnosed with an ASD: Yes or No

Any other disorders or illness that may affect your teen's appetite (e.g., gastrointestinal issues, ADHD medications, etc.): _____

Would you say your teen is a picky-eater? Yes No

Received any feeding interventions? Yes No

How many times do *you cook* a meal per week: _____

How many times does your *teen cook* per week: _____

How many meals were in assistance to the family: _____

How many meals were independent (for themselves): _____

How many times a week do you go out to eat with your teen? _____

How many times was it in a sit-down restaurant: _____

How many times was it in a drive-through/take-out: _____

Choose how much physical activity does your teen get per week (e.g., exercising, sports, walking, etc.)

- ☐ Less than 30 minutes per week
- ☐ 30 minutes per week
- ☐ 1 hour minutes per week
- ☐ 1.5 hours per week
- ☐ 2 hours per week
- ☐ 3 hours per week
- ☐ 4 hours per week
- ☐ 5 hours per week
- ☐ 6 hours per week
- ☐ 7 hours per week
- ☐ More than 7 hours per week

# APPPENDIX F

## SEMI-STRUCTURED INTERVIEW GUIDE FOR TEACHERS AT FOLLOW-UP

# Interview Guide

Information sheet reviewed with teacher and teacher agreed to participate: Yes or No

"First, I would like to thank you for agreeing to participate in this interview. The purpose of this interview is to ask the teachers who took part in the social-skills focused cooking class about their thoughts and perceptions throughout the program. Let's start with a few questions."

1. Can you tell me your thoughts about the purpose of the cooking class? What were some of the things you hoped to achieve with this class?

2. How was the experience of teaching the class for you?

3. Can you tell me about the students in the class?

4. What do you think students got out of the class? How was the experience for them?

    a. What do you think the teenagers liked about the class?

    b. What do you think the teenagers disliked about the class?

    c. How did this differ for different types of teenagers?

5. Have you observed any changes in the teenagers as a result of the class?

    a. Can you tell me about any changes in eating behaviors as a result of the cooking class?

        i. Acceptability or selectivity of food?

    b. Can you tell me about any changes in social skills as a result of the cooking class?

i. Social skills around eating and mealtime?

c. Can you tell me about any changes in their adaptive skills, such as self-help skills as a result of the cooking class?

i. Feeding/cooking themselves?

ii. Kitchen safety skills?

iii. Planning ahead?

6. How do you think parents felt about this class?

a. What kind of feedback did you get from parents?

b. How do you think they were affected by having their child learn about cooking and social skills around mealtime?

i. Parent feeding styles?

7. Do you think parents observed any changes in their teenager as a result of the class?

a. Can you tell me about any specific cases (without mentioning names or any identifying information)?

b. Can you tell me about any parenting stress or changes you observed throughout the program?

8. What do you think could make the class better? How would you change it if you were going to do it again?

9. Is there anything else you would like to say about the cooking class?

10. Can you talk about any other types of interventions or programs that you think would be helpful to achieve the goals of this cooking class in this population?

"This concludes our interview. Thank you for your time."