



Exploratory Investigation of the Roles, Responsibilities, and
Impact of Chefs Working in School Nutrition Programs

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Exploratory Investigation of the Roles, Responsibilities, and Impact of Chefs Working in School Nutrition Programs

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TABLE OF CONTENTS

| | |
|--|----|
| EXECUTIVE SUMMARY | 7 |
| INTRODUCTION | 9 |
| METHODOLOGY | 12 |
| Research Design..... | 12 |
| Phase I: Case Study Site Visits | 12 |
| Phase II: Expert Panel Work Group..... | 13 |
| Expert Panel Work Group..... | 14 |
| Phase III: National Survey | 15 |
| Informed Consent..... | 15 |
| Data Analysis | 16 |
| RESULTS | 17 |
| Phase 1: School Site Visit Interviews | 17 |
| Hiring Practices..... | 18 |
| Job Duties..... | 21 |
| Training..... | 23 |
| Impact on School Nutrition Programs and Operations | 26 |
| Phase II..... | 29 |
| National Survey: Pilot Study | 32 |
| CONCLUSIONS..... | 66 |
| Recruiting, Hiring, and Retaining Chefs..... | 66 |
| Required and Preferred Qualifications for Hiring..... | 66 |
| Benefits and Challenges of Hiring a Chef | 68 |
| Job Duties and Responsibilities | 69 |
| Training..... | 69 |
| Chef Success in School Nutrition Programs | 69 |

| | |
|--|----|
| Impact of a Chef on Meal Quality Attributes and Program Operations | 70 |
| RECOMMENDATIONS | 72 |
| REFERENCES | 73 |

LIST OF TABLES

| | |
|---|----|
| Table 1: Summary of Participants by Job Title | 17 |
| Table 2: Data Matrix for Chef Hiring Practice Interview Questions..... | 19 |
| Table 3: Quotes Illustrating Themes for Hiring Practices | 20 |
| Table 4: Data Matrix for Chef Job Duties Interview Questions | 22 |
| Table 5: Quotes Illustrating Themes for Job Duties | 22 |
| Table 6: Data Matrix for Training Interview Questions | 24 |
| Table 7: Quotes Illustrating Themes for Trainings..... | 25 |
| Table 8: Data Matrix for Specific Impacts of Chef on SN Programs and Operations Interview Questions..... | 28 |
| Table 9: Demographic Characteristics of Pilot Sample..... | 33 |
| Table 10: Frequencies on Chef Survey Evaluation Form..... | 34 |
| Table 11: Personal and Program Characteristics by Chef/SN Management | 38 |
| Table 12: Recruiting and Hiring Chefs..... | 42 |
| Table 13: Recruiting and Hiring Chefs (Directors Only n=95) | 43 |
| Table 14: Chef Qualifications (Directors Only n=95) | 44 |
| Table 15: Reasons for Hiring Chefs..... | 46 |
| Table 16: Challenges of Hiring Chefs | 48 |
| Table 17: What Attracted You, As a Chef, to the SNP?..... | 49 |
| Table 18: Frequency of Turnover | 49 |
| Table 19: Factors that Influenced Chef Turnover Rate | 50 |
| Table 20: Job Duties and Responsibilities..... | 51 |
| Table 21: Duties Performed by Chef in SNP..... | 54 |
| Table 22: School Nutrition Program Training for Chefs Prior to Being Hired | 57 |
| Table 23: School Nutrition Program Training for Chefs AFTER Being Hired..... | 58 |
| Table 24: Importance of School Nutrition Program Training for Chefs | 59 |
| Table 25: Importance of Chef Success in SNPs | 60 |
| Table 26: Impact of Chefs Working in SNPs on Meal Quality Attributes | 62 |
| Table 27: Impact of Chefs Working in SNPs on Program Operations and Activities..... | 63 |

EXPLORATORY INVESTIGATION OF THE ROLES, RESPONSIBILITIES, AND IMPACT OF CHEFS WORKING IN SCHOOL NUTRITION PROGRAMS

EXECUTIVE SUMMARY

The Institute of Child Nutrition's (ICN), Applied Research Division (ARD) has been at the forefront of identifying the competencies, knowledge, and skills needed by professionals working in Child Nutrition Programs (CNP). Through a framework called the Model for Developing Competent Performance, ICN, ARD researchers can provide CNP administrators with a research-based mechanism to identify qualified staff, recommend training, and support performance evaluations. Consequently, the purpose of this study was to explore the role and impact of a chef on the school nutrition program's (SNP) operations.

To accomplish the research objectives, the researcher used a multi-phased research approach. In Phase I, the study utilized a holistic, multiple-case study design during visits to six school districts in six states, representing five United States Department of Agriculture, Food and Nutrition (USDA, FNS) regions. Data was collected in this phase to inform the development of the project's survey instrument for Phase II. In Phase II of the project, the researcher utilized an expert panel of 16 school nutrition (SN) professionals to develop and evaluate a survey instrument. For the final phase, Phase III, a national survey was conducted to address the study's purpose and objectives.

Some of the key study findings in this study are listed below.

1. School nutrition management agree that while there are benefits to hiring a chef including (a) "chefs enhance the reputation and public perceptions of SNPs" ($M = 4.34$, $SD = 0.95$); (b) "chefs enhance the food quality of school meals and recipes" ($M = 4.25$, $SD = 0.90$); and (c) "chefs develop creative and innovative school menus" ($M = 4.22$, $SD = 0.93$), there are also some challenges to identifying qualified chefs. The most significant challenges an SNP faces when trying to hire a chef are (a) "lack of knowledge related to USDA meal planning requirements for SNPs" (72%), (b) "lack of funds to support a chef position" (69%), and (c) "lack of awareness of SNP career opportunities" (55%).
2. Before being hired in an SNP, SN management and SN chefs agreed that chefs have little training in school meal program administration (17.4% SN management and 22.7% chefs), SN policy (21.1% SN management and 28.8% chefs), meal patterns for SNPs (22.8% SN management and 25.8% chefs), and USDA Foods (25.6% SN management and 27.3% chefs).
3. The characteristics, qualities, and traits needed for chefs to succeed in SNP operations are similar to those required to succeed in the hospitality industry. These characteristics include (a) "ability to work with diverse groups of people" ($M = 4.84$, $SD = 0.46$ SN management and $M = 4.80$, $SD = 0.50$ chefs); (b) "shows respect for others" ($M = 4.81$, $SD = 0.56$ SN management and $M = 4.84$, $SD = 0.50$ chefs); (c) "maintains a positive attitude in the work environment" ($M = 4.81$, $SD = 0.48$ SN management and

- M = 4.77, SD = 0.52 chefs); and (d) “maintains a commitment to quality food service” (M = 4.78, SD = 0.54 SN management and M = 4.88, SD = 0.40 chefs).
4. Both chefs and SN administrators agree that chefs have a positive impact on meal quality attributes, including (a) “food taste” (M = 4.79, SD = 0.43 SN management and M = 4.86, SD = 0.36 for chefs); (b) “food quality” (M = 4.79, SD = 0.47 SN management and M = 4.77, SD = 0.46 for chefs); (c) “menu variety/variety of offerings” (M = 4.68, SD = 0.54 SN management and M = 4.75, SD = 0.50 for chefs); and (d) “food freshness” (M = 4.64, SD = 0.59 SN management and M = 4.70, SD = 0.58 for chefs).
 5. Both chefs and SN administrators agree that chefs have a positive impact on program operations, including (a) “cross utilization of current and new ingredients” (M = 4.49, SD = 0.68 SN management and M = 4.47, SD = 0.74 for chefs); (b) “SN staff culinary techniques” (M = 4.48, SD = 0.75 SN management and M = 4.54, SD = 0.70 for chefs); (c) “customer service” (M = 4.40, SD = 0.73 SN management and M = 4.42, SD = 0.74 for chefs); (d) “safety and sanitation” (M = 4.39, SD = 0.77 SN management and M = 4.54, SD = 0.70 for chefs); and (e) “student participation in school lunch” (M = 4.39, SD = 0.64 SN management and M = 4.41, SD = 0.67 for chefs).

The outcomes of this research indicate there is significant agreement between the perceptions of SN administrators and SN chefs on the role, job duties and responsibilities, and impact of a chef on SNP operations. The information gained from this study will be an essential resource to assist ICN, USDA, State agencies, and culinary program directors in developing the appropriate recruitment tools, training resources, mentoring opportunities, professional development opportunities, and performance assessments that attract and retain chefs in SNP operations.

INTRODUCTION

Child Nutrition Programs (CNP), which are regulated by the United States Department of Agriculture (USDA), provide opportunities for children to have access to healthy meals and snacks and nutrition education. In particular, the reach of the National School Lunch Program (NSLP) and School Breakfast Program (SBP) can be felt across the country, as these programs serve millions of students annually. According to recent USDA data, approximately 29.4 million children were served school lunches each day. Nearly 100,000 schools and/or institutions served school lunches in the United States (US) in the fiscal year 2019 (*National School Lunch Program*, n.d.). Furthermore, 14.7 million students participated in the SBP in nearly 90,000 schools across the US (*School Meal Trends & Stats*, n.d.; *School Breakfast Program Participation*, n.d.). These programs, the NSLP and the SBP, are required to meet specific nutrition standards through a Congressional mandate called the Healthy, Hunger-Free Kids Act of 2010 (HHFKA). As a result of the HHFKA of 2010, school meal standards shifted to address, in part, increasing meal reimbursements to schools participating in NSLP and SBP, increasing fruit and vegetable availability and consumption, increasing the availability and consumption of whole grains, and decreasing the consumption of sodium and *trans* fats (Cohen, Richardson, & Rimm, 2019; National Conference of State Legislatures, 2011; Schwartz & Wootan, 2019).

In early 2010, while the momentum of the HHFKA was forging ahead, former First Lady Michelle Obama started an initiative to address the issue of childhood obesity facing the US. This campaign was called *Let's Move*. It was a comprehensive, multifaceted program that energized public and private sectors to address childhood obesity (The White House, Office of the First Lady, 2010). One component of the *Let's Move* campaign was the *Chefs Move to Schools* program. The *Chefs Move to Schools* program's aim was to partner chefs with local school food authorities (SFA) to form a collaboration for (a) creating healthy meals that met the HHFKA of 2010 meal pattern standards, (b) offering meals that fit within the school nutrition program's (SNP) budget, and (c) providing nutrition education to students (*A Chef's Guide*, n.d.). During the program's height, chefs were encouraged to volunteer their time and culinary expertise to work with schools to create healthy, student-approved menus, train school kitchen staff to prepare recipes from scratch, and generate excitement around healthy school meals. The program was individualized based on each chef volunteer's interests and expertise and the needs of each school. The *Chefs Move to Schools* program galvanized chefs, and within two years of the program initiation, approximately 3,400 chefs and 3,350 schools across the US had agreed to be a part of the plan (School Nutrition Association, 2012).

As the *Chefs Move to Schools* program's popularity grew, the possibility of having a chef on staff in an SNP became more viable and attainable. However, as the Federal administration changed, so did the emphasis and direction of some Federal programs. Beyond the *Chefs Move to Schools* program, SFAs have continued to involve chefs in local SNPs in different capacities. While the chef's role may differ from school to school, the mission of feeding children nutritious meals at school remained the impetus of each program.

In general, literature that addresses the roles, duties, responsibilities, and impact of chefs on foodservice operations is limited. However, there has been an uptick in recent years. Much of the research conducted on chefs have addressed competencies for sustainable and successful

careers, turnover rates, job satisfaction, and innovation (Abdullah, et al., 2010; Allen, & Mac Con Iomaire, 2017; Birdir, & Pearson, 2000; Bissett, Cheng, & Brannan, 2009; Bissett, Cheng, & Brannan, 2010; Giousmpasoglou, Marinakou, & Cooper, 2016; Hu, 2010; Robinson, 2005; Suhairom, Musta'amal, Amin, Kamin, & Wahid, 2019; Zopiatis, 2010). While some of these studies were conducted in the US, many have been conducted in countries outside of the US (Abdullah et al., 2010; Allen, & Mac Con Iomaire, 2017; Giousmpasoglou et al., 2016; Hu, 2010; Robinson, 2005; Surhairom et al., 2019; Zopiatis, 2010).

Although research on chefs working with SNPs is underrepresented, there are a few studies that have been conducted to examine the impact of chefs in schools on menu planning, recipe development, student choices, and plate waste (Caraher, Seeley, Wu, & Lloyd, 2013; Cohen et al., 2012; Cohen et al, 2015; Cohen et al., 2019; Zellner & Cobuzzi, 2017). For example, Cohen et al. (2012) evaluated the impact of chef-enhanced meals on healthier school food selection and consumption. The results from their study showed that over two years, more students attending the Chef Initiative schools chose whole grain entrées or side dishes than students in the control school (85.7% versus 34.7%, $p = 0.02$). Students at the Chef Initiative schools ate significantly more side dishes and consumed significantly more servings of vegetables than students at the control schools. The study's outcome provides insight into the idea that a chef's influence on food quality, palatability, and variety may positively affect students' fruit and vegetable selection and consumption over time.

Since its inception in 1989, the Institute of Child Nutrition's (ICN), Applied Research Division (ARD) has been at the forefront in identifying the competencies, knowledge, and skills needed by professionals working in the child nutrition field. The ICN created a framework to identify the prerequisites required to have proficient work performance outcomes in CNPs. This framework is called the Model for Developing Competent Performance (Cater & Carr, 2006; Cater & Carr, 2007). The purpose of the Model for Developing Competent Performance is to provide supervisors with a mechanism to evaluate staff and to identify if one of three things was necessary:

1. The employee is performing at a competent level, and maintenance training is required.
2. The employee is performing at a competent level, and change-driven training is required; and
3. The employee is not performing at a competent level, and core training is required (Cater, & Carr 2006; Cater and Carr, 2007).

Historically, the ICN, ARD has worked to identify the prerequisites required to have proficient work performance outcomes for school nutrition (SN) directors, SN supervisors, and nutrition assistants/technicians. In recent times, the ICN, ARD has added competency, knowledge, and skills research for State agency child nutrition professionals and child care providers in Child and Adult Care Food Programs. Because the school chef is a burgeoning position in SNP infrastructure, identifying competencies, knowledge, and skills needed by chefs working in SNPs is critical. Taking this into account, the purpose of this study was to explore the role and impact of a chef on the SNP's operations from the perspectives of SN administrators, SN managers, and SN chefs.

The objectives of this project were as follows:

- Investigate and identify the job functions/functional areas that encompass the responsibilities of chefs working in SNPs.
- Identify the various roles, job descriptions, and job titles associated with chefs working in SNPs.
- Identify the educational attainment and employment backgrounds of chefs working in SNPs, as well as hiring requirements related to educational attainment and previous work experience.
- Identify SN directors' perceptions, preferences, and behaviors related to chefs working in SNPs.
- Identify the impact of chefs working in SNPs on school food quality, school food palatability, school food variety, and students' food consumption.
- Identify the perceived impact of chefs working in SNPs on school meals program participation, program finances, student engagement activities, food and nutrition education, and staff training; and
- Identify school chefs' knowledge, perceptions, and practices regarding their involvement in SNPs.

METHODOLOGY

Research Design

To accomplish aforementioned research objectives and goals, the researcher used case-study methodology and a national survey to explore the job duties and responsibilities of chefs working in SNPs, to identify perceptions and preferences working with and as an SN chef, and to identify the impact chefs have on SNP operations. This research project was conducted in three phases.

In Phase I, the study utilized the holistic, multi-case study research design that followed a replication format to collect data. This type of methodology can be used to explore the differences between and within schools with diverse populations (or cases) (Baxter & Jack, 2008; Yin, 2003). The replication protocols and instruments included in this research were structured interviews, direct observations, and documentation examination. In the first phase of the research project, the researcher visited six school districts in six states, representing five United States Department of Agriculture, Food and Nutrition (USDA, FNS) regions. The findings from Phase I were used to develop survey items to be assessed and evaluated in Phase II of the project.

Phase II of the project included an expert panel consisting of 16 SNP administrative staff, SNP chefs, State agency representatives, SN consultant chefs, and ICN representatives. This panel worked to develop and evaluate a survey instrument to be administered on a national level. The tool would assess job functions, job duties, educational attainment and work experience, education and work experience for hiring a chef, and perceptions and impact of chefs working in schools.

In the final phase of the project, Phase III, the researcher conducted a national survey on the roles, responsibilities, impact, and outcome of chefs working in SNPs. For this survey, SN directors, administrators, managers, State agency staff working with or as a chef, and chefs working in schools were the target audience.

Phase I: Case Study Site Visits

The first phase of this project included qualitative data collection through on-site visits. As a part of the site visit protocol, the researcher participated in job shadowing, behavioral observations, collecting supporting documents, and interviewing select SN staff. Six school districts (N = 6) representing small, urban, rural, and large city schools in five FNS regions across the country participated in Phase 1. Eligible participants were identified through structured interviews conducted with USDA, FNS; ICN staff; State agency professionals; and allied organization representatives. Additionally, eligible participants had to (a) exhibit willingness to allow ICN researchers to conduct the site visit by providing a written approval from SNP administration and (b) demonstrate the presence of a full-time, part-time, or voluntary chef(s) on staff. The number of interviews conducted during the site visits was based on the school district's organizational design. At a minimum, two SN staff were to be interviewed at

each school district. These case study site visits were conducted from October 2018 to February 2019.

To address the research objectives, the researcher observed the SNP chefs' daily activities during the job shadowing opportunities. During the observations, the researcher used a pre-established observation sheet to identify the SN chef's roles, duties, and responsibilities. The visits also included the collection of supporting documents and records, as appropriate.

Along with observations, the SN chefs, managers, directors, and/or administrators were interviewed to gain insight into the job duties and responsibilities of the SN chef from the perspective of the chef working in the SNP and SN administrative staff. The interviews were designed to (a) establish priorities related to current and forecasted job duties and responsibilities of SN chef; (b) identify and develop preliminary operational definitions associated with job duties and responsibilities of SN chef; and (c) determine the perceived impact of the SN chef on school food quality, school food palatability, food variety, consumption, student participation, program finances, student engagement activities, food and nutrition education, and staff training. The information obtained in Phase I was used to develop the focus group question schedule and the draft survey questions for Phase II.

Phase II: Expert Panel Work Group

Potential expert panel work group participants were recruited from a list of SN directors, SN assistant directors, SN chefs, and State agency professionals who work with SN programs identified in Phase I of the research project. The SN professionals on the list were considered experts in the field with experience working with a chef or as a chef in an SNP.

The researcher established a maximum sample size of 20 individuals to optimize discussions within the expert panel work group. A simple random sample of 24 SN professionals was invited to participate as expert panel participants. The SN professionals were sent a letter of invitation explaining the project and the purpose of the meeting. The letter also included contact information for the researcher. The potential panel members were invited to participate in a two-day expert panel work group meeting held in March of 2019 to accomplish the project's objectives. After invitees indicated their agreement to join as expert panel participants, confirmation letters were mailed electronically with additional information about the upcoming meeting and travel arrangements. A total of 16 SN professionals agreed to participate in the expert panel work group.

The expert panel work group meeting included four major segments: introduction, focus group discussion, testing the survey questions, and closure. The focus group discussion was comprised of a series of predetermined questions for the expert panel work group participants to respond to enhance the effectiveness of the development of the survey questions. As for testing the survey questions, the expert panel participants were asked to review and respond to draft questions and provide feedback on question clarity, appropriateness of the information presented, gaps in knowledge gathered, and format of the questions and answers. This phase of the process was conducted during and following the expert panel work group meeting.

Expert Panel Work Group

The expert panel work group meeting was facilitated by an ARD researcher, and involved a series of focus group discussions as the exploratory research technique to develop a national survey. Specifically, expert panel participants confirmed or refuted data collected during the site visits to schools across the United States. In addition, expert panel participants assisted in developing a national survey by pretesting the clarity and relevance of existing questions from a draft national survey, assessing evidence based on test content of a draft survey instrument, and identifying content gaps for the development of new questions. The process allowed panel members to come to a consensus on a survey instrument to pilot.

Expert panel participants were divided into two groups of eight people in order to optimize group discussion and to keep the group on task. Each group included representation from each sector invited (chefs, SN directors or assistant directors, SN management, and State agency representatives). Each group was led through a focus group type discussion related to each of the identified subgroups for the survey instrument: chefs' impact in SNP, job duties and responsibilities of chefs in SNPs, personal and program characteristics, recruiting and hiring a chef, and training chefs. An ARD researcher led the group discussion, and another ARD research staff member acted as a recorder for the group discussions. A formalized set of questions identified prior to the expert panel meeting were used to guide the focus group discussion. Each group worked independently to discuss the focus group questions. After each group completed the discussion on a specified survey topic area, both groups convened collectively to discuss and evaluate survey items related to the survey topic in which they had participated. This process was repeated for each survey instrument subgroup.

Following the expert panel work group meeting, the researcher used the survey summary assessment forms and the discussion notes to finalize the draft national survey. The initial draft survey document included six sections and 154 questions. The draft national survey was emailed to participants within three weeks of attending the expert panel work group meeting. The participants were asked to confirm the results of the work group recommendations. An attached survey allowed participants to evaluate each section of the national survey and indicate their level of agreement that the sections provided clear instructions, appropriate terminology, and accuracy pertained to the topic area. Panel members were also provided the opportunity to indicate if there were questions that should be added, deleted, or modified. The researcher established a 70% agreement as a required level of agreement to finalize any item additions, deletions, or modifications to the survey instrument. Additionally, any significant changes made to the survey based on the panel review were made at the researcher's discretion and supported by data from literature reviews.

During November 2019, the final version of the draft national survey was pilot tested with 30 SNP professionals, including directors, assistant directors, and chefs identified from Phase I of the project. Pilot test participants received a recruitment letter through email. The letter was followed with a hard copy of the pilot survey and a survey evaluation form. Participants were asked to evaluate the survey on readability, clarity, and the amount of time needed to respond to the survey. Participants responded with recommended changes in content to bring clarity to the wording on several questions or to eliminate redundancy. The respondents

also provided recommendations for omitted topics. The outcomes of the Phase II expert panel work group and the pilot test results guided the development of the final version of the national survey.

Phase III: National Survey

The third phase of the research project included distributing and analyzing the SNP chef's national survey. As with Phases I and II, all research objectives associated with this project were addressed in Phase III. Data collected in Phase II was used to create a final version of the national survey.

The national survey design included various assessment methods, including close-ended questions and open-ended questions. The survey was divided into seven domains or topic areas: personal and program characteristics, recruiting and hiring chefs, job duties and responsibilities, SN program training for chefs, chef success, impact of chefs working in SNPs on meal quality attributes, and impact of chefs working in SNPs on program operations and activities.

The national survey was mailed to a simple random sample of 510 SN staff (including directors, managers, and chefs) and State agency staff. The sample was identified through State agencies, members of the Culinary Institute of America's Healthy Kids Collaboration, participants in Phase I and Phase II of the research project, ICN education and training staff, and USDA, FNS staff. Furthermore, participant samples were purchased from Market Data Retrieval, a company that maintains current mailing addresses for kindergarten through 12th-grade school districts and schools. Within the mailing for the national survey, participants received a recruitment letter, the survey instrument, and a pre-paid, self-addressed stamped envelope. The data were collected over a two-month period in 2020.

Informed Consent

The researcher for this project followed consent procedures established by the Human Subjects Protection Review Committee at the University of Southern Mississippi. There were no identifying codes used to identify participants from either the site visits, expert panel work group, or the national survey in Phase I, Phase II, or Phase III of this study. In Phase I, each SN director, SN administrator, and chef that participated in the onsite structured interview signed a consent form indicating their willingness to participate in the study. In Phase II, acceptance of the invitation and written agreement to become a participant of the expert panel work group signified consent to participate in the study. In Phase III, individuals completing the national survey received correspondence with the survey, including a confidentiality statement and a notice that completing the survey was completely voluntary. Agreement to participate and the return of a completed survey served as consent to participate in the study. At each phase of the research project, all participants were provided contact information for the Human Subjects Protection Review Committee at The University of Southern Mississippi, Hattiesburg, MS.

Data Analysis

In Phase I, the information gathered from each case study was analyzed individually for pertinent data and themes. Each sector of the SNP workforce (i.e., directors, administrative staff, and chefs) interviewed during the site visits were asked similar questions to ensure triangulation of sources. Data were categorized, cross-case tabulated, and cross-checked to identify diverse roles and responsibilities, benefits, challenges, and impacts of chefs in SNPs. A cross-case analysis of the data was employed using the constant comparative method. The researcher coded the interview transcripts, and other researchers compared coding decisions. After comparing coding decisions, content analyses were performed. Thematic coding of data specific to the research objectives was analyzed from the interview notes, observations, and documents for pertinent data.

With Phase III, the national survey responses were analyzed using the statistical package SPSS Version 25 for Windows. Descriptive statistics included means, standard deviations, and frequencies of total responses. Reliability analysis consisted of item-total correlations and Cronbach's alphas. Inferential statistics used were chi-square test of independence, independent t-tests, and one-way ANOVAs. The $p < 0.05$ level of significance was used.

RESULTS

Phase 1: School Site Visit Interviews

A total of 23 semi-structured, individual interviews were conducted with SNP directors or administrators, chefs, and supervisory management staff. Specific position titles for each of the SNP leadership and SN staff subgroups varied from district to district. (See Table 1.) The interview questions were developed to obtain information about the roles and responsibilities of chefs working in SNPs. More specifically, participants were asked questions focused on the following constructs of interest: (a) job duties and responsibilities of SN chefs, (b) perceived impacts of chefs on SNP operations, (c) training required and/or provided to chefs, and (d) hiring practices of school food authorities in recruiting and hiring chefs.

Of the 23 interviewees, 30.4% were SN directors/administrators, 26.1% were SN chefs, and 43.5% were SN area supervisors/managers. Specific position titles for each of the SNP leadership and SN staff subgroups varied from district to district. (See Table 1.) Combined, the SN subgroups represent an average of 6.83 years of experience in their current role or position. The interviewees represented six (6) states and five (5) USDA, FNS regions. Those regions included the Northeast, Mid-Atlantic, Mountain Plains, Southwest, and Southeast regions.

Table 1

Summary of Participants by Job Title

| SNP Subgroups | Number of Participants | Percentage |
|--|---------------------------|-------------|
| SN Directors/ Administrators | 7 | 30.4 |
| Director | 3 | |
| Assistant director | 1 | |
| General manager | 1 | |
| Director of operations | 1 | |
| Assistant director of operations | 1 | |
| SN Chefs/Sous Chefs | 6 | 26.1 |
| Nutrition center supervisor | 1 | |
| Sous chef | 1 | |
| Executive chef | 1 | |
| Chef and nutrition coordinator | 1 | |
| District chef | 1 | |
| Culinary supervisor | 1 | |
| SN Area Supervisors/Managers/SN Staff | 10 | 43.5 |
| Manager supervisor/manager | 7 | |
| Kitchen training specialist | 1 | |
| Operations manager | 1 | |
| Head cook | 1 | |
| Total | 23 | |

The semi-structured interviews were designed to help identify the roles, job duties, and responsibilities of chefs working in SNPs, the benefits and challenges of hiring chefs, and the perceived impacts of chefs on SN operations. Each identified subgroup was asked similar questions related to the objectives of the research. The results provided are stratified into four major components: hiring practices, job duties and responsibilities, training, and perceptions of the impact of a chef in an SNP.

Hiring Practices

Both the SN directors/administrators and supervisory staff were asked about the process used by the SFA to garner staff and administrative buy-in as it related to bringing a chef onboard into the local SNP. The themes identified for hiring practices are presented in Table 2, and quotes illustrating the themes are found in Table 3.

The SN directors/administrators and SN supervisory staff expressed varying conceptualizations of the process used to acquire buy-in to hire a chef in an SNP. SN directors and administrators reported that the SN team either previously had experience with volunteer chefs in the school district or had no need to get any buy-in from staff to onboard a new chef position. Another common response from SN directors/administrators was that a vacant position existed during the time the chef position was considered, thus eliminating the need to convince school district administrators to provide additional funding. SN supervisory staff confirmed the primary theme identified by directors and administrators. Most SN supervisory staff shared that they were not involved in the hiring of the chef. It is important to note that some supervisory staff indicated that they were either not a part of the local SNP when a chef was initially hired or were not in a supervisory role during the chef's initial hiring.

The SN directors/administrators and SN chefs were asked about the recruitment processes used to attract chefs to the local SNP. The reported recruitment methods varied slightly among the two groups. While both the SN directors/administrators and the chefs indicated online methods were employed to recruit chefs, some SN directors noted that they connected with local culinary schools to recruit chefs. Conversely, none of the chefs interviewed indicated that they became aware of the SN chef position through the local culinary school. Many chef interviewees stated that they were recruited by the local school district and SNP or by local SNP staff. (See Table 2.)

The SN directors/administrators and SN supervisory staff were asked about the challenges experienced while hiring a chef on the SNP staff. Responses varied among the two groups. The majority of the SN directors and administrators indicated that the primary challenges of hiring a chef were: (a) difficulties finding qualified individuals who were willing to fill the role of chef in the SNP and/or (b) concerns of the qualified applicants regarding the impact of SNP rules and regulations on innovation and creativity in recipe development and meal preparation. In contrast, SN supervisory staff across case study sites expressed concern for the knowledge deficit of chefs related to SNP regulations and concern with the adaptability, of a chef, to the rigor of the SNP. (See Table 2.)

As the participants addressed the benefits of hiring a chef, SN directors, supervisory staff, and chefs agreed in a few areas and differed in others. All three subgroups agreed that the culinary knowledge and skills and recipe development expertise were significant benefits for hiring a chef. Both chefs and supervisory staff agreed that having a chef provide staff training and development is also beneficial. While SN directors/administrators agreed that chefs add credibility to the SNP, SN chefs reported that having a chef would increase student exposure to different foods and improve the SNP's financial outcomes. (See Table 2.)

Table 2

Data Matrix for Chef Hiring Practice Interview Questions

| Themes by Respondent Group | | | | |
|-----------------------------------|--|---|--|--|
| Respondent Group | Staff & Administrative Buy-In | Recruitment Process | Hiring Challenges | Benefits of Hiring |
| SN Directors and Administrators | <ol style="list-style-type: none"> 1. Existing position was vacant 2. None needed 3. Previous experiences with volunteer chef 4. Not involved in the process | <ol style="list-style-type: none"> 1. Local culinary school 2. Online (i.e., district website, SN websites) | <ol style="list-style-type: none"> 1. No challenges experience 2. Perceived impact on chef's innovation and creativity 3. Finding qualified staff | <ol style="list-style-type: none"> 1. Credibility to the SNP 2. Culinary knowledge and skills 3. Recipe development |
| SN Supervisory Staff | <ol style="list-style-type: none"> 1. Directly informed of hire 2. Not involved in the process | — | <ol style="list-style-type: none"> 1. Adapting to change 2. Knowledge deficit related to SNP | <ol style="list-style-type: none"> 1. Culinary knowledge and skills 2. SN staff training 3. Consistency in Recipes |
| SN Chefs | — | <ol style="list-style-type: none"> 1. Referral by current or former school or SN Staff 2. Online (i.e., advertisement sites) 3. Hired from within the SNP (working as a manager) | — | <ol style="list-style-type: none"> 1. Culinary knowledge and skills 2. SN Staff Training 3. Improve quality of meals 4. Student exposure to different foods 5. Cut food costs |

Note: A “—” indicated the question was not asked of the respondent group.

Table 3

Quotes Illustrating Themes for Hiring Practices

| Key Questions | Representative Quotes |
|---|--|
| District Administration and Staff Buy-In | |
| SN Directors and Administrators | <p>“...our method to gain buy-in from all of our employees was to conduct what we called culinary boot camps during the summer.”</p> <p>“By then my staff was okay with it [hiring a chef], each kitchen had had at least one guest chef event, so the way was paved”</p> |
| SN Supervisory Staff | <p>“I’ve seen three chefs here. I don’t believe the managers were in on the hiring process, or the chefs. I believe that was just central-office based.”</p> |
| Recruiting Chefs | |
| SN Directors and Administrators | <p>“...culinary school downtown, so we put it on their website”</p> <p>“I also had somebody in mind for the position originally...”</p> <p>“We used the regular channels, online, so our HR department does that.”</p> |
| SN Chefs | <p>“My neighbor was the school nurse at the time, and she told me she thought I would be a good fit for the job.”</p> <p>“And she was in touch with the office and knew what was going on hiring wise and she was like, ‘I have somebody who would be perfect for that job’. So, she told me about it.”</p> |
| Hiring Challenges | |
| SN Directors and Administrators | <p>“...one of the biggest barriers was feeling like we were disallowing the chefs to be creative...”</p> <p>“We didn’t get a lot of qualified applicants or a lot of applicants...”</p> <p>“Not really. We were very fortunate. We had a lot of applicants....”</p> <p>“Well, I didn’t have a challenge with getting them on board.”</p> |
| SN Supervisory Staff | <p>“The challenge I’ve seen is finding a chef who can adapt to our environment.”</p> <p>“They don’t use recipes.... That’s the biggest thing because we couldn’t mimic it.”</p> |

(Table 3 continues)

(Table 3 continued)

Quotes Illustrating Themes for Hiring Practices

| Key Questions | Representative Quotes |
|----------------------------------|---|
| Benefits of Hiring a Chef | |
| SN Directors and Administrators | <p>“When parents know there is a chef on staff and they see her influence, they’re more willing to let their kids eat school meals.”</p> <p>“... understood simplification for our buying processes...helping streamline our ordering and our inventory.”</p> <p>“... chef raises the bar on the menu and menu offerings”</p> |
| SN Supervisory Staff | <p>“...it’s amazing to always have somebody to turn to that knows things that we aren’t necessarily exposed to as maybe kitchen managers or just staff members.”</p> <p>“Consistency is a big thing now. You can go from A to B and they look the same”</p> <p>“...has really helped in teaching people techniques that are faster, that are more efficient, that are safer.”</p> |
| SN Chefs | <p>“...it benefits the students, in the regard that there is less reliance on heavily-processed food...”</p> <p>“But now we sauté’ our onions, we sauté’ our garlic, we bloom our cumin, we make sure our steps are there so the flavor comes out.”</p> <p>“we’re making the most out of a recipe without adding a dime to it.”</p> <p>“It’s teaching them how to cook and why we’re doing it the way we’re doing it”</p> |

Job Duties

The SN directors/administrators, SN supervisory staff, and SN chefs addressed the primary job duties and functions of chefs working in SNPs. All three subgroups expressed that staff training, leadership, and recipe development were primary job duties for a chef in an SNP. While similarities between groups were identified, only the SN directors/administrator and supervisory staff noted menu development as a job duty and responsibility. Both SN chefs and directors/administrators cited student engagement as a job responsibility of the chef. Chefs also reported additional job responsibilities beyond those shared in all three groups. Those were food quality, food safety, and procurement. (See Table 4.)

When SN directors/administrators and chefs were asked to sort the job duties into functional areas, similar themes arose in both subgroups. These themes included the development of recipes, staff training, marketing, and personnel management. The groups differed relating to safety and sanitation, which was a theme identified among SN directors/administrators. The groups also differed pertaining to quality control and procurement, both themes that emerged from the chefs’ group. Quotes illustrating the themes identified under job duties are found in Table 5.

Table 4

Data Matrix for Chef Job Duties Interview Questions

| Themes by Respondent Groups | | |
|------------------------------------|--|---|
| Respondent Group | Primary Responsibilities | Job Functional Areas |
| SN Directors and Administrators | <ol style="list-style-type: none"> 1. Staff Training 2. Menu and Recipe Development 3. Student Engagement 4. Leadership | <ol style="list-style-type: none"> 1. Menu and Recipe Development 2. Staff Training 3. Safety and Sanitation 4. Personnel Management 5. Marketing |
| SN Supervisory Staff | <ol style="list-style-type: none"> 1. Menu and Recipe Development 2. Staff Training 3. Leadership | — |
| SN Chefs | <ol style="list-style-type: none"> 1. Recipe Development 2. Staff Training 3. Food Quality and Safety 4. Procurement 5. Student Engagement 6. Leadership | <ol style="list-style-type: none"> 1. Research and Development 2. Staff Training 3. Personnel Management 4. Marketing 5. Quality Control 6. Procurement |

Note: A “—” indicated the question was not asked of the respondent group.

Table 5

Quotes Illustrating Themes for Job Duties

| Key Questions | Representative Quotes |
|---------------------------------|--|
| | Primary Job Duties |
| SN Directors and Administrators | <p>“...in charge of testing and scaling all of our recipes.”</p> <p>“Whether it be focus groups or product testing or testing recipes ...has been really great at that.”</p> <p>“...being the face of the program...”</p> |
| SN Supervisory Staff | <p>“...comes up with new recipes for us to try.”</p> <p>“Technique...chopping correctly, using your knife skills safely and correctly.”</p> |
| SN Chef | <p>“I work a lot in the test kitchen...I come up with a recipe in my head and I’ll work it through in my head in the kitchen...”</p> <p>“I schedule what I call ‘walk about(s)’ or visits...support people through email, texts or phone...”</p> |

Training

Participants were asked to provide feedback regarding the type of SNP-related training chefs received pre- and post-hiring. The themes and quotes identified under training are provided in Table 6 and Table 7. Chefs only were asked to describe the level of training received related to SNPs prior to becoming an SN chef. The majority of the respondents indicated that they had not received any training on SNPs. A few respondents noted that they worked in the SNP before being hired as the SN chef and received SNP management training. (See Table 6.)

When participants were asked about the training provided to chefs upon hiring, most of the respondents noted that chefs had received on-the-job training after being hired at an SNP. Chefs and SN directors/administrators stated that they received training on SNP regulations and guidelines and training on how to work efficiently in an SNP. The SN supervisors added that chefs received training in proper communication with staff after being hired. (See Table 6.)

In response to the question about key knowledge and skills needed to ensure a chef could be successful in an SNP, the themes identified were:

1. Chefs need knowledge and skills in SNP regulations and guidelines;
2. Chefs need knowledge and skills in recipe development based on SNP guidelines; and
3. Chefs need people skills.

Additionally, some patterns arose between groups and within groups interviewed. Respondents within both the chefs' and the supervisors' groups noted that chefs need time management skills. Similarly, respondents within all three groups (chefs, supervisors, and directors) mention communications as a critical knowledge or skill required for chef success. However, communication skills and time management skills did not emerge as a key theme in either group. (See Table 6.)

Table 6

Data Matrix for Training Interview Questions

| Themes by Respondent Group | | | |
|-----------------------------------|--|---|---|
| Respondent Group | Training on SNP Prior to Hiring | Training Provided at SNP | Knowledge and Skills Needed for Success in SNP |
| SN Directors and Administrators | — | 1. SNP regulations and guidelines | 1. SNP guidelines and regulations 2. Recipe development based on SNP guidelines 3. Adult education skills 4. Competent culinary skills 5. People skills |
| SN Supervisory Staff | — | 1. Efficiencies in SNP operations 2. Communication with staff 3. No training provided | 1. SNP guidelines and regulations 2. Recipe Development based on SNP guidelines 3. People skills |
| SN Chefs | 1. No training 2. Manager training | 1. SNP guidelines and regulations 2. Efficiencies in SNP operations | 1. SNP guidelines and regulations 2. Recipe development based on SNP guidelines |

Note: A “—” indicated the question was not asked of the respondent group.

Table 7

Quotes Illustrating Themes for Trainings

| Key Questions | Representative Quotes |
|--|---|
| Training on SNP Prior to Hiring | |
| SN Chefs | <p>“Prior to being hired, I did not really have any school-nutrition specific training.”</p> <p>“Zero. Nothing.”</p> <p>“I was a manager. I had a lot of job training...”</p> |
| Training Provided at SNP | |
| SN Directors and Administrators | <p>“Very involved in the menu planning”</p> <p>“...share that knowledge of regulations and guidelines we have to meet...”</p> <p>“Most chefs aren’t familiar with the school regulations. So, it did take quite a bit of work on that end”</p> |
| SN Supervisory Staff | <p>“We did do quite a bit of, ‘This is how you need to address kitchen managers.”</p> <p>“Definitely communication. How to create recipes that are readable...”</p> <p>“I had to teach them to measure, that you have to measure, to make it consistent.”</p> <p>“One of the biggest things I had to help her with was I had to get her moving a little faster...”</p> |
| SN Chef | <p>“Pretty much everything SN specific was on the job.”</p> <p>“I had leadership training, time management, all that stuff.”</p> <p>“...shadowed managers to see what they did.”</p> <p>Knowledge and Skills Needed for Success in SNP</p> |
| SN Directors and Administrators | <p>“...came from hotels and restaurants so she was familiar with foodservice but it is a little bit different when you are dealing with school foodservice...”</p> <p>“He belittled my staff constantly...felt as if they knew very little about food and cooking”</p> <p>“...understand adult education skills.</p> <p>“People skills. You can teach anybody core concepts. It’s hard to teach people skills.”</p> |

(Table 7 continues)

(Table 7 continued)

Quotes Illustrating Themes for Trainings

| Key Questions | Representative Quotes |
|---------------------------------|--|
| Training Provided at SNP | |
| SN Supervisory Staff | <p>“They need to know all the guidelines we need to follow.”</p> <p>“People Skills... because we are a community. You are working with the public, you are working with someone’s children, it’s huge.”</p> |
| SN Chef | <p>“Oftentimes I will make something for the menu, we’ll develop the recipe, taste it, and say ‘It needs more salt, but I can’t put any more in.’”</p> <p>“I think the regulations are the biggest part.</p> |

Impact on School Nutrition Programs and Operations

Participants were asked to share the perceived impacts the SN chef has on various aspects of SNP operations, including operations, food consumption, student satisfaction, student engagement, and SNP finances. (See Table 8.) Generally, SN supervisors and SN directors/administrators found it impossible to attribute any impact to the SN chef in two areas – food consumption and finances. This was due, in part, to the fact that the effects of chefs on these two areas have not been measured systematically.

As participants were asked to address different SNP operations areas, the initial question was about overall SNP operations. The nature of the impact of a chef on overall SNP operations appeared to be driven by three themes: (a) recipe development, (b) menu planning, and (c) chef creativity.

The themes that emerged for the chef’s perceived impact on food consumption varied among groups. Chef-inspired meals and food preparation and presentation were what SN directors attributed to a positive impact on student consumption. SN supervisors identified the chef’s use of innovative foods and ability to menu kid-approved items as themes associated with a chef’s impact on food consumption.

As for the perceived impact of chefs on student satisfaction, both SN directors and SN supervisors agreed that chefs offering the opportunity for product tasting to the student population improved satisfaction. School nutrition directors added that the chef’s ability to improve food quality and taste, as well as the chef’s ability to increase menu variety, had an impact on student satisfaction. School nutrition supervisors agreed that new recipes and food ideas and chefs directly engaging students were what improved student satisfaction.

When asked about the chef's impact on student engagement, all groups responded in the affirmative. Collectively, the three subgroups reported taste testing opportunities, chefs working in the classroom, and chefs participating in culinary competitions and cooking clubs as key methods of student engagement. Two of the three groups agreed that the chef's use of social media and the chef's provision of opportunities for the students to provide feedback through student surveys significantly impacted student engagement.

As stated earlier, there were many responders from both SN directors and SN supervisors indicating that chefs had no perceived or measured impact on SNP finances. Beyond that, recipe development by SN chef and culinary skills of an SN chef emerged as themes for SN directors. School nutrition supervisors noted that chefs had an impact on finances by increasing student participation, decreasing food costs, and increasing sales of specific food items.

Table 8

Data Matrix for Specific Impacts of Chef on SN Programs and Operations Interview Questions

| Themes by Respondent Groups | | | | | | |
|------------------------------------|--|---|--|---|---|--|
| Respondent Group | Impact on Overall Operations | Impact on Food Consumption | Impact on Student Satisfaction | Impact on Student Engagement | Impact on SNP Finances | |
| SN Directors and Administrators | <ol style="list-style-type: none"> 1. New recipe development 2. Training 3. Menu planning 4. Creativity and Innovation | <ol style="list-style-type: none"> 1. Chef-inspired meals 2. Food preparation and presentation | <ol style="list-style-type: none"> 1. Improving food quality and taste 2. Increased menu variety 3. Taste-testing opportunities and surveys | <ol style="list-style-type: none"> 1. Taste-testing opportunities 2. Chefs in the classroom 3. Social media 4. Culinary competitions and clubs | <ol style="list-style-type: none"> 1. No impact/can't attribute to chef 2. Recipe development 3. Culinary skills and techniques | |
| SN Supervisory Staff | <ol style="list-style-type: none"> 1. Organizing recipes 2. Introducing new food items 3. Creativity and Innovation | <ol style="list-style-type: none"> 1. Innovative use of foods 2. Menuing kid-approved items 3. No impact | <ol style="list-style-type: none"> 1. New recipes and food ideas 2. Taste-testing opportunities 3. Engaging students directly | <ol style="list-style-type: none"> 1. Chefs in the classroom 2. Culinary competitions and cooking clubs 3. Taste-testing opportunities 4. Student Surveys | <ol style="list-style-type: none"> 1. No Impact/can't attribute to chef 2. Increased participation rates 3. Decreased food cost 4. Increase sales of specific items | |
| SN Chefs | <ol style="list-style-type: none"> 1. Recipe Development 2. Research and Development 3. Developing and Improving flavor profiles 4. Improving food quality | _____ | _____ | <ol style="list-style-type: none"> 1. Social media 2. Culinary competitions and cooking clubs 3. Taste testing opportunities 4. Chefs in the classroom 5. Student surveys themed meals | _____ | |

Note: A “—” indicated the question was not asked of the respondent group.

Phase II

Expert Panel

Sixteen SN professionals served as expert panel members for the development of a national survey for chefs working in SNPs. These expert panel members were invited to participate in several rounds of discussion to assist in developing the final draft national survey for chefs working in schools. Sixteen panel members participated in the expert panel meeting (first round of discussions) and 12 (75%) expert panel members responded to the guided review of the draft national survey (second round of discussions).

Expert Panel Focus Group. The expert participants were asked a series of 17 questions to explore the roles and responsibilities of a school chef, the hiring and training practice to onboard a chef to an SNP, and chefs' impact on SNPs. Overall, the findings in this expert panel reflected the results identified in Phase I interviews.

The initial discussion topic for the expert panel was on hiring a chef in an SNP. Participants were asked about the driving forces that lead to hiring a chef for the SNP. The themes identified in this discussion were improving SNP credibility, elevating flavor profiles, SN staff training, and improving food quality. Also, participants were also asked to share their perceived benefits of hiring a chef in an SNP. The themes from that discussion were food quality, training and skill development for SN staff, cost savings and budget management, menu planning, and recipe development.

Under the topic of hiring a chef in an SNP, the group discussed methods to attract chefs to the SNP and how SFAs garner support and buy-in from administrators and staff. As for marketing strategies to attract chefs, participants noted several vital methods to attract chefs to the SNP: (a) sharing the positive work-life balance afforded to individuals working with an SNP, (b) explaining the benefits (including salary and fringe) of working with an SNP, (c) noting the opportunity to impact lives in the community as a result of working with an SNP, and (d) highlighting the idea that working with an SNP can help change the perception of SNP. The themes identified for garnering buy-in from the school administration were centered around the budget and program operations. The primary themes for administration buy-in were cost comparison and cost analysis. Some secondary themes for administration buy-in were developing and maintaining a relationship with the school administration. The themes identified for getting buy-in from SN staff were establishing a positive relationship with the SN staff and utilizing a tiered approach to introducing the chef (introduce to managers first, then to other SNP staff).

Another area under the topic of hiring a chef was the required and preferred qualifications. The commonly listed required qualifications were a degree with experience (either bachelor's degree or associate's degree), ServSafe certification (or ability to obtain one in a set period of time), culinary degree, and experience working in the culinary industry. The preferred qualifications varied between the groups. Three qualifications were listed in both groups: experience with volume cooking (institutional cooking), SN experience, and experience in training adults. Some of the preferred qualifications for school chefs being

bilingual/multilingual, having management experience, and being American Culinary Federation certified.

The second discussion topic for the expert panel work group was the job duties and responsibilities of chefs working in an SNP. The first question under this topic was related to the different positions a chef can have in an SNP. The expert panel participants noted that chefs could be hired as (a) culinary supervisor, (b) manager of culinary operations, (c) culinary specialist, (d) nutrition center supervisor, (e) production supervisor, (f) director, (g) executive chef, (h) consultant chef, (i) manager supervisor, (j) catering supervisor, (k) chef manager, (l) assistant director, (m) area manager, or (n) district culinary trainer.

The expert panel work group discussed the specific job duties and responsibilities typically given to a chef working in SNPs. Some of the commonly listed tasks and responsibilities included (a) training, (b) recipe development, (c) menu planning, (d) taste testing, (e) student engagement through surveys and focus groups, (f) quality control, (g) inventory management, (h) purchasing and ordering food, (i) nutrition analysis, and (j) food safety. The participants were subsequently asked to create functional areas or broad grouping titles for the job duties and responsibilities they described for chefs. The commonly listed functional areas were staff development, culinary, marketing, and program operations and administration.

Participants were asked to share the knowledge and skills essential for a chef to succeed in an SNP. The responses included (a) culinary skills (such as knife skills, understanding weights and measures, and flow of operations); (b) soft skills (such as managing and relating to people and the ability to be respectful); (c) coaching and mentoring skills; (d) patience, (e) flexibility, (f) know how to cost out food, (g) understand food safety, (h) understand forecasting, (i) understand ordering, (j) receiving and inventory management, and (k) time management.

The third discussion topic for the expert panel work group was training. The group was asked about the role the chef has in training SN staff. The responses included (a) culinary skills training, (b) customer service, (c) safety and sanitation, (d) workflow efficiencies, (e) reading and executing recipes, (f) production record training, and (g) smarter lunchroom techniques.

The final discussion topic for the expert panel members was related to the impact chefs have on SNPs. More specifically, the questions asked addressed SN operations and student satisfaction. When asked about the impact chefs had on SN operations, the themes that emerged were (a) changes in perceptions of the SNP, (b) improved staff morale, (c) increased student participation over time, (d) enhanced meal quality, and (e) customer service advancements. One theme emerged from discussing the chef's impact on student satisfaction shared between both groups: increased student participation. The groups also noted that chefs in SNPs support increased awareness of the SNP, exposed students to different foods, and encouraged students to try new and different foods.

Expert Panel Survey Development. The expert panel work group was utilized to help evaluate a survey instrument developed based on literature review, previous survey instrument design, and data collected from the case study site visits in Phase I. Expert panel members were asked to review and react to the survey instrument through the process of personal reflection,

group discussion, and retrospective verbal probing. The evaluation process included modifying current questions, deleting questions, or developing new questions. The initial survey the expert panel reacted to contained 6 sections (hiring, job duties and responsibilities, training, chef success, impact, and personal and program characteristics) and a total of 208 questions (multiple choice and Likert-type scale questions).

As a part of the survey development, the entire group of experts worked to modify, delete, or develop new questions. The expert panel work group reviewed each section of the survey instrument. The researcher led the group through a series of questions for each section. These questions were:

- 1) Were the instructions clear?
- 2) Which questions are unclear or hard to understand?
- 3) Which questions are clear and concise?
- 4) Are there any problems in understanding how to answer the questions?
 - a. Are the responses in the correct order?
- 5) Which questions should be removed?
- 6) Where are the gaps? What needs to be asked that hasn't been asked?

Participants were encouraged to respond openly and honestly about the questions within each of the section headers. After the open discussion with the expert panel work group, suggestions were documented. At the end of the first day, the researcher implemented all the panel of experts' recommendations.

The updated copy of the draft national survey was presented to the expert panel work group for final review. The updated version of the survey included the same number of sections, however one section heading name was modified. The hiring section was changed to recruiting and hiring. Additionally, the updated draft national survey contained 165 questions. Upon review of the updated draft of the national survey, the expert panel work group repeated the review process reported previously. Each section of the survey was reviewed for clarity, accuracy, and gaps. As a result of the final round of modifications to the draft national survey, the document contained 6 sections and 154 multiple choice and Likert-type scale questions.

The next step in this process was to have the expert panel work group members review the survey's latest draft copy. This was essentially the second round of communications with the group. This round was conducted after the panel meeting ended. The expert panel members were tasked with evaluating the draft survey developed in round one (the expert panel meeting). The expert panel members were provided with a review form to assist in the evaluation of the draft national survey. Panel member were asked to assess each section of the draft survey using similar parameters as used in the expert panel meeting, including clarity, readability, appropriateness of terminology, and accuracy. Panel members were also given the opportunity to provide revision suggestions and additions, as deemed necessary. A 70% agreement was required to make changes to the draft survey, based on participant comments. Overall, greater than 70% agreement was found on the parameters assessed by the guided review form. Panel members did make suggestions for wording, clarity, and question additions. The researcher reviewed these

recommendations and included them if they were found to be supported by the current research and literature.

National Survey: Pilot Study

Distribution of Surveys. The ICN, ARD distributed 30 surveys to a pilot study sample of professionals and chefs working in SNPs. Fourteen (47%) of the surveys were returned in the time period. The demographic description of the sample is presented in Table 9. The sample consisted of 9 SNP personnel and 5 SNP chefs. The majority of the respondents (57%) had 15 or fewer years of experience, while 79% of the respondents worked in school districts with less than 10,000 students. At least one respondent from each USDA region returned the survey. All respondents worked in an SNP that was self-operated.

Survey Evaluation. In addition to completing the survey, pilot study respondents were asked to complete a survey evaluation form to assess the completeness and readability of the survey. The complete results of this evaluation are given in Table 10. All items were rated as acceptably written or higher and were deemed appropriate and easy to read. Some minor suggestions were made relative to topics omitted and/or redundancies. The time required to complete the survey averaged from 20-30 minutes, with a few respondents reporting more time than that due to interruptions.

Actual Survey Results. The completed surveys were examined for completeness and logic. Virtually no blanks were noted in the returned surveys. The logic required in some questions (for example, Part II: Strategies and Part IV: Training) presented no problems for the respondents and appeared to be answered appropriately. No write-in responses were noted in the questions where “other” categories were given.

Several parts of the survey were analyzed for item-total correlations and reliabilities to examine the scales themselves. This procedure allows the researcher to ascertain the overall inclusion of items relative to the major topics. All item-total correlations in all scales were greater than .90. Part III: Job Duties and Responsibilities yielded a Cronbach’s alpha of .943. Part V: Chef Success in SNPs yielded a Cronbach’s alpha of .927. Part VI: Impact of Chefs Working in SNPs was divided into Meal Quality (Cronbach’s alpha of .932) and Program Operations and Activities (Cronbach’s alpha of .965). These high values and the high item-total correlations indicated that no items were deemed to be subject to elimination by any of the processes used to examine them. All items seem to be appropriate to the topics.

Table 9

Demographic Characteristics of Pilot Sample (n = 14)

| | Frequency | Percentage |
|--|-----------|------------|
| Job Title | | |
| SN director | 8 | 57.1 |
| SN supervisor | 1 | 7.1 |
| District level chef | 2 | 14.3 |
| Director chef | 3 | 21.4 |
| Years of SNP experience | | |
| 1-5 years | 3 | 21.4 |
| 6-10 years | 3 | 21.4 |
| 11-15 years | 2 | 14.3 |
| 16-20 years | 4 | 28.6 |
| more than 20 years | 2 | 14.3 |
| Total enrollment in school district | | |
| less than 2,799 | 7 | 50.0 |
| 2,800-9,999 | 4 | 28.6 |
| 10,000-29,000 | 1 | 7.1 |
| greater than 30,000 | 2 | 14.3 |
| USDA region | | |
| Western | 1 | 7.1 |
| Mountain plains | 1 | 7.1 |
| Southwest | 3 | 21.4 |
| Midwest | 1 | 7.1 |
| Southeast | 2 | 14.3 |
| Northeast | 1 | 7.1 |
| Mid-Atlantic | 5 | 35.7 |

Table 10

Frequencies on Chef Survey Evaluation Form (n = 14)

| Question | Frequency | Percentage |
|---|-----------|------------|
| 1. How well written are the instructions for completing the survey? | | |
| Acceptably Written | 4 | 28.6 |
| Well Written | 4 | 28.6 |
| Very Well Written | 6 | 42.9 |
| 2. To what extent are the questions in the survey appropriate for school nutrition (SN) directors, management staff, chefs, and State agency professionals? | | |
| Somewhat | 7 | 50.0 |
| A great extent | 7 | 50.0 |
| 3. To what extent are the questions easy to understand? | | |
| Somewhat | 4 | 28.6 |
| A great extent | 10 | 71.4 |
| 4. To what extent are the response options provided simple and easy to understand? | | |
| Somewhat | 4 | 28.6 |
| A great extent | 10 | 71.4 |
| 5. How likely are the questions to produce information pertaining to your experience with or as a chef in SN programs? | | |
| Somewhat likely | 6 | 42.9 |
| A great extent | 8 | 57.1 |
| 6. How many items are appropriate or redundant? | | |
| Hardly any | 6 | 42.9 |
| A few | 2 | 14.3 |
| Some | 6 | 42.9 |

Phase III

National Survey

Of the 510 surveys mailed out to SN professionals or individuals who have worked directly with SNPs, 188 surveys (36.9%) were completed and mailed back to the ICN, ARD. Frequencies and percentages of demographic variables are contained in Table 11. The data from the national survey was divided into two categories: SN management and chef. SN management respondents (n=116) represented SN management, including directors, assistant directors, supervisors, and managers. Chef respondents (n=72) included site-level chefs, district-level chefs, director chefs, or State agency professionals who were also chefs.

Part I: Personal Demographics, School Nutrition Program, and School Site Information

Demographics. Part I of the survey consisted of a very detailed collection of demographic data to get a comprehensive look at the respondents of the national survey. The majority of the 188 respondents were SN management (61.7%). Of the SN management-level personnel responding to this survey, 88.8% were SN directors/assistant directors with 16-20 years of experience in their current position (38.8%). Of the chef respondents, almost half (45.8%) were described as district-level chefs with 16-20 years of experience in their current position (58.3%). Approximately one-third of the SN management respondents (31.9%) indicated that they have more than 20 years' experience in SNPs, and more than one-third of the chef respondents (36.1%) noted that they have 16-20 years' experience in SNPs.

Participants were asked about their education level. One-third (33.3%) of the chefs reported having an associate's degree. Greater than one-third of both chef and SN management participants had a bachelor's degree (37% and 40.3%, respectively). Another one-third of the non-chef respondents (30.2%) reported having a master's degree.

Additional certifications and credentials were also reported by the respondents to this study. Although 41.7% of the chef respondents indicated that they did not have any formal certifications, one-third of the chef respondents (31.9%) had American Culinary Federation (ACF) certification. Additionally, 16.7% of the chef respondents reported being School Nutrition Association (SNA) certified, 12.5% were School Nutrition Specialist (SNS) credentialed, 5.6% were registered dietitians, and 4.2% were State Department certified. In contrast to the chef respondents, nearly one-third (32%) of the SN management respondents reported have no credentialing beyond a college degree. Nearly one-third of the SN management respondents (26.7%) had SNS credentialing, 19.8% of the SN management respondents were SNA certified, 18.1% were registered dietitians, 9.5% were licensed dietitians, and 9.5% were State Department certified. Around 10% of both the SN management and chef respondents (8.6% and 11.1%,

respectively) indicated that they had certifications that were not provided in the list of options. These additional certifications included Culinary Institute of American certification, culinary certification at the technical college level, and ServSafe certification.

As a part of the demographic questions, chef participants were asked to broadly describe their culinary career path. Greater than three-fourths (97.2%) indicated that their path to a culinary career was through culinary school, 90.3% was through workplace experience, 26.4% indicated the path was through a certificate program, 25% stated the route was through an apprenticeship, and 16.6% indicated the path to a culinary career was through other means. When given the opportunity to elaborate on those other means to a career in the culinary arts, respondents shared additional information related to certificate or degree programs.

School Nutrition Program and School Site Information. Participants were asked about the program demographics for the SNP in which they were affiliated, in terms of the number of students and the number of school sites served. About one-third of the SN management respondents (31%) worked in school districts with a total enrollment of greater than 30,000 students, 19.8% worked in school districts with 10,000 to 29,000 students, 1.7% worked in school districts with 2,800 to 9,999 students, and 20.7% worked in school districts with less than 2,799 students. Approximately 13.8% of chef respondents reportedly worked in school districts with greater than 30,000 students, nearly one-third of the chef respondents (27.8%) worked in school districts with a total enrollment of 10,000 to 29,000 students, 12.5% worked in school districts with 2,800 to 9,999 students, and 18% worked in school districts with less than 2,799 students. Conversely, nearly one-quarter of SN management (25.9%) and chef (25%) respondents were not directly affiliated with a specific school district.

As it relates to the number of sites in a local school district, findings indicated that sites served by both SN management and chef respondents were similarly distributed. About one-quarter of the SN management and chef respondents served five or fewer sites (26.7% and 22.2%, respectively). Furthermore, one-quarter of the SN management served in districts with 101 to 200 sites (21.6%), and about one-quarter of the chef respondents served in school districts with 300 to 400 sites (23.6%).

The participants were asked to provide information on the style of meal service provided to customers in the local SNP. Nearly all (96.6%) of the SN management respondents offered traditional cafeteria meal service using onsite full kitchens (92.1%) and greater than three-quarters of the chef respondents (88.9%) offered traditional cafeteria meal service utilizing onsite full kitchens (87.3%). Additionally, greater than three-fourths of SN management respondents offered grab-n-go meal options and food bars and salad bars (85.3% and 81.9%, respectively). Similarly, greater than three-fourths (81.9%) of the SNP where the chef respondents worked offered grab-n-go services and 67.2% for chefs worked in SNPs that offered food bars and salad bars. A little more than one-third of both the SN management (34.7%) and chef (32.8%) respondents offer pre-plated service in their school district, and one-quarter (25%) of all respondents offered a food court. More chef respondents (22.2%) than SN management respondents (11.2%) indicated there were other meal service offerings in the school districts they served. These services included family style, breakfast after the bell, build your own, breakfast in the class, and food truck.

The greatest number of participants, nearly half of the SN management respondents (47.4%) and 37.5% of the chef respondents, operated satellite kitchens. Twenty-one percent of chef respondents and 19.3% of SN management respondents were operating finishing kitchens, and 17.2% of SN management and 23.6% of chefs were operating central kitchens. A small percentage of respondents (2.6% of SN management and 9.7% of chef respondents) specified in comments that they offered additional services in their local SNP, including “half and half (onsite and finishing kitchens),” “outside vendor,” and “packaged meals.”

Participants were asked to share the kind of foodservice operations within their local districts. The majority of respondents reported that they were self-operated by district employees (85.3% SN management and 71.8% chefs). The second most common response was contract management through a Food Service Management Company (FSMC) (12.1% SN management and 15.5% chef respondents). A small number of respondents noted that they were managed by a combination of self-operated and FSMC (0.9% SN management and 8.5% chefs) and other means (1.7% SN management and 4.2% chefs).

The participants in this study have served in urban, suburban, and rural school districts. Approximately half of the participants, 43.1% SN management and 44.1% chefs, have served in urban school districts. Additionally, nearly or greater than one-half of the participants, 49.1% SN management and 54.2% chefs, have served in suburban school districts. Roughly one-third of all the participants have served in rural school districts, 30.2% SN management and 30.6% chefs.

All seven of the USDA, FNS regions were represented in this survey. Respondents were nearly evenly distributed among the three of the seven USDA, FNS regions represented in this study with 18.3% SN management and 23.6% chefs from both the Southwest; 19.8% SN management and 15.3% chefs from the Southeast; and 18.1% SN management and 13.9% chefs from the Northeast regions.

Table 11

Personal and Program Characteristics by Chef/SN Management

| Characteristic | SN Management (n = 116) | | Chef (n = 72) | |
|-----------------------------------|-------------------------|------------|---------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Job Title | | | | |
| SN Director/Asst Director | 103 | 88.8 | | |
| SN Supervisor/Manager | 13 | 11.2 | | |
| Management/ Staff | | | | |
| Supervisor Chef/Site-Level Chef | | | 8 | 11.1 |
| District Level Chef | | | 33 | 45.8 |
| State Agency Professional/Chef | | | 9 | 12.5 |
| Director Chef | | | 22 | 30.6 |
| Years of SNP Experience | | | | |
| Less than 1 year | 1 | 0.9 | 1 | 1.4 |
| 1-5 years | 14 | 12.1 | 11 | 15.3 |
| 6-10 year | 18 | 15.5 | 5 | 6.9 |
| 11-15 years | 30 | 25.9 | 22 | 30.6 |
| 16-20 years | 16 | 13.8 | 26 | 36.1 |
| More than 20 years | 37 | 31.9 | 7 | 9.7 |
| Years in Current Position | | | | |
| Less than 1 year | 4 | 3.5 | 4 | 5.6 |
| 1-5 years | 6 | 5.2 | 5 | 6.9 |
| 6-10 year | 11 | 9.6 | 4 | 5.6 |
| 11-15 years | 39 | 33.6 | 16 | 22.2 |
| 16-20 years | 45 | 38.8 | 42 | 58.3 |
| More than 20 years | 11 | 9.5 | 1 | 1.4 |
| Highest Level of Education | | | | |
| High School/GED | 7 | 6.0 | 2 | 2.8 |
| Associates Degree | 19 | 16.4 | 24 | 33.3 |
| Some College | 2 | 1.7 | 0 | 0 |
| Bachelor's Degree | 43 | 37.0 | 29 | 40.3 |
| Master's Degree | 35 | 30.2 | 11 | 15.3 |
| Doctoral Degree | 10 | 8.6 | 6 | 8.3 |

¹ Respondents could check multiple answers.

(Table 11 continues)

(Table 11 continued)

Personal and Program Characteristics by Chef/SN Management

| Characteristic | SN Management (n = 116) | | Chef (n = 72) | |
|---|-------------------------|------------|---------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Total Enrollment in School District | | | | |
| Less than 2,799 | 24 | 20.7 | 13 | 18.0 |
| 2,800 to 9,999 | 2 | 1.7 | 9 | 12.5 |
| 10,000 to 29,000 | 23 | 19.8 | 20 | 27.8 |
| Greater than 30,000 | 36 | 31.0 | 10 | 13.8 |
| Not applicable | 30 | 25.9 | 18 | 25.0 |
| Sites Served | | | | |
| 5 or fewer | 31 | 26.7 | 16 | 22.2 |
| 6 to 10 sites | 7 | 6.0 | 7 | 9.7 |
| 21 to 40 sites | 10 | 8.6 | 4 | 5.6 |
| 61 to 80 sites | 16 | 13.8 | 7 | 9.7 |
| 81 to 100 sites | 2 | 1.7 | 2 | 2.8 |
| 101 to 200 sites | 25 | 21.6 | 9 | 12.5 |
| 201 to 300 sites | 7 | 6.0 | 3 | 4.2 |
| 300 to 400 sites | 16 | 13.8 | 17 | 23.6 |
| 401 to 500 sites | 2 | 1.7 | 3 | 4.2 |
| Greater than 500 sites | 0 | 0.0 | 4 | 5.6 |
| Certification/Credential Status¹ | | | | |
| SNS credentialed | 31 | 26.7 | 9 | 12.5 |
| State Department certified | 11 | 9.5 | 3 | 4.2 |
| Registered Dietician/RDN/RD | 21 | 18.1 | 4 | 5.6 |
| Licensed Dietician | 11 | 9.5 | 0 | 0.0 |
| SNA Certified | 23 | 19.8 | 12 | 16.7 |
| American Culinary Federation (ACF) certification | 8 | 6.9 | 23 | 31.9 |
| Not certified | 32 | 27.6 | 30 | 41.7 |
| Other | 10 | 8.6 | 8 | 11.1 |
| Chef Career Development Pathway (Chefs only)¹ | | | | |
| Apprenticeship | | | 18 | 25.0 |
| Culinary school | | | 70 | 97.2 |
| Certificate program | | | 19 | 26.4 |
| Workplace experience | | | 65 | 90.3 |
| Other | | | 12 | 16.6 |

¹Respondents could check multiple answers. Percentages are reported of the total respondents in each of the two categories.

(Table 11 continues)

(Table 11 continued)

Personal and Program Characteristics by Chef/SN Management

| Characteristic | SN Management (n = 116) | | Chef (n = 72) | |
|--|-------------------------|------------|---------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Types of Meal Service¹ | | | | |
| Pre-plated service | 38 | 32.8 | 25 | 34.7 |
| Food bars/salad bars | 78 | 67.2 | 59 | 81.9 |
| Food court | 29 | 25.0 | 18 | 25.0 |
| Grab-n-go | 99 | 85.3 | 59 | 81.9 |
| Traditional cafeteria meal service | 112 | 96.6 | 64 | 88.9 |
| Other | 13 | 11.2 | 16 | 22.2 |
| Types of Foodservice Operations¹ | | | | |
| Onsite full kitchen | 105 | 90.5 | 62 | 86.1 |
| Satellite | 55 | 47.4 | 27 | 37.5 |
| Finishing kitchen | 22 | 19.0 | 15 | 20.8 |
| Central kitchen | 20 | 17.2 | 17 | 23.6 |
| Other | 3 | 2.6 | 7 | 9.7 |
| Types of School Districts¹ | | | | |
| Urban | 50 | 43.1 | 32 | 44.1 |
| Suburban | 57 | 49.1 | 39 | 54.2 |
| Rural | 35 | 30.2 | 22 | 30.6 |
| How SNP Uses OVS | | | | |
| Elementary and middle schools only | 2 | 1.7 | 4 | 5.6 |
| Middle and high schools only | 1 | 0.9 | 3 | 4.2 |
| High school only | 0 | 0.0 | 2 | 2.8 |
| All sites | 107 | 92.2 | 51 | 70.8 |
| Other | 4 | 3.5 | 9 | 12.5 |

¹Respondents could check multiple answers.

(Table 11 continues)

(Table 11 continued)

Personal and Program Characteristics by Chef/SN Management

| Characteristic | SN Management (n = 116) | | Chef (n = 72) | |
|--|-------------------------|------------|---------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| How SNP is Managed | | | | |
| Self-operated by district employees | 99 | 85.3 | 51 | 70.8 |
| Contracted by a Food Service Management Company (FSMC) | 14 | 12.1 | 11 | 15.3 |
| Combination of self-operated and FSMC | 1 | 0.9 | 6 | 8.3 |
| Other | 2 | 1.7 | 3 | 4.2 |
| USDA Region | | | | |
| Western (AK, CA, GU, HI, ID, NV, OR, WA) | 26 | 22.4 | 7 | 9.7 |
| Mountain Plains (CO, KS, MO, MT, ND, NE, SD, WY) | 7 | 6.0 | 7 | 9.7 |
| Southwest (AR, AZ, LA, NM, OK, TX, UT) | 21 | 18.3 | 17 | 23.6 |
| Midwest (IL, IA, IN, MI, MN, OH, WI) | 8 | 6.9 | 14 | 19.4 |
| Southeast (AL, FL, GA, KY, MS, NC, SC, TN) | 23 | 19.8 | 11 | 15.3 |
| Northeast (CT, MA, ME, NH, NY, RI, VI, VT) | 21 | 18.1 | 10 | 13.9 |
| Mid-Atlantic (DC, DE, MD, NJ, PA, PR, VA, WV) | 9 | 7.8 | 6 | 8.3 |

¹Respondents could check multiple answers.

Part II: Recruiting and Hiring Chefs

Part II of the survey addressed recruiting, hiring, and retaining chefs in SNPs. Both SN management and chef respondents were asked to provide insight into methods used to recruit chefs for SNP positions. While about half of the SN management (49.1%) and chef (45.8%) respondents indicated no active recruitment of chefs in school districts, one-third of the respondents indicated that the school district did actively recruit chefs. Methods used in recruiting chefs to the SNP included identifying chefs from within the school district (noted by 22.4% of SN management and 29.2% chef respondents) and identifying potential chef hires based on recommendations from outside organizations (9.5% SN management and 12.5% chefs). (See Table 12.)

Table 12

Recruiting and Hiring Chefs

| | SN Management (n = 116) | | Chef (n = 72) | |
|---|------------------------------------|-------------------|--------------------------|-------------------|
| | Frequency | Percentage | Frequency | Percentage |
| Methods Used to Recruit Chefs¹ | | | | |
| Chefs are not actively recruited | 57 | 49.1 | 33 | 45.8 |
| Chefs are recommended by outside organizations | 11 | 9.5 | 9 | 12.5 |
| Chefs are internally hired within the district | 26 | 22.4 | 21 | 29.2 |
| Chefs are recruited by the district | 38 | 32.8 | 24 | 33.3 |

¹Respondents could select more than one answer.

School nutrition directors were asked to provide insight into the strategies used to recruit chefs in SNPs. Only 95 directors responded to this question. (See Table 13.) The majority of the respondents used the following strategies: word of mouth (52.6%) and digital media such as website, Facebook, Twitter, and LinkedIn (36.8%). With regard to qualification (required, not required, and preferred) SN directors considered when recruiting and hiring chefs, the majority of SN directors required: a high school diploma or GED (89.4%), food safety certification (88.4%), experience in culinary arts (58.9%), computer skills (51.6%), and supervisory skills (50.5%). Additionally, a majority of the SN directors preferred experience in SNPs (60.7%), culinary degree (60%), and culinary certification (55.7%). Respondents were also encouraged to provide additionally required and preferred qualifications for hiring a chef beyond that which was provided on the survey. Some of the responses included effective communication skills, math skills, interpersonal skills (such as possessing the appropriate temperament and being motivated), training/teaching skills (including material development and demonstration skills), and experience with large volume cooking. (See Table 14.)

Table 13

Recruiting and Hiring Chefs (Directors Only n = 95)

| Strategies Used | Frequency | Percentage |
|--|------------------|-------------------|
| Digital Media (website, Facebook, Twitter, LinkedIn, etc.) | 35 | 36.8 |
| Job Fair | 12 | 12.6 |
| College Internship at the SNP | 8 | 8.4 |
| Culinary Arts Program (at a college or university) | 21 | 22.1 |
| Advertisement (print media, newspaper) | 29 | 30.5 |
| Word of Mouth | 50 | 52.6 |
| Trade shows | 7 | 7.4 |
| Professional associations | 19 | 20.0 |
| Other | 8 | 8.4 |

Note: Frequencies represent the number of directors who checked “yes.” Respondents could check multiple answers.

Table 14

Chef Qualifications (Directors Only n=95)

| Qualification | Frequency | Percentage |
|---------------------------------|-----------|------------|
| High School diploma or GED | | |
| Required | 84 | 88.4 |
| Preferred | 10 | 10.5 |
| Not Applicable | 0 | 0.0 |
| Associates Degree | | |
| Required | 27 | 28.4 |
| Preferred | 33 | 34.7 |
| Not Applicable | 28 | 29.5 |
| Bachelor's Degree | | |
| Required | 8 | 8.4 |
| Preferred | 42 | 44.2 |
| Not Applicable | 40 | 42.1 |
| Experience in SNPs | | |
| Required | 8 | 8.4 |
| Preferred | 54 | 44.2 |
| Not Applicable | 27 | 42.1 |
| Experience in the Culinary Arts | | |
| Required | 56 | 58.9 |
| Preferred | 35 | 36.8 |
| Not Applicable | 5 | 5.3 |
| State-Specific Certifications | | |
| Required | 10 | 10.5 |
| Preferred | 26 | 27.4 |
| Not Applicable | 50 | 52.6 |
| Food Safety Certification | | |
| Required | 73 | 76.8 |
| Preferred | 19 | 20.0 |
| Not Applicable | 3 | 3.2 |

(Table 14 continues)

(Table 14 continued)

Chef Qualifications (Directors Only n=95)

| Qualification | Frequency | Percentage |
|----------------------|------------------|-------------------|
| <hr/> | | |
| Culinary Certificate | | |
| Required | 24 | 25.2 |
| Preferred | 53 | 55.7 |
| Not Applicable | 14 | 14.7 |
| Culinary Degree | | |
| Required | 23 | 24.2 |
| Preferred | 57 | 60.0 |
| Not Applicable | 15 | 15.8 |
| Computer Skills | | |
| Required | 49 | 51.6 |
| Preferred | 39 | 41.1 |
| Not Applicable | 5 | 5.2 |
| Supervisory Skills | | |
| Required | 48 | 50.5 |
| Preferred | 35 | 36.8 |
| Not Applicable | 10 | 10.5 |
| Multilingual | | |
| Required | 2 | 2.1 |
| Preferred | 40 | 42.1 |
| Not Applicable | 46 | 48.4 |

Both SN management and chef respondents were asked to share the benefits and challenges of hiring a chef in the SNP. Respondents were asked to rate their level of agreement with statements related to the possible reasons for hiring a chef in an SNP. The agreement questions were rated on a scale of 1 (strongly disagree) to 5 (strongly agree). The results are given in Table 15. The highest-rated reasons for hiring a chef by SN management included “Chefs enhance the reputation and public perception of SNPs” (4.34), “Chefs enhance the food quality of school meals” (4.25), and “Chefs develop creative and innovative school menus and recipes” (4.22). The lowest-rated reason for hiring a chef by SN management was “Chefs improve the workplace safety for SNP employees” (3.59) and “Chefs improve the cost efficiency of procurement and food production processes in SNPs” (3.44). (See Table 15.)

Table 15

Reasons for Hiring Chefs

| Statement | SN Management (n = 116) | | Chef (n = 72) | |
|--|----------------------------|------|------------------|------|
| | Mean | SD | Mean | SD |
| Chefs evaluate the flavor profiles of school meal recipes and menus | 4.15 | 1.03 | 4.34 | 0.93 |
| Chefs develop creative and innovative school menus and recipes | 4.22 | 0.93 | 4.46 | 0.90 |
| Chefs integrate different styles of cooking to enhance school menus and recipes | 4.19 | 0.93 | 4.37 | 0.89 |
| Chefs increase the efficiency of food production in school kitchens | 4.07 | 0.98 | 4.50 | 0.90 |
| Chefs enhance the reputation and public perception of SNP | 4.34 | 0.95 | 4.31 | 1.04 |
| Chefs streamline district ordering and inventory management processes | 3.44 | 1.11 | 3.63 | 1.04 |
| Chefs develop standardized recipes for the district | 3.79 | 1.05 | 4.13 | 1.03 |
| Chefs enhance the food quality of school meals | 4.25 | 0.90 | 4.38 | 0.89 |
| Chefs improve the cost efficiency of procurement and food production processes in SNPs | 3.44 | 1.16 | 3.74 | 1.02 |
| Chefs improve workplace safety for SNP employees | 3.59 | 1.12 | 3.87 | 1.05 |
| Chefs improve menu planning and food production processes to minimize food waste and increase sustainability | 3.90 | 1.07 | 4.17 | 1.02 |

Note: Scale 1 = “Strongly Disagree” to 5 “Strongly agree”

With regard to the challenges of hiring chefs in an SNP, the survey examined both chef and SN management perspectives. As exhibited in Table 16, the most frequently cited concern for both SN management and chefs was, “Lack of knowledge related to USDA meal planning requirements for SNPs” (66.3% and 61.1%, respectively), “Lack of funds to support a chef position” (59.5% and 59.7%, respectively), and “Lack of awareness of SNP career opportunities” (47.4% and 61.1%, respectively). A small percentage of both SN management and chef respondents selected other reasons as the challenge for hiring chefs (10.3% and 15.3%, respectively). Respondents also provided insight into what those challenges were at the local level through open response opportunities. The reported additional challenges included: “Don’t know where or how to start,” “Locating sources to find chefs looking for jobs,” “A chef’s ego,” “Chef inability to abide by SN rules and regulations,” “Labor Unions,” “Overly complicated processes,” and “Director’s view of chef’s abilities.”

Chef respondents were exclusively asked to indicate the reasons why a chef would be interested in working in an SNP. Respondents were allowed to check all responses that applied. The majority of the respondents noted the following reasons for being attracted to working in SNPs: “Work/life balance” (81.9%), “Working with kids” (65.3%), “Opportunities to educate others” (45.8%), and “Cooking with a purpose” (62.5%). The chef respondents were also allowed an opportunity to elaborate on what attracted them to the SNP. Many of the responses were related to work/life balance, not working on weekends or holidays, opportunities to spend more time with family, and teaching and feeding the next generation. Some of the direct quotes from the open-ended question included:

1. “I truly feel like I am making a significant impact on students and society as a whole and the schedule is amazing for a family.”
2. “I was attracted to my first SNP when the opportunity opened in the school district that I attended when I was a child. It was something that I just couldn’t pass up being able to go full circle and come back to provide nutrition and education to the students from my hometown. The story was even featured in the local newspaper.”
3. “Aged out of hectic restaurant life...”
4. “‘Chefs Move to School’ by Michelle Obama – Passion for cooking and teaching”
5. “Necessity – A great job for someone with my skillset in an area with few opportunities for executive chefs.”
6. “Compared to work in restaurants, school nutrition is gratifying in that we are serving a greater purpose. In general, the team of school nutrition professionals is stellar, and it is a great working environment – Low on egos and no harassment.” (See Table 17.)

Turnover Rates and Factors. As a part of assessing recruiting and hiring chefs in SNPs, the survey also addressed turnover among chefs in SNPs. More specifically, the frequency of turnover in SN chefs over the last five years was evaluated. Both SN management (21.6%) and chef (33.3%) respondents indicated there had been no turnover in the chef position in the last five years. (See Table 18.) Both chef and SN management respondents were asked to identify factors that influence chef turnover in the local SNP. (See Table 19.) Only respondents who indicated some turnover in table 18 responded to this question (n=65). The three top-rated factors influencing chef turnover rates according to SN management were, “Chefs desired a higher salary” (21.5%), “Chef did not adapt to the SNP culture” (18.9%), and “Lack of freedom in meal

planning” (12.9%). The three top-rated factors influencing chef turnover rates according to chefs were “Chef did not adapt to the SNP culture” (18.1%), “Opportunities for career advancement” (15.3%), and “Other” (15.3%).

Table 16

Challenges of Hiring Chefs

| Statement | SN Management (n = 116) | | Chef (n = 72) | |
|--|----------------------------|------------|------------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Lack of knowledge related to USDA meal planning requirements for SNPs | 77 | 66.3 | 44 | 61.1 |
| Lack of support from school administrators to recruit and hire a chef | 28 | 24.1 | 25 | 34.7 |
| Lack of funds to support a chef position | 69 | 59.5 | 43 | 59.7 |
| Lack of awareness of SNP career opportunities | 55 | 47.4 | 44 | 61.1 |
| Lack of career advancement in SNPs | 31 | 26.7 | 25 | 34.7 |
| Inability to identify a pool of qualified chef candidates to interview and/or hire | 27 | 23.3 | 24 | 33.3 |
| Lack of adequate review of work history and qualifications during the interview process to ensure a match between SNP and chef | 12 | 10.3 | 8 | 11.1 |
| Other | 12 | 10.3 | 11 | 15.3 |

¹Respondents could select more than one answer.

Table 17

What Attracted You, As a Chef, to the SNP?¹

| Statement | Chef (n = 72) | |
|---------------------------------|---------------|------------|
| | Frequency | Percentage |
| Working with kids | 47 | 65.3 |
| Work/life balance | 59 | 81.9 |
| Cooking with a purpose | 45 | 62.5 |
| Salary | 25 | 34.7 |
| Benefits package | 33 | 45.8 |
| Opportunities to educate others | 46 | 63.9 |
| Deeper community connections | 28 | 38.9 |
| Other | 8 | 11.1 |

¹Respondents could select more than one answer.

Table 18

Frequency of Turnover¹

| Statement | SN Management (n = 116) | | Chef (n = 72) | |
|----------------------------|-------------------------|------------|---------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Once | 14 | 12.1 | 9 | 12.5 |
| Twice | 16 | 13.8 | 6 | 8.3 |
| Three or more | 11 | 9.5 | 9 | 12.5 |
| Unknown | 21 | 18.1 | 8 | 11.1 |
| This is a new position | 14 | 12.1 | 7 | 9.7 |
| There has been no turnover | 25 | 21.6 | 24 | 33.3 |

¹Respondents could select more than one answer.

Table 19

Factors that Influenced Chef Turnover Rate (n=65)^{1,2}

| Statement | SN Management (n = 41) | | Chef (n = 24) | |
|---|---------------------------|------------|------------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Chef desired a higher salary | 25 | 61.0 | 9 | 37.5 |
| Shortage of SN staffing | 7 | 17.0 | 7 | 29.2 |
| Lack of administrative support | 5 | 12.2 | 10 | 41.7 |
| Opportunities for career advancement | 14 | 34.1 | 11 | 45.8 |
| Lack of freedom in meal planning and preparation | 15 | 36.6 | 8 | 33.3 |
| Chef was unsatisfied with district's benefits package | 3 | 7.3 | 0 | 0.0 |
| Chef retired | 3 | 7.3 | 1 | 4.2 |
| The workload was too high. | 2 | 4.91 | 2 | 8.3 |
| Chef did not adapt to the SNP culture. | 22 | 53.7 | 13 | 54.2 |
| Misinterpretation of job expectations | 7 | 17.0 | 9 | 37.5 |
| Leaving for non-school career opportunities | 14 | 34.1 | 8 | 33.3 |
| Other | 12 | 29.3 | 11 | 45.8 |

¹Respondents could select more than one answer.

²Only respondents indicating some chef turnover in Table 18 responded to this question.

Part III: Job Duties and Responsibilities

Part III of the questionnaire involved questions related to the job duties and responsibilities of chefs in the SNP. The first section asked respondents to rate the importance of 30 job duties and responsibilities of a chef. The second part asked if the chef performed these duties. The questions were rated on a scale of 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The results are given in Table 20. Eleven SN Management and three chefs omitted responses for this section. The areas rated as lowest in importance for SN management were, “Procuring equipment, basic equipment and preparation, and general maintenance” (3.45) and “Coordinating garden to cafeteria programs” (3.48). The ones rated highest for SN management were, “Improving food quality” (4.63) and “Utilizing USDA foods” (4.56). The lowest for chefs were, “Production records training” (3.49) and “Coordinating garden to cafeteria programs” (3.62). The highest ratings for chefs were, “Improving food quality” (4.67) and “Culinary training for SNP staff” (4.53). The two groups of respondents significantly differed on “Production records training,” $t(172) = 2.08, p < 0.05$ and “Supervising line/tray presentations,” $t(172)=2.08, p < 0.05$. In both cases, the responses were rated higher by SN management than by chefs.

Table 20

Job Duties and Responsibilities

| Attribute | SN Management (n = 105) | | Chef (n = 69) | |
|--|----------------------------|------|------------------|------|
| | Mean | SD | Mean | SD |
| Engaging student customers to identify customer preferences and expectations for the SNP, and to improve customer satisfaction | 4.46 | 0.83 | 4.34 | 0.88 |
| Menu planning | 4.27 | 0.99 | 4.43 | 0.91 |
| Improving food quality | 4.63 | 0.84 | 4.67 | 0.79 |
| Managing food cost | 4.21 | 0.96 | 4.16 | 0.99 |
| Developing standardized recipes | 4.32 | 1.00 | 4.49 | 0.89 |
| Production records training ¹ | 3.87 | 1.13 | 3.49 | 1.19 |
| Sourcing ingredients | 3.93 | 1.04 | 3.86 | 1.18 |
| Food production scheduling | 3.97 | 1.10 | 3.89 | 1.16 |

Note: Scale 1 (*Strongly Disagree*) to 5 (*Strongly Agree*)

¹Difference statistically significant at $p < 0.05$

(Table 20 continues)

(Table 20 continued)

Job Duties and Responsibilities

| Attribute | SN Management (n = 105) | | Chef (n = 69) | |
|--|----------------------------|-------|------------------|------|
| | Mean | SD | Mean | SD |
| Culinary training for SNP staff | 4.54 | 0.82 | 4.53 | 0.81 |
| Batch cooking | 4.43 | 0.94 | 4.33 | 0.91 |
| Speed scratch/scratch cooking | 4.42 | 0.934 | 4.51 | 0.84 |
| Using and training on the operation of commercial kitchen equipment | 4.37 | 0.96 | 4.37 | 0.87 |
| Participating in local school wellness policy Initiatives | 3.62 | 1.02 | 3.75 | 1.10 |
| Utilizing food buying guide | 3.83 | 1.10 | 3.86 | 1.14 |
| Managing volume production | 4.30 | 0.92 | 4.20 | 0.96 |
| Incorporating current trends | 4.37 | 0.94 | 4.41 | 0.89 |
| Involvement in food procurement process | 3.83 | 1.08 | 4.09 | 1.07 |
| Selecting and/or developing trainings with variety of presentation methods | 4.20 | 0.97 | 4.05 | 1.01 |
| Involvement in implementation of USDA, FNS programs | 4.03 | 1.01 | 4.08 | 0.83 |
| Utilizing USDA Foods | 4.56 | 0.86 | 4.48 | 0.80 |
| Supervising line/tray presentation ¹ | 4.35 | 0.86 | 4.05 | 0.98 |
| Coordinating garden to cafeteria programs | 3.48 | 1.00 | 3.62 | 1.14 |
| Involvement in strategic planning | 3.80 | 1.03 | 3.92 | 1.11 |

Note: Scale 1 (*Strongly Disagree*) to 5 (*Strongly Agree*)

¹Difference statistically significant at $p < 0.05$

(Table 20 continues)

(Table 20 continued)

Job Duties and Responsibilities

| Attribute | SN Management (n = 105) | | Chef (n = 69) | |
|---|----------------------------|------|------------------|------|
| | Mean | SD | Mean | SD |
| Selecting and/or developing trainings with variety of presentation methods | 4.20 | 0.97 | 4.05 | 1.01 |
| Involvement in implementation of USDA, FNS programs | 4.03 | 1.01 | 4.08 | 0.83 |
| Utilizing USDA Foods | 4.56 | 0.86 | 4.48 | 0.80 |
| Supervising line/tray presentation ¹ | 4.35 | 0.86 | 4.05 | 0.98 |
| Coordinating garden to cafeteria programs | 3.48 | 1.00 | 3.62 | 1.14 |
| Involvement in strategic planning | 3.80 | 1.03 | 3.92 | 1.11 |
| Involvement in facility and capital improvement | 3.61 | 1.21 | 3.83 | 1.15 |
| Serving line efficiency | 4.26 | 0.80 | 4.18 | 1.00 |
| Performing hands-on food presentation | 4.47 | 0.80 | 4.30 | 0.91 |
| Engaging communities through special events, catering, and promotion | 4.17 | 1.05 | 4.15 | 1.08 |
| Using marketing tools and techniques to promote SNP and increase participation | 4.05 | 0.93 | 4.05 | 1.10 |
| Procuring equipment, basic equipment and preparation, and general maintenance | 3.45 | 1.22 | 3.71 | 1.20 |
| Updating and implementing Hazard Analysis and Critical Points (HACCP) and Standard Operating Procedures (SOP) | 3.92 | 1.12 | 4.15 | 1.05 |

Note: Scale 1 (*Strongly Disagree*) to 5 (*Strongly Agree*)

¹Difference statistically significant at $p < 0.05$

The second section of Part III asked respondents if the chefs performed these duties in the SNP. Respondents simply answered “yes” or “no.” The results of this section are given as percentages of “yes” responses in Table 21. The two highest performances for SN management were “Improving Food quality” (73.2%) and “Utilizing USDA foods” (70.7%). The two lowest were “Coordinating garden to cafeteria programs” (31.0%) and “Procuring equipment, basic equipment and preparation, and general maintenance” (33.6%). Chefs were highest on “Improving food quality” (83.3%) and “Speed scratch/scratch cooking” (81.9%). Chefs were lowest on “Production records training” (30.6%) and “Coordinating garden to cafeteria programs” (40.3%). The SN management and chefs differed significantly ($p < 0.05$) on three of the duties. School nutrition management responded that the duty of “Production records training” was performed by chefs more than the chefs reported that they performed the duty, chi-square (1)=7.9, $p < 0.05$. For “Batch cooking”, chi-square (1) = 4.7, $p < 0.05$, and “Speed scratch/scratch cooking,” chi-square (1) = 4.8, $p < 0.05$ chefs responded that they performed the duty more than SN management agreed that they did this.

Table 21

Duties Performed by Chef in SNP

| Duty | SN Management (n = 116) | | Chef (n = 72) | |
|--|----------------------------|------------|------------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Engaging student customers to identify customer preferences and expectations for the SNP, and to improve customer satisfaction | 77 | 66.4 | 56 | 77.8 |
| Menu planning | 71 | 61.2 | 51 | 70.8 |
| Improving food quality | 85 | 73.2 | 60 | 83.3 |
| Managing food cost | 62 | 53.4 | 46 | 63.9 |
| Developing standardized recipes | 67 | 57.8 | 53 | 73.6 |
| Production records training ¹ | 54 | 46.6 | 22 | 30.6 |
| Sourcing ingredients | 56 | 48.3 | 42 | 58.3 |
| Food production scheduling | 54 | 46.6 | 37 | 51.4 |
| Culinary training for SNP staff | 77 | 66.4 | 55 | 76.4 |

Note: Frequencies and percentages reported are of the respondents who checked “Yes” to duties performed.

¹Difference is statistically significant at $p < 0.05$.

(Table 21 continues)

(Table 21 continued)

Duties Performed by Chef in SNP

| Duty | SN Management (n = 116) | | Chef (n = 72) | |
|--|------------------------------------|-------------------|--------------------------|-------------------|
| | Frequency | Percentage | Frequency | Percentage |
| Batch cooking ¹ | 74 | 63.8 | 58 | 80.0 |
| Speed scratch/scratch cooking ¹ | 76 | 65.5 | 59 | 81.9 |
| Using and training on the operation of commercial kitchen equipment | 77 | 66.4 | 54 | 75.0 |
| Participating in local school wellness policy initiatives | 44 | 37.9 | 35 | 48.6 |
| Utilizing food buying guide | 56 | 48.3 | 43 | 59.7 |
| Managing volume production | 71 | 61.2 | 45 | 62.5 |
| Incorporating current trends | 74 | 63.8 | 53 | 73.6 |
| Involvement in food procurement process | 52 | 44.8 | 42 | 58.3 |
| Selecting and/or developing trainings with variety of presentation methods | 65 | 56.0 | 49 | 68.0 |
| Involvement in implementation of USDA, FNS programs | 57 | 49.1 | 45 | 62.5 |
| Utilizing USDA Foods | 82 | 70.7 | 54 | 75.0 |
| Supervising line/tray presentation | 70 | 60.3 | 46 | 63.9 |
| Coordinating garden to cafeteria programs | 36 | 31.0 | 29 | 40.3 |
| Involvement in strategic planning | 52 | 44.8 | 40 | 55.6 |
| Involvement in facility and capital improvement | 42 | 36.2 | 33 | 45.8 |
| Serving line efficiency | 75 | 64.7 | 44 | 61.1 |

Note: Frequencies and percentages reported are of the respondents who checked “Yes” to duties performed.

¹Difference is statistically significant at $p < 0.05$.

(Table 21 continues)

(Table 21 continued)

Duties Performed by Chef in SNP

| Duty | SN Management (n = 116) | | Chef (n = 72) | |
|---|----------------------------|------------|------------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| Performing hands-on food presentation | 79 | 68.1 | 52 | 72.2 |
| Engaging communities through special events, catering, and promotion | 73 | 67.9 | 46 | 63.9 |
| Using marketing tools and techniques to promote SNP and increase participation | 55 | 47.4 | 41 | 56.9 |
| Procuring equipment, basic equipment and preparation, and general maintenance | 39 | 33.6 | 36 | 50.0 |
| Updating and implementing Hazard Analysis and Critical Points (HACCP) and Standard Operating Procedures (SOP) | 63 | 54.3 | 44 | 61.1 |

Note: Frequencies and percentages reported are of the respondents who checked “Yes” to duties performed.

¹Difference is statistically significant at $p < 0.05$.

Part IV: School Nutrition Program Training for Chefs

Part IV of the questionnaire allowed the respondents to provide information on the chef’s training and experience prior to being hired and after being hired. With regard to training prior to being hired and after being hired, respondents checked “yes” or “no” to the topic areas. A rating of the importance of each training topic was also given using a scale of 1 (*Not Important*) to 5 (*Extremely Important*).

Training Prior to Being Hired. The majority of both SN management and chefs respondents checked “yes” to the areas of “Culinary skills,” “Developing and delivering effective training,” and “Procurement and inventory management.” (See Table 22.) The lowest skills were “Program administration,” “School nutrition policy,” “USDA Foods,” and “Meal patterns.” The only significant difference ($p < 0.05$) between the groups was in “Developing and delivering effective training,” chi-square(1) = 6.1, $p < 0.05$. For chefs, 75.0% responded that they possessed the skill prior to being hired, while only 51.7% of SF Management agreed that the chefs had the skill prior to being hired.

Table 22

School Nutrition Program Training for Chefs Prior to Being Hired

| Training Topic Area | SF Management (n = 116) | | Chef (n = 72) | |
|--|----------------------------|------------|------------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| School menu planning (cycle menus, presentation, etc.) | 29 | 25.0 | 23 | 31.9 |
| Meal Patterns (NSLP, SBP, FVP, USDA Foods, etc.) | 21 | 18.1 | 17 | 23.6 |
| Culinary Skills (SPECIFICALLY related to SN food) | 64 | 55.2 | 50 | 69.4 |
| School Nutrition Policy (Smart Snacks, wellness policy, safety) | 19 | 16.4 | 19 | 26.4 |
| Developing and delivering effective training (presentation skills, teaching adults, etc.) ¹ | 60 | 51.7 | 54 | 75.0 |
| Program Administration (NSLP, SBP, FFVP, etc.) | 16 | 13.8 | 15 | 20.8 |
| USDA Foods | 23 | 19.8 | 18 | 25.0 |
| Procurement and Inventory Management | 62 | 53.4 | 52 | 72.2 |

Note: Data represents the respondents who checked “Yes” to the training areas.

¹Differences are statistically significant at $p < 0.05$.

Training Received After Being Hired. Both SN management and chefs agreed on many of the trainings received after being hired. The highest agreement was on the areas of “Meal patterns,” School nutrition policy,” “School menu planning,” “USDA Foods,” and “Program administration.” (See Table 23.) Chefs responded lowest to “Culinary skills” (44.6%) and “Developing and delivering effective training” (44.6%). The two groups differed significantly ($p < .001$) on “Culinary skills,” chi-square(1)=13.9, $p < .001$, and “Developing and delivering effective training,” chi-square(1) = 10.4, $p < .001$. In both cases, over 50% of the SN management responded that chefs received this training after being hired, while only 40% of the chefs agreed that they received this training after being hired.

Table 23

School Nutrition Program Training for Chefs AFTER Being Hired

| Training Topic Area | SF Management (n = 116) | | Chef (n = 72) | |
|--|----------------------------|------------|------------------|------------|
| | Frequency | Percentage | Frequency | Percentage |
| School menu planning (Cycle menus, presentation, etc.) | 79 | 68.1 | 54 | 75.0 |
| Meal Patterns (NSLP, SBP, FFVP, USDA Foods, etc.) | 81 | 69.8 | 54 | 75.0 |
| Culinary Skills (SPECIFICALLY related to SN food) ¹ | 66 | 56.9 | 29 | 40.3 |
| School Nutrition Policy (Smart Snacks, wellness policy, safety) | 79 | 68.1 | 59 | 81.9 |
| Developing and delivering effective training (Presentation skills, teaching adults, etc.) ¹ | 64 | 55.2 | 29 | 40.3 |
| Program Administration (NSLP, SBP, FFVP, etc.) | 74 | 63.8 | 48 | 66.7 |
| USDA Foods | 78 | 67.2 | 52 | 72.2 |
| Procurement and Inventory Management | 67 | 57.8 | 43 | 59.7 |

Note: Data represents the respondents who checked “Yes” to the training areas.

¹Differences are statistically significant at $p < 0.05$.

Importance Ratings for Each School Nutrition Program Training Area. The same eight training program areas were rated on an importance scale of 1 (*Not important*) to 5 (*Extremely important*). The means are reported for each group in Table 24. Both groups rated all areas above four. The highest rating for both groups was for “meal patterns.” The ratings were 4.78 for SN management and 4.77 for chefs. The lowest rating for both groups was for “Program administration.” The means were 4.04 for SN management and 4.15 for chefs. There were no significant differences noted between the two groups.

Table 24

Importance of School Nutrition Program Training for Chefs

| Training Topic Area | SF Management (n = 116) | | Chef (n = 72) | |
|--|----------------------------|------|------------------|------|
| | Means | SD | Means | SD |
| School menu planning (Cycle menus, presentation, etc.) | 4.67 | 0.69 | 4.58 | 0.90 |
| Meal Patterns (NSLP, SBP, FFVP, USDA Foods, etc.) | 4.78 | 0.63 | 4.77 | 0.65 |
| Culinary Skills (SPECIFICALLY related to SN food) | 4.59 | 0.73 | 4.42 | 0.98 |
| School Nutrition Policy (Smart Snacks, wellness policy, safety) | 4.24 | 0.82 | 4.35 | 0.75 |
| Developing and delivering effective training (Presentation skills, teaching adults, etc.) ¹ | 4.31 | 0.86 | 4.29 | 0.86 |
| Program Administration (NSLP, SBP, FFVP, etc.) | 4.04 | 1.12 | 4.15 | 1.00 |
| USDA Foods | 4.25 | 0.87 | 4.32 | 0.86 |
| Procurement and Inventory Management | 4.23 | 0.90 | 4.33 | 0.87 |

Note: Scale 1 (*Not Important*) to 5 (*Extremely Important*).

Part V: Chef Success in School Nutrition Programs

Respondents were asked in Part V of the questionnaire to rate characteristics, qualities, and traits contributing to the success of chefs working in the SNP. The scale used ranged from 1 (*Not important*) to 5 (*Extremely important*). The comparisons of the means of the 20

characteristics are given in Table 25. The average of each item was above four on the 5-point scale for both groups. The chefs rated “Maintains a commitment to quality foodservice operations” the highest with a mean of 4.88. The SN management rated “Ability to work with diverse groups of people” the highest with a 4.84. There were no significant differences between the two groups on any of the characteristics.

Table 25

Importance of Chef Success in SNPs

| Characteristic | SF Management (n = 108) | | Chef (n = 69) | |
|--|----------------------------|------|------------------|------|
| | Mean | SD | Mean | SD |
| Ability to make appropriate decisions regarding menu planning, procurement, inventory management, food production, and service | 4.59 | 0.71 | 4.74 | 0.59 |
| Ability to motivate other SNP staff | 4.58 | 0.64 | 4.59 | 0.65 |
| Capability to employ time management skills | 4.64 | 0.61 | 4.71 | 0.60 |
| Ability to communicate well both orally and in writing with all stakeholders | 4.57 | 0.67 | 4.71 | 0.60 |
| Ability to maintain emotional control | 4.69 | 0.61 | 4.65 | 0.66 |
| Willingness to mentor SN staff | 4.52 | 0.73 | 4.65 | 0.61 |
| Willingness to network with other SN professionals | 4.31 | 0.84 | 4.41 | 0.81 |
| Ability to think critically in all aspects of foodservice operations | 4.61 | 0.64 | 4.78 | 0.48 |
| Maintains a commitment to quality foodservice operations | 4.78 | 0.54 | 4.88 | 0.40 |
| Maintains a positive attitude in the work environment | 4.81 | 0.48 | 4.77 | 0.52 |

Note: Scale 1 (*Very Negative*) to 5 (*Very Positive*)

(Table 25 continues)

(Table 25 continued)

Importance of Chef Success in SNPs

| Characteristic | SF Management (n = 108) | | Chef (n = 69) | |
|--|----------------------------|------|------------------|-------|
| | Mean | SD | Mean | SD |
| Fosters a positive atmosphere for employees and customers | 4.79 | 0.49 | 4.71 | 0.644 |
| Willingness to be mentored | 4.35 | 0.75 | 4.57 | 0.74 |
| Ability to delegate job duties and responsibilities to others | 4.41 | 0.83 | 4.59 | 0.63 |
| Promotes and practices quality customer service standards | 4.70 | 0.62 | 4.71 | 0.57 |
| Maintains active listening skills | 4.56 | 0.72 | 4.64 | 0.66 |
| Willingness to collaborate within and outside the local SNP | 4.27 | 0.82 | 4.51 | 0.74 |
| Shows respect for others | 4.81 | 0.56 | 4.84 | 0.50 |
| Ability to work with diverse groups of people | 4.84 | 0.46 | 4.80 | 0.50 |
| Willingness to be a life-long learner through continuing education opportunities | 4.56 | 0.71 | 4.58 | 0.74 |
| Ability to teach adults on a one-on-one basis and in groups | 4.45 | 0.75 | 4.51 | 0.76 |

Note: Scale 1 (*Very Negative*) to 5 (*Very Positive*)

Part VI: Impact of Chefs Working in School Nutrition Programs on Meal Quality Attributes

In part VI of the questionnaire, 14 statements measuring the chefs’ impact on meal quality attributes in the SNP were rated by the respondents using a five-point scale from 1 (*Very negative*) to 5 (*Very positive*). The means of these statements by each of the two groups are mentioned in Table 26. Only one statement was rated below a four by both groups of respondents. “Cafeteria ambiance” was rated at 3.82 by SN management and 3.81 by chefs. “Food taste” was rated the highest by both groups: chefs at 4.86 and SN management at 4.79. Again, there were no significant differences between the two groups on any of the impact statements.

Table 26

Impact of Chefs Working in SNPs on Meal Quality Attributes

| Attribute | SF Management (n = 105) | | Chef (n = 69) | |
|--------------------------------------|----------------------------|------|------------------|------|
| | Mean | SD | Mean | SD |
| Menu variety/variety of offerings | 4.68 | 0.55 | 4.75 | 0.50 |
| Customer satisfaction | 4.61 | 0.56 | 4.46 | 0.68 |
| Variety of fruits and vegetables | 4.34 | 0.76 | 4.42 | 0.70 |
| Plate waste | 4.07 | 0.82 | 4.03 | 0.87 |
| Food quality | 4.79 | 0.47 | 4.77 | 0.46 |
| Innovative recipe development | 4.62 | 0.63 | 4.74 | 0.56 |
| Menu innovations | 4.56 | 0.68 | 4.70 | 0.52 |
| Food presentation | 4.73 | 0.51 | 4.62 | 0.67 |
| Culturally diverse flavor profiles | 4.50 | 0.68 | 4.52 | 0.76 |
| Cafeteria ambiance | 3.82 | 0.87 | 3.81 | 0.88 |
| Food packaging and storage practices | 4.01 | 0.85 | 4.22 | 0.81 |
| Food taste | 4.79 | 0.43 | 4.86 | 0.36 |
| Food freshness | 4.64 | 0.59 | 4.70 | 0.58 |

| | | | | |
|---|------|------|------|------|
| Foods served at the appropriate temperature | 4.50 | 0.76 | 4.64 | 0.59 |
|---|------|------|------|------|

Note: Scale 1 (*Very Negative*) to 5 (*Very Positive*)

Part VII: Impact of Chefs Working in School Nutrition Programs on Program Operations and Activities

Using a scale of 1 (*Very Negative*) to 5 (*Very Positive*), respondents indicated the level of importance of the chefs’ impact on 32 program operations and activities in part VII of the questionnaire. (See Table 27.) Chefs rated “Use of scratch cooking” and “Kitchen efficiency” highest at 4.56. School nutrition management rated “Use of scratch cooking” highest at 4.58. Both groups rated “Labor costs and budgeting costs” the lowest at 3.74 for SN management and 3.60 for chefs. No significant differences were noted between the two groups. In fact, there was considerable agreement on these ratings between the groups.

Table 27

Impact of Chefs Working in SNPs on Program Operations and Activities

| Program Operations and Activities | SF Management (n = 105) | | Chef (n = 69) | |
|---|------------------------------------|-----------|--------------------------|-----------|
| | Mean | SD | Mean | SD |
| Student participation in school breakfast | 4.12 | 0.79 | 3.94 | 0.84 |
| Student participation in school lunch | 4.39 | 0.64 | 4.41 | 0.67 |
| Actively engaging students for SNP activities | 4.18 | 0.77 | 4.22 | 0.81 |
| Labor cost and budgeting costs | 3.74 | 0.95 | 3.60 | 0.84 |
| SN staff culinary techniques | 4.48 | 0.75 | 4.54 | 0.70 |
| Generating new sources of revenue | 3.85 | 0.93 | 3.84 | 0.86 |
| Administrator support | 4.10 | 0.87 | 3.94 | 0.84 |
| Teacher support | 3.81 | 0.94 | 4.41 | 0.67 |
| Student support | 4.15 | 0.89 | 4.22 | 0.81 |
| Community support | 3.96 | 0.92 | 3.60 | 0.84 |
| Safety and sanitation | 4.39 | 0.77 | 4.54 | 0.70 |

Note: Scale 1 (*Very Negative*) to 5 (*Very Positive*)

(Table 27 continues)

(Table 27 continued)

Impact of Chefs Working in SNPs on Program Operations and Activities

| Program Operations and Activities | SF Management (n = 105) | | Chef (n = 69) | |
|--|------------------------------------|-----------|--------------------------|-----------|
| | Mean | SD | Mean | SD |
| Branding SNP | 4.03 | 0.91 | 3.84 | 0.86 |
| Increase in use of USDA Foods | 4.20 | 0.84 | 3.94 | 0.84 |
| Inventory control | 4.08 | 0.84 | 4.41 | 0.67 |
| Cross utilization of current and new ingredients | 4.49 | 0.68 | 4.47 | 0.74 |
| Customer service | 4.40 | 0.73 | 4.42 | 0.74 |
| Supporting and planning student experiences with new foods | 4.48 | 0.67 | 4.50 | 0.72 |
| Marketing to attract new students | 4.17 | 0.91 | 4.12 | 0.80 |
| Marketing to retain students | 4.19 | 0.81 | 4.06 | 0.83 |
| Development of SNP branded food products | 4.03 | 0.91 | 4.06 | 0.90 |
| Credibility to SNP | 4.32 | 0.78 | 4.35 | 0.84 |
| Organized, standardized recipes and procedures | 4.33 | 0.77 | 4.52 | 0.68 |
| Food procurement practices | 3.86 | 0.83 | 3.94 | 0.83 |
| SN staff morale | 4.33 | 0.79 | 4.25 | 0.78 |
| Food purchasing practices | 3.88 | 0.85 | 3.96 | 0.91 |
| Use of scratch cooking | 4.58 | 0.65 | 4.56 | 0.72 |
| Cost efficiency | 4.12 | 0.86 | 4.15 | 0.74 |

Note: Scale 1 (*Very Negative*) to 5 (*Very Positive*)

(Table 27 continues)

(Table 27 continued)

Impact of Chefs Working in SNPs on Program Operations and Activities

| Program Operations and Activities | SF Management (n = 105) | | Chef (n = 69) | |
|--|------------------------------------|-----------|--------------------------|-----------|
| | Mean | SD | Mean | SD |
| Serving line efficiency | 4.26 | 0.85 | 4.21 | 0.82 |
| Kitchen efficiency | 4.47 | 0.74 | 4.56 | 0.61 |
| SN staff efficiency | 4.29 | 0.78 | 4.32 | 0.74 |
| Safety and sanitation | 4.41 | 0.79 | 4.52 | 0.68 |
| Incorporating local foods | 4.34 | 0.86 | 4.38 | 0.90 |

Note: Scale 1 (*Very Negative*) to 5 (*Very Positive*)

Comparisons

To further examine SN management and chefs, the Likert-type questions in parts III, C, VI, and VII were analyzed for significant differences by years of experience in SNP, total enrollment in the school district, and the number of sites served using one-way ANOVAs. No significant differences were found using any of the variables. Again, there appear to be more similarities than differences within the responses of both chefs and SN management.

CONCLUSIONS

The purpose of this research was two-fold: (a) to explore the role and impact of a chef on the SNP's operations from the perspectives of SN administrators, SN managers, and SN chefs, and (b) to develop and execute a national survey to confirm finding for the aforementioned purpose. Perceptions of SN directors and administrators, SN supervisory staff, and school and State agency level chefs were assessed in this study to understand what similarities and differences exist regarding the role and benefit of the SN chef. Overall, both SN management and chefs participating in the research responded similarly in each of the identified areas being evaluated, with a few exceptions.

Recruiting, Hiring, and Retaining Chefs

The culinary profession is a diverse and labor-intensive career market. It requires the employment of competent staff, the dedication of foodservice staff, restaurant operations, food manufacturing, catering, and hospitality to offer quality food and services to consumers with global palates and experiences with food beyond what was common in previous years (Suhairom et al., 2019). As the palates of the general consumer have evolved, so has the hospitality industry. One role of this study was to investigate the recruitment and retention efforts by SFAs to acquire and maintain qualified chefs.

The SNP workforce is like the hospitality industry workforce. In fact, they are one and the same with customers who are well versed in the current landscape of gastronomy and the food culture due to greater access to restaurant foods and greater access to the concept of well-prepared foods from celebrity chefs through television networks and social media outlets. As a facet of the hospitality industry, SNPs face similar challenges to any other hospitality component. One of the major challenges the hospitality industry faces is a shortage of skilled talent. While we are continuing to see growth in this industry, identifying qualified staff is still difficult (EHL Insights, n.d.; ManpowerGroup, 2018).

Required and Preferred Qualifications for Hiring

According to the U.S. Bureau of Labor Statistics, one may become a chef through education, work experience, or special training. In either case, a high school diploma or equivalent may be required for an individual to become a chef (*Bureau of Labor Statistics*, n.d.). In this study, SNP directors were asked to provide the required and preferred qualifications used to hire chefs in the local SNP. The majority of the respondents (88.4%) required chef applicants to have a high school diploma or GED and a food safety certification (76.8%). More directors preferred chefs with experience in SNPs (44.2%) and culinary certification (55.7%) than those who require those qualifications. Also, more directors preferred the chef applicants to have a culinary degree (60%) over a bachelor's degree (44.2%) or an associate's degree (34.7%) in other fields of study. These requirements and preferences may be in line with what is expected in other areas of the hospitality industry. Generally speaking, chefs participating in the research found in the current literature have reported varied credentials. Of the chefs participating in the study by Zopiatis (2010) conducted in Cyprus, 31.5% had high school diplomas and 52.8% had two-year college degrees. Of the chefs participating in the study by Allen and Mc Con Iomaire

(2017) conducted in the Republic of Ireland, 11.2% had high school diplomas, 18.8% had completed apprenticeships, and 35.3% had a degree. In studies conducted in the US, similar data were found. Researchers investigating chef turnover and burnout among members of the American Culinary Federation (ACF) reported that 0.3% of respondents had a high school diploma, 8.6% of respondents had post-secondary non-degrees, 8.2% of the respondents had a technical/culinary arts diploma, 13.1% had an associate's degree, and 45.4% had a bachelor's degree (Kang, B., Twigg, M.W., and Hertzman, J., 2010). These respondents also indicated that 84.1% were ACF certified, 14.6% were certified personal chefs, and 73.6% were ServSafe certified (Kang, B., Twigg, M.W., and Hertzman, J., 2010). In Bissett, Cheng, and Brannan's (2010) research on the level of competence and the importance of competence to job success among members of the Research Chef Association (RCA), 1% of the respondents had a high school diploma, 16% had an associate's degree, and 41% had a bachelor's degree.

Turnover

Overall, the global hospitality industry has grown significantly over the last ten years, contributing an estimated "8.8 trillion US dollars to the global economy in 2018" (EHL Insights, n.d.). The National Restaurant Association reports that the total economic impact of the restaurant industry in the US is more than \$2.5 trillion (National Restaurant Association, n.d.). According to the US Bureau of Labor Statistics, chef and head cook positions are expected to grow by six percent by 2029 (*Bureau of Labor Statistics*, n.d.). Even though the chef and head cook positions are expected to grow, there is still a significant amount of turnover in the restaurant and hospitality industry. According to the National Restaurant Association, turnover rates in the restaurant-and-accommodation sector were 74.9% in 2018 (National Restaurant Association, 2019).

Labor turnover is defined as "the movement of people in and out of employment within an organization," and can be at the will of the individual or forced (Abdullah et al., 2010). In the current study, 35.4% of SN management, 33.3% of chefs reported the frequency of turnover in the chefs' position at one or more chefs in the past five years. There is no direct data that address the turnover rates of chefs in the literature. Based on national data for the industry, however, the percent turnover among chefs working in SNPs in the past five years is less than that which is reported nationally for the entire restaurant industry.

The chef's profession has been perceived as infamous for its occupational issues (Tongchairpraisit & Ariyabuddhiphongs, 2016). Zopiatis et al. (2011) identified five areas of importance related to occupational issues among chefs: training and development; salary, financial rewards, and fringe benefits; acknowledgment and appreciation from upper-level management; quality of the work environment; and job security. The current study examined the factors that influenced the chef turnover rate in SNPs. As for the potential factors that influence chef turnover, both chefs and SN management agreed that (a) chef not adapting to the SNP culture, (b) chef desiring higher salaries, (c) chefs leaving for career advancements, (d) lack of freedom in menu planning and preparation, and (e) leaving for non-school career opportunities had an impact on chefs leaving an SNP.

The findings in the current study concurred with the literature related to reasons for chef turnover. In a study conducted by Tongchaiprasit and Aryabuddhiphongs (2016), creativity, defined as the “use of ingredients that blend harmoniously in the preparation of dishes that look beautiful, taste delicious and fulfill the customer’s dreams,” had an indirect effect on chef turnover intention by way of job stress. There are two things we can assume that make these findings support the findings in the current study. First, the inability to adapt to a specific job culture can result in job stress. Second, the inability to exercise freedom in menu planning and preparation, likely due to SNP guidelines and regulations for school meals may suppress a chef’s desire to be creative. Another study found that the four main factors impacting turnover among chefs working in hotels in Malaysia were (a) relationship with their superior, (b) salary, (c) education, and (d) time on the job (those who have been on the job for 2-5 years were more likely to leave than those who were on the job for less than two years or more than five years) (Abdullah et al., 2010). All the reasons for turnover identified in the current study are similar to those identified in studies related to the restaurant industry. The findings lend themselves to a reassessment of the hiring practices and human resource management practices in SNPs.

Benefits and Challenges of Hiring a Chef

There are benefits and challenges to hiring staff at any level. Identifying and hiring qualified chefs in SNPs is no different. This study examined the possible reasons for hiring a chef in an SNP and the challenges of hiring a chef. Overall, both SN management and chefs had a positive perception of the reason why chefs should be hired in SNPs. All respondents agreed that chefs: (a) elevated flavor profiles of school meals and recipes, (b) developed creative and innovative school menus and recipes, (c) integrated different styles of cooking to enhance school menus and recipes, (d) increased the efficiency of food production in school kitchens, (e) enhanced the reputation and public perception of SNPs, (f) develop standardized recipes for the district, (g) enhanced the food quality of school meals, (h) improved the workplace safety for SNP and employees, and (i) improved menu planning and food production processes to minimize food waste and increased sustainability. A pilot study by Cohen et al. (2012) confirms the findings of this study on a chef’s impact on school meal consumption and food quality for middle school children. The study by Cohen et al. (2012) used a Chef Initiative to bring in a chef to local SNPs to train cafeteria staff to prepare healthier, tastier meals. The study compared outcomes between schools with the Chef Initiative to schools that did not have the Chef Initiative operating in their cafeterias. The study found that students at schools where chef-inspired meals were prepared took significantly more whole grain entrée/and or sides than students from the control schools (85.7% versus 34.7%, $p = 0.02$), ate significantly more vegetables (0.36 more vegetables, $p = 0.01$) than the students at the control school, and ate more side dishes than the control school students (74.6% versus 29.2%, $p < 0.0001$). As it relates to food quality, this study showed that the chef-inspired meals had 3.6 g ($p < 0.0001$) higher fiber than the control school and 284 MG ($p < 0.0001$) less sodium than the control school. This study showed that the enhancements from the chef training and chef support in the school cafeteria resulted in creating innovative recipes, enhanced food quality, and minimized food waste.

Challenges of hiring a chef were also explored in the current research study. Both SN management and chefs indicated “lack of knowledge related to USDA meal planning requirements for SNPs” as the greatest challenge of hiring a chef in the SNP. Moreover, both SN management and chefs collectively identified four more top challenges of hiring a chef (a) lack of funds to support a chef position, (b) lack of awareness of SNP career opportunities, (c) lack of career advancement SNPs, and (d) lack of support of school administrators to recruit and hire a chef. It is interesting to note that issues identified in the challenges of hiring a chef in an SNP often parallel the issues associated with job turnover for this population.

Job Duties and Responsibilities

Job duties and responsibilities in this study refer to actual job duties performed by chefs working in SNPs. This study sought to identify the importance of an SN chef's specific job duties and responsibilities. The findings show that both SN management and chefs agreed that the job duties and responsibilities provided on the survey were important activities that the chef would perform on a day-to-day basis. More specifically, both SN management and chefs gave “improving food quality” the highest rating among all duties, confirming the finds in the study by Cohen et al. (2012) on the chef's potential impact on food quality in SNPs. When asked to verify that chefs performed the job duties, there was some indication that chefs in the local SNP performed the job duties listed. There was some discrepancy in reporting. More SN management reported chefs providing “production record training” than chefs reported that they performed that duty. Chefs reported utilizing specific cooking techniques, “batch cooking” and “speed scratch/scratch cooking,” more than SN management reported. These differences can be attributed to the difference in expectations between SN management and chefs.

Training

The current study looked at chefs' experience or training in specific topic areas before and after being hired at an SNP. Findings indicated that the majority of SN management and chefs agreed that prior to being hired, chefs had limited knowledge about “program administration,” “nutrition policy,” “USDA Foods,” and “meal patterns.” This finding seems to be in line with what was shared in phase one of the project and with the fact that in-depth knowledge of an SNP is not typically a part of a standard chef curriculum.

Chef Success in School Nutrition Programs

A small number of researchers have explored the use of competencies, knowledge, skills, and abilities to identify what it takes to have a successful career as a chef (Allen & Mac Con Iomaire, 2017; Birdir & Pearson, 2000; Bissett, Cheng, & Brannan, 2010; Hu, 2010; Suhairom et.al, 2019; and Zopiatis, 2010). Allen and Mac Con Iomaire (2017) defines what it means to experience career success through two measures: objective and subjective career success. Objective career success considers those things that are measurable or verifiable, such as pay rate, job status, or competencies (knowledge, skills, and abilities). Subjective career success is derived from personal perceptions of success or accomplishment, such as job satisfaction, expertise, and future opportunities (Allen & Mac Con Iomaire, 2017). In an effort to examine the qualities, abilities, and assets needed to succeed in the culinary industry of Ireland, Allen and

Mac Con Iomaire (2017) surveyed head chefs working in Irish kitchens. The results indicated that chefs rated the following as the top four traits necessary for success and high in personal ownership for chef success: (a) “commitment to quality,” (b) “knowledge of HACCP,” (c) “ability to work hard,” and (d) “knowledge of flavor” (Allen & Mac Con Iomaire, 2017). These traits are also found in other literature on career success (Birdir and Pearson, 2000; Bissett, Cheng, and Brannan, 2010; Hu, 2010).

In the current study, the researcher sought to identify the importance of specific characteristics, qualities, and/or traits on a chef's success working in an SNP. Of the 20 characteristics, qualities, and/or traits, all were rated as moderately important or extremely important. These characteristics include (a) “ability to make appropriate decisions regarding menu planning, procurement, inventory management, food production, and service”; (b) “maintains a commitment to quality foodservice operations”; (c) “ability to delegate job duties and responsibilities to others”; and (d) “promoted and practices quality customer service standards”. Based on the previous studies' findings, foundational competencies, knowledge, skills, and abilities needed for chef success in the general hospitality industry are analogous to those required for chef success in the SNP (Allen & Mac Con Iomaire, 2017; Birdir & Pearson, 2000; Bissett, Cheng, & Brannan, 2010; Hu, 2010; Suhairom et.al, 2019; and Zopiat, 2010).

Impact of a Chef on Meal Quality Attributes and Program Operations

One of the objectives of this current research was to identify the impacts that chefs have on SNPs and their operations. To define the impact of chefs on meal quality attributes, respondents were asked to indicate the level of impact chefs had on 14 meal quality factors. Both SN management and chefs agreed that chefs had a slightly positive or very positive effect on each of the meal attributes. There was only one meal attribute that both groups rated below slightly positive, and that meal attribute was cafeteria ambiance. Both groups agree that the layout and design of the cafeteria were not directly affected by the SN chef.

There were no studies identified in the literature review to directly address the impact a chef has on SN meal attributes and SN program operations and activities. However, there are a few studies that show the outcomes of chef interventions on school-aged children. Cohen et al. (2015) and Cohen et al. (2019) conducted quasi-experimental cafeteria-based studies with elementary and middle school-aged children to address the impact of a chef-enhanced meal, paired with either the removal of flavored milk or the use of choice architecture, on healthier food selection and school meal consumption. Results of the 2015 study indicated long-term exposure (7-month period of exposure) to chef-enhanced meals, increased fruit and vegetable selection and consumption among school-aged children (Cohen et al., 2015). In the study by Cohen et al. (2019), the results were similar to that of Cohen et al. (2015). Students in chef-based schools consumed significantly more fruits and vegetables than those in the control schools. Both studies corroborate the perceived impact of chefs on SNP meal attributes expressed in the current study. Based on these findings, having a chef involved in menu planning, recipe development, and staff training can impact customer satisfaction, food quality, plate wastes, food taste, and menu variety among school-aged children.

To assess the impact of the chef on SNP program operations, SN management and chefs were asked to indicate the level of impact chefs have on 32 program operations and activities. Most of the program operations and activities were viewed as having been positively impacted by the SN chef. Only one program activity, labor costs and budgeting costs, was viewed as chefs having a less than slightly positive impact. This finding is comparable to that which is found in the literature. In most chef competency assessment research, chefs' competence in labor cost and budget costs are not identified as "high in importance" (Bissett, Cheng, & Brannan, 2010; Hu, 2010; Zopiatis, 2010).

RECOMMENDATIONS

The current study aimed to extend the body of knowledge regarding the job duties and functions of chefs working in SNPs, hiring requirements including educational attainment and work experience for chefs working in the SNP, and the impact of chefs on SNP operations, specifically meal quality attributes and program operations and activities. At present, there is little to no research looking at job functions and duties, competencies, and impact of chefs in SNP operations. Overall, the outcomes from this research are expected to have a positive impact on a theoretical and practical level. Theoretically, this research is the first of its kind to provide a groundwork for a chef to be successful in school nutrition. From an academic perspective, this study may shed some light on the knowledge, skills, and abilities needed for current and future chefs interested in the child nutrition professions. On a practical level, this study has generated meaningful information to guide school food authorities in recruiting and hiring chefs, retaining chefs, and identifying knowledge, skills, and abilities needed by chefs to be successful in SN operations.

One of the major findings in this study is the positive impact chefs have on meal quality attributes and program operations and activities and the identification of job duties of chefs, which are tied to competencies for chefs identified in other research. Therefore, it would be worthwhile to undertake an additional investigation into the knowledge, skills, and abilities needed for a chef to be successful in an SNP and to build a competency model and resource that addresses the needs of chefs working in SNPs. From this, several outcomes could be attained: (a) culinary schools could develop a model for culinary professional development in the area of Child Nutrition Programs to enhance the degree program, (b) SN management would have a guide for hiring, training, and evaluating chefs, as well as the enhance continuing education efforts, and (c) chefs and aspiring chefs, could use the competency information to get equipped with the requisite knowledge, skills, and abilities to pursue a culinary career in Child Nutrition Programs.

Another key finding in this study is related to the efforts required to attract and retain qualified and interested chefs to the SNP. Consequently, the outcomes of this study could be used to (a) develop an SFA hiring toolkit for chefs, which could include hiring guideless for the position, job duties (position description) that align with the CKS, job posting /marketing strategies, onboarding guide; (b) develop an “onboarding” course for SN chefs that covers, NSLP/SBP regulations, how to train SN foodservice workers, how to mentor SN foodservice workers, how to use the *Food Buying Guide and Recipe Analysis Workbook*, & Standardized Recipe Development; (c) develop an SN Chef mentor program which could involve existing SN chefs who would mentor new SN chefs as they complete the onboarding process.

It is evident from this project's findings that chefs play a vital role in SNP operations, as both SN chefs and SN management agreed that chefs have a significant impact on meal quality and overall program operations. Therefore, SFAs must understand the best methods to recruit and retain qualified chefs and the best ways to encourage chef success. The information gained from this project will assist the ICN, USDA, State agencies, and training professionals in developing the appropriate recruitment tools, training resources, mentoring opportunities, professional development opportunities, and performance assessments for chefs working in SNPs.

REFERENCES

- Allen, H., & Mac Con Iomaire, M. (2017). Secrets of a Head Chef: Exploring factors influencing success in Irish kitchens. *Journal of Culinary Science and Technology*, 15, 187-222.
- Baxter, P. & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544-559.
- Birdir, K., & Pearson, T. E. (2000). Research chefs' competencies: A Delphi approach. *International Journal of Contemporary Hospitality Management*, 12, 201-209.
- Bissett, R. L, Cheng, M. S. H., & Brannan, R. G. (2009). A qualitative assessment of culinary science competencies defined by the Research Chefs Association. *Journal of Culinary Science and Technology*, 7, 285-293.
- Bissett, R. L, Cheng, M. S. H., & Brannan, R. G. (2010). A quantitative assessment of the Research Chefs Association core competencies for the practicing culinologist. *Journal of Food Science Education*, 9, 11-18.
- Bureau of Labor Statistics, U. S. Department of Labor. (n.d.). Occupational Outlook Handbook, Chefs and Head Cooks. <https://www.bls.gov/ooh/food-preparation-and-serving/chefs-and-head-cooks.htm>
- Cater, J. B. & Carr, D. H. (2006). *Competencies, knowledge, and skills of effective school nutrition managers*. (R-106-06). University, MS: National Food Service Management Institute.
- Cater, J. B. & Carr, D. H. (2007). Updating competencies, knowledge, and skills necessary for effective school nutrition managers in their current work. *The Journal of Child Nutrition and Management*, 31(1).
<http://docs.schoolnutrition.org/newsroom/jcnm/07spring/cater/index.asp>
- 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.
- Cohen, J. F. W., Richardson, S. A., Cluggish, S. A., Parker, E., Catalano, P. J., & Rimm, E. B. (2015). Effects of choice architecture and chef-enhanced meals on the selection and consumption of healthier school foods: A randomized clinical trial. *JAMA Pediatrics*, 169, 431-437.
- Cohen, J. F. W., Richardson, S., & Rimm, E.B. (2019). Impact of the updated USDA school meal standards, chef-enhance meals, and the removal of flavored milk on school meal selection and consumption. *Journal of the Academy of Nutrition and Dietetics*, 119, 1511-1515.

- Cohen, J.F.W., Smit, L. A., Parker, E., Austin, B., Fraizer, L., Economos, C.D., & Rimm, E.B. (2012). Long-term impact of a chef on school lunch consumption: Findings from a 2-year pilot study in Boston middle schools. *Journal of the Academy of Nutrition and Dietetics*, 12, 927-933.
- Giousmpasoglou, C., Marinakou, E., & Cooper, J. (2016, October). *Chef's future competencies needs in the UK: the stakeholder's perspectives*. EuroCHRIE, Budapest. https://www.researchgate.net/publication/308413854_Chefs%27_future_competencies_needs_in_the_UK_the_stakeholders%27_perspectives
- EHL Insights (n.d.) *Hospitality industry: All your questions answered*. Hospitality News and Business Insights by EHL. <https://hospitalityinsights.ehl.edu/hospitality-and-tourism-industry>
- Hu, M. (2010). Discovering culinary competency: An innovative approach. *Journal of Hospitality, Leisure, Sport and Tourism Education*, 9, 65-72.
- Kang, B., Twigg, N. W., & Hertzman, J. (2010). An examination of social support and social identity factors and their relationships to certified chef's burnout. *International Journal of Hospitality Management*, 29, 168-176.
- ManpowerGroup. (2018). *Solving the talent shortage: Build, buy, borrow, and bridge*. Milwaukee, Wisconsin: ManpowerGroup. <https://go.manpowergroup.com/talent-shortage-2018>
- National Conference of State Legislatures. (2011, March 24). *Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) Summary*. <https://www.ncsl.org/research/human-services/healthy-hunger-free-kids-act-of-2010-summary.aspx>
- National Restaurant Association. (2019, May 9). *Hospitality industry turnover rate ticked higher in 2018*. <https://restaurant.org/articles/news/hospitality-industry-turnover-rate-ticked-higher>
- National School Lunch Program: Participation and Lunches Served. (n.d.). <https://fns-prod.azureedge.net/sites/default/files/resource-files/slsummar-7.pdf>
- National Restaurant Association. (n.d.) *2020 State of the restaurant industry: The essential resource for the restaurant industry* [Fact Sheet]. <https://restaurant.org/research/restaurant-statistics/restaurant-industry-facts-at-a-glance>
- Tongchaiprasit, P., & Ariyabuddhiphongs, V. (2016). Creativity and turnover intention among hotel chefs: The mediating effects of job satisfaction and job stress. *International Journal of Hospitality Management*, 55, 33-40.
- School Breakfast Program Participation and Meals Served. (n.d.). <https://fns-prod.azureedge.net/sites/default/files/resource-files/sbsummar-3.pdf>

- School Meal Trends & Stats. (n.d).
<https://schoolnutrition.org/AboutSchoolMeals/SchoolMealTrendsStats/>
- School Nutrition Association. (2012, February 10). *School nutrition association leading new chefs move to schools coalition* [Press release]. <https://schoolnutrition.org/5--news-and-publications/2--press-releases/press-releases/school-nutrition-association-leading-new-chefs-move-to-schools-coalition/>
- Schwartz, C. & Wootan, M.G. (2019). How a public health goal became a national law: The Healthy, Hunger-Free Kids Act of 2010. *Nutrition Today*, 54, 67-77.
- Suhairom, N., Musta'amal, A. H., Amin, N.F. M., Kamin, Y, & Wahid, N. H. A. (2019). Quality culinary workforce competencies for sustainable career development among culinary professionals. *International Journal of Hospitality Management*, 81, 205-220.
- The White House, Office of the First Lady. (2010, February 9). *First Lady Michelle Obama launches Let's Move: America's move to raise a healthier generation of kids* [Press release]. <https://obamawhitehouse.archives.gov/the-press-office/first-lady-michelle-obama-launches-lets-move-americas-move-raise-a-healthier-genera>
- Yin, R. (2003). *Applications of case study research*. (2nd ed). Thousand Oaks, CA: Sage Publications, Inc.
- Zellner, D. A., & Cobuzzi, J. L. (2017). Eat your veggies: A chef-prepared, family style school lunch increases vegetable liking and consumption in elementary school students. *Food Quality and Preference*, 55, 8-15.
- Zopiatis, A. (2010). Is it art or science? Chef's competencies for success. *International Journal of Hospitality Management*, 29, 459-467.
- Zopiatis, A, Kyprianou, G., & Pavlou, I. (2011). Occupational challenges facing chefs: The case of Cyprus. *Journal of Quality Assurance in Hospitality and Tourism*, 12, 104-120.



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