

SCHOOL NUTRITION PROFESSIONALS PERCEPTIONS OF KEY PERFORMANCE INDICATORS

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ABSTRACT

The purpose of this study was to explore school nutrition (SN) professionals' perceptions of key performance indicators (KPIs). An expert panel of SN professionals helped develop a national survey. The survey was sent to a random sample of 700 SN professionals stratified by USDA region. The response rate for the survey was 29.3% (N=205). The results indicated that most SN professionals perceive they have an adequate understanding of standard SN KPIs. Most SN professionals feel KPIs are easy but time consuming to use. Results of this study suggest the need for the development of KPI training and resources to support SN professionals.

Keywords: key performance indicator (KPI), productivity, and data driven decision making

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INTRODUCTION

School nutrition (SN) management is a challenging profession, fraught with continually changing regulations, limited budgets, and a demanding customer base. Thriving in this environment requires savvy decision making. Effective SN professionals must be able to reasonably determine the best use of their time and resources. They need to know where costs can be reduced, where revenues can be increased, and how to evaluate the impact of their efforts. Data driven decision making, utilizing key performance indicators (KPIs), meets this need.

Data driven decision making is the process of using operational data, commonly collected by SN programs, to make informed decisions about planning and implementing change (Boettger, 2009). The operational data that is used to track the most important aspects of a SN operation are called KPIs (Boettger, 2009). Fahey (2011) described KPIs as measures of performance that allow school officials to identify problem areas, measure progress in correcting these problems, and demonstrate program efficiency and effectiveness. Buzalaka (2010) described KPIs as metrics that allow SN professionals to utilize a rigorous numbers oriented approach to target specific areas of emphasis and gauge results in an objective and measurable way. KPIs can be used to help identify where resources should be invested to have the most positive impact (such as equipment or labor), and they can be used to track the progress of major initiatives (such as breakfast in the classroom, salad bars, and farm to school) on participation, cost, and revenue (Buzalaka, 2010).

Several KPIs that are useful for decision making in SN programs have been identified in literature. That list includes costs per revenue (e.g., food, labor, supply, equipment, other, and total), fund balance as a percent of revenue, breakfast and lunch participation rates (by grade and school), meals per labor hour, costs per meal (food, labor, supply, equipment, other, and total), inventory on hand, and revenue per student. (Boettger, 2009; Council for Great City Schools, 2012; and Cater et al., 2005).

School nutrition industry professionals suggest that effective utilization of KPIs requires specific attributes of the individuals using the KPIs, as well as specific characteristics of the SN program where there KPIs are being utilized. The individual attributes include an understanding of financial management and good business acumen. The program characteristics include the existence of operational systems for data gathering and analysis, and a compatible database of comparable statistics against which KPIs can be measured and benchmarked (Buzalaka, 2010).

In 2009, Boettger suggested that most SN professionals spend a considerable amount of time and resources collecting data, but far less time analyzing this data to make wise decisions. Currently, there is a lack of research concerning SN professionals' perceptions of KPIs as a tool to support SN program management. Therefore, the purpose of this study was to explore SN professionals' perceptions of KPIs.

METHODOLOGY

Research Plan

This project, which received approval from the Institutional Review Board at The University of Southern Mississippi prior to implementation, was conducted in three phases. In Phase I, the primary investigator visited a SN program where the director had demonstrated success in utilizing KPIs for operational decision making. In Phase II, an expert panel of SN professionals experienced in applying KPIs was convened to discuss issues associated with utilizing KPIs in SN programs. The intent of Phase I and II of the study

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was to gather information to support the development of a national survey to meet the objectives of the study. In Phase III, a national survey was developed and validated with the assistance of a review panel of SN professionals. The survey was then mailed to a random sample of 700 SN directors representing the seven United States Department of Agriculture (USDA) regions.

Phase I: Site Visit - A location for the site visit was identified by contacting two state agency child nutrition directors and asking for recommendations of SN directors who demonstrate excellence in utilizing KPIs for operational decision making. Two SN directors were recommended by state agency directors to participate in site visits, of those, one agreed to participate in this study. The site visit consisted of structured interviews with the SN director and SN managerial staff, and a tour of the SN program to view routine operations. During the structured interviews, the following information was gathered: the specific KPIs used by various levels of SN staff members; the frequency KPIs are calculated; how KPIs are utilized; the strengths/advantages of using each KPI; and the barriers/disadvantages of using each KPI. The tour of the SN operation included visits to several schools in the district to observe how and what data were captured for calculating KPIs.

Phase II: Expert Panel - Potential participants for the expert panel in Phase II were also identified by contacting state agency child nutrition directors for recommendations. From this list, 14 SN program directors and one state agency child nutrition director were selected based on three criteria: representation from each USDA Region, and a good distribution based school district student enrollment levels and the percentage of students approved for free and reduced priced meals. One state agency child nutrition director and nine SN directors agreed to participate.

Prior to conducting the expert panel, discussion topics for the meeting were expanded from the question used in the site visit interviews based on information gained from the site visit, the research objectives, and previous research.

The expert panel session was conducted at the Institute of Child Nutrition, Applied Research Division (ICN, ARD) located on the campus of The University of Southern Mississippi in Hattiesburg, Mississippi. The agenda established for the expert panel was designed to address the issues outlined in the research objectives so that discussion supported the development of a survey to be utilized in Phase III of the study. Throughout the session, participants were asked semi-structured, open-ended questions related to the research objectives. A structured approach was employed to keep the discussion on target. The expert panel was moderated by one researcher, while an additional researcher captured participant comments on a computer. Toward the end of the session, after all questions were discussed, the moderator summarized responses, and participants were asked to verify the accuracy of the depiction of the discussion summation. Afterwards, the responses recorded during the expert panel were incorporated into statements that were utilized to develop the quantitative survey instrument.

Phase III: Survey development - In Phase III of the study, themes identified from the qualitative data collected from the expert panel discussions were used to develop a survey instrument. The survey, *Key Performance Indicators for Measuring Productivity in School Nutrition Programs*, consisted of 105 multiple choice questions divided into the following two sections: "Your Opinion" and "Personal/Program Characteristics".

The "Your Opinion" section of the survey contained nine sets of questions, which are described below. In several of these question sets, respondents were asked information concerning 11 standard SN KPIs including: Meals per Labor Hour, Cost as a Percent of Revenue, Cost per Meal, Revenue per Meal, Inventory Turnover Rate, Days of Inventory On-Hand, Average Daily Participation, Percent Over Production, Breakeven Point, Staff Turnover Rate, and Absentee Rate. In one question set respondents were asked to rate their level of understanding of each SN KPI based on a three-point scale ranging from 1 (*no understanding*) to 3 (*adequate*). The second question set, respondents were asked to indicate if they have access to the necessary data to calculate each SN KPI. In a third question set asked respondents to rate their level of agreement with 12 statements pertaining to the value and ease of use of SN KPIs. The four-point rating scale for the ninth question ranged from 4 (*strongly agree*) to 1 (*strongly disagree*).

The "Personal and Program Characteristics" section of the survey contained 21 questions. Examples of data gathered regarding personal characteristics included respondent's position title, level of education, certification status, years of experience in their current position, and prior work experience. Examples of data gathered pertaining to SN program characteristics included: school district enrollment size, level of food processing (scratch vs. premade), level of disposable dishes vs. machine washables, location of the school district, percentage of students approved for free and reduced-price meals, and percentage of average daily participation.

Survey validation: review panel - A group of 57 SN professionals were asked via e-mail to participate in a review panel to evaluate the draft survey. This group consisted of expert panel members and SN professionals who were referred by state agency child nutrition directors to participate in the expert panel. The e-mail invitation contained instructions explaining the review process, and included the following attached documents: an informed consent form, a draft survey cover letter, a draft survey instrument, and an evaluation form. The instructions asked recipients to read each of the attached documents, complete the evaluation, and return the evaluation form via e-mail or fax within two weeks. The evaluation form contained 15 questions/statements to assess the readability, clarity, and flow of the survey cover letter and survey instrument. Additional space was provided on the evaluation form for reviewers to provide comments and suggestions to revise the cover letter, survey statements, and response categories. A reminder e-mail was sent to all recipients one week prior to the deadline. Return of the evaluation form served as consent to participate in the review process. Twenty-one (37%) evaluation forms were returned.

Revisions were made based upon comments and suggestions offered by the reviewers. The survey instrument used in this study was produced in a scannable form, using Magenta 5.0 Forms Designer software. This program creates scannable forms which allow participants to record their responses using a number two pencil. Surveys may then be scanned using Remark Classic OMR 2.5 software and directly transferred to a statistical program for analysis. Survey Sample and Distribution

Survey Sample

The study sample was selected from the database of school districts maintained by Market Data Retrieval, a company that specializes in the school market. A random sample of 700 SN directors representing the seven USDA regions was selected for the national survey administration. Sample members were mailed pre-notice letters one week prior to mailing the survey packet. The survey packet consisted

of a survey cover letter, survey instrument, and a stamped, self-addressed, return envelope. Two weeks after the survey packets were mailed, a reminder post card was sent.

Data Analysis

Survey data were analyzed using the statistical package SPSS Version 21.0 for Windows. Descriptive statistics included means, standard deviations, and frequencies of total responses. One-way ANOVA with Tukey's post hoc tests were conducted to determine the relationship between research variables.

RESULTS AND DISCUSSION

Program Characteristics

The response rate for the survey was 29.3% (N=205). The largest percentages of respondents were from the Southeast (23.3%) and Southwest regions (18.0%), while the smallest percentages were from the Northeast (5.8%) and West (9.5%). Most respondents were from districts with student enrollments between 2,000 and 29,000 (65.0%).

The majority of respondents were SN directors (77.6%), while the remainder were district level nutrition supervisors (17.3%) or school level nutrition managers (5.1%). Therefore, from this point forward, respondents will be referred to as SN professionals. Approximately 40% had an associate's degree or less as their highest level of education, while 27.4% had a bachelor's degree. The most common areas of study for those with a bachelor's degree or higher was nutrition and dietetics (21.5%). The majority of respondents indicated they were not certified (36.1%). The most common certification was School Nutrition Association Certified (27.3%), and the least common certification was American Culinary Federation Certified (1.0%). More than one third of respondents indicated that they had worked in SN programs for greater than 20 years (37.6%); however, 34% indicated they had only been in their current position for 1 to 5 years. When asked where they worked prior to taking their current position, less than half indicated they worked in a managerial role for an SN program (43.4%).

Perceptions of Key Performance Indicators

Respondents were asked to indicate their perceptions of KPIs based on the following areas: their understanding of KPIs, their access to data for calculating KPIs, the value of KPIs, the ease of use of KPIs and the adequacy of training that SN professionals receive with regards to KPIs. Those results are provided below.

Understanding of KPIs

When respondents were asked to rate the level of understanding of SN KPIs on a three point scale (3=adequate, 2=partial, and 1=no understanding), the KPIs that received the highest mean ratings were Average Daily Participation (2.95 ± 0.27), Meals Per Labor Hour (2.87 ± 0.38) and Cost Per Meal (2.84 ± 0.41). The KPIs that received the lowest mean ratings were Percent Over-Production (2.25 ± 0.76), Inventory Turnover Rate (2.54 ± 0.63), and Days of Inventory On-Hand (2.58 ± 0.62) (Table 1.) When the frequencies and percentages for respondents' level of understanding of SN KPIs were tallied, three issues became apparent (Table 2). First, the majority of respondents indicated they had an adequate understanding of 11 of the 12 SN KPIs. Second, Percent Over-Production was the only KPI where less than half of respondents (44.6%) indicated they had an adequate understanding. Third, 19.3% of respondents indicated they had no level of understanding of the KPI Percent Over-Production. (Table 2.)

Access to data for calculating KPIs

When respondents were asked if they have the necessary data to

Table 1: Mean Rating for Level of Understanding of KPIs

	Mean ^a	SD ^b
Average Daily Participation	2.95	0.27
Meals Per Labor Hour	2.87	0.38
Cost Per Meal	2.84	0.41
Revenue Per Meal	2.75	0.47
Absentee Rate	2.69	0.54
Staff Turnover Rate	2.67	0.58
Cost as a Percent of Revenue	2.66	0.58
Break Even Point	2.65	0.58
Day of Inventory On-Hand	2.58	0.62
Inventory Turnover Rate	2.54	0.63
Percent Over-Production	2.25	0.76

^aThree-point rating scale: adequate=3, partial=2, and no understanding=1

^bStandard deviations for each mean

calculate each SN KPI, the majority said "Yes" (Table 3). Average Daily Participation, Cost per Meal, and Meals per Labor Hour were the KPIs that received the most responses of "Yes" (98.0%, 94.0%, and 93.6%, respectively). Percent Over-Production, Inventory Turnover Rate, Breakeven Point, and Days Inventory On-Hand were the KPIs that received the most responses of "No" (14.9%, 13.9%, 12.9%, and 12.9%, respectively) and "I do not know" (18.3%, 9.5%, 8.4%, and 7.9%, respectively).

Value/ease of use/adequacy of KPI training

Respondents were asked to rate their level of agreement with several statements associated with the value, ease of use, and training of SN KPIs. The four point rating scale ranged from 4 (*strongly agree*) to 1 (*strongly disagree*). These are provided in Tables 4-6 in descending order based on the combined frequencies/percentages of strongly agree and agree ratings given.

Value of KPIs

As demonstrated by the results in Table 4, the overwhelming majority of respondents agreed or strongly agreed that KPIs are a valuable SN managerial tool: "Key Performance Indicators, when calculated correctly, can provide essential information about the SN program" (95.5%); "Key Performance Indicators are useful for

Table 2: Level of Understanding of KPIs?

	Adequate (n / %)	Partial (n / %)	No Understanding (n / %)
Average Daily Participation	195 / 95.6	7 / 3.4	2 / 1.0
Meals per Labor Hour	178 / 88.1	21 / 10.4	3 / 1.5
Cost Per Meal	173 / 85.2	27 / 13.3	3 / 1.5
Revenue Per Meal	156 / 76.5	45 / 22.1	3 / 1.5
Staff Turnover Rate	149 / 73.0	43 / 21.1	12 / 5.9
Absentee Rate	147 / 72.8	47 / 23.3	8 / 4.0
Cost as a Percent of Revenue	145 / 71.1	48 / 23.5	11 / 5.4
Breakeven Point	142 / 70.3	49 / 24.3	11 / 5.4
Days of Inventory On-Hand	132 / 65.3	56 / 27.7	14 / 6.9
Inventory Turnover Rate	123 / 61.2	63 / 31.3	15 / 7.5
Percent Over-Production	90 / 44.6	73 / 36.1	39 / 19.3

n = Frequency of responses

% = Percentage of responses

Table 3: "Do you have access to the necessary data to calculate KPIs?"

	Yes (n / %)	No (n / %)	I do not know (n / %)
Average Daily Participation	198 / 98.0	3 / 1.5	1 / 0.5
Cost Per Meal	189 / 94.0	9 / 4.5	3 / 1.5
Meals Per Labor Hour	190 / 93.6	7 / 3.4	6 / 3.0
Revenue Per Meal	184 / 89.8	13 / 6.3	8 / 3.9
Staff Turnover Rate	170 / 83.7	21 / 10.3	12 / 5.9
Cost as a Percent of Revenue	168 / 82.4	26 / 12.7	10 / 4.9
Absentee Rate	162 / 81.8	25 / 12.6	11 / 5.6
Days of Inventory On-Hand	160 / 79.2	26 / 12.9	16 / 7.9
Breakeven Point	159 / 78.7	26 / 12.9	17 / 8.4
Inventory Turnover Rate	154 / 76.6	28 / 13.9	19 / 9.5
Percent Over-Production	135 / 66.8	30 / 14.9	37 / 18.3

n = Frequency of responses
% = Percentage of responses

decision making" (94.5%); and "Key performance indicators are valuable tools for evaluating an SN program" (92.0%). However, most agreed or strongly agreed that many SN professionals do not understand the value of KPIs (72.9%).

Ease of use of KPIs

With regard to ease of use, SN professionals' perceptions of KPIs were mostly positive (Table 5). The majority of respondents agreed or strongly agreed that decisions based on incorrectly interpreted KPIs can have negative consequences (88.5%), KPIs are time consuming to calculate (71.7%) KPIs are easy to calculate (67.0%), and data for calculating KPIs is easy to obtain (58.6%). Further, only 32.6% agreed or strongly agreed there is no uniform process for calculating KPIs and only 33.8% agreed or strongly agreed KPIs are difficult to interpret. (Table 5)

Adequacy of KPI training

The SN professionals' perceptions suggest the need for more KPI training (Table 6). When respondents were asked to rate their level of agreement with the statement "School nutrition professionals receive adequate training on KPIs," 81.6% disagreed or strongly disagreed. Additionally, the majority of respondents reported that cooks, school level managers, and district level supervisors, either do not receive training on KPIs, or they did **not** know if individuals in these positions receive KPI training (91.0%, 60.0%, and 53.0%, respectively (Table 7).

Enrollment and Perceptions of KPIs

In the section below, the findings that are presented include the relationship between district enrollment size and respondents' perceptions of KPIs associated with understanding, value and ease of use. No significant findings were observed between any other program/personal characteristics and access to or usage of KPIs; therefore, no further details regarding the relationship between these variables are presented.

Enrollment and understanding of KPIs

One-way ANOVA and Tukey's post hoc comparisons demonstrated a significant relationship between district enrollment and respondents' perceived understanding of four KPIs (Table 8). As school district enrollment size increased from $\leq 1,999$ to 2,000-29,999, respondents' perceived level of understanding of meals per labor hour and breakeven point significantly increased ($p < 0.05$ and $p < 0.05$, respectively). However, for the same KPIs (meals per labor hour and breakeven point) no significant differences were observed between districts with enrollment of $\leq 1,999$ and districts with enrollment of $\geq 30,000$ or between districts with enrollments of 2,000-29,999 and $\geq 30,000$. Additionally, it was observed that respondents' perceived level of understanding of cost as a percentage of revenue and revenue per meal significantly increased as school district size increased from $\leq 1,999$ to 2,000-29,999 ($p < 0.05$ and $p < 0.05$; respectively) and from $\leq 1,999$ to $\geq 30,999$ ($p < 0.05$ and $p < 0.05$; respectively). (Table 8)

Enrollment and ease of use of KPIs

Two trends pertaining to enrollment and perceived ease of use of KPIs were exposed using one-way ANOVA testing (Table 9). First, as district enrollment increased from $\leq 1,999$ to 2,000-29,999 and from $\leq 1,999$ to $\geq 30,000$, respondents' agreement ratings with the following statements significantly increased: KPIs are easy to calculate; data for calculating KPIs is easy to obtain; and decisions based on incorrectly interpreted KPIs can have negative consequences ($p < 0.05$; $p < 0.05$, and $p < 0.05$; for each respectively). Second, as enrollment size increased from $\leq 1,999$ to 2,000-29,999, respondents' level of agreement with the following two statements significantly increased: KPIs are difficult to interpret and KPIs are time consuming to calculate ($p < 0.05$ for each). However, no significant differences were observed between respondents with enrollments of $\leq 1,999$ to $\geq 30,000$ regarding these two statements. (Table 9)

Table 4: Agreement with Statements Pertaining to the Value of KPIs

	Strongly Agree (n/%)	Agree (n/%)	Disagree (n/%)	Strongly Disagree (n/%)	N/A (n/%)
KPIs when calculated correctly can provide essential information about the school nutrition program	88 / 44.2	102 / 51.3	0 / 0.0	0 / 0.0	9 / 4.5
KPIs are useful for decision making	72 / 36.2	116 / 58.3	4 / 2.0	0 / 0.0	7 / 3.5
KPIs are valuable tools for evaluating a school nutrition program	67 / 33.5	117 / 58.5	5 / 2.5	2 / 1.0	9 / 4.5
Many school nutrition professionals do not understand the value of KPIs	44 / 22.1	101 / 50.8	35 / 17.6	4 / 2.0	15 / 7.5

n = Frequency of responses
% = Percentage of responses

Table 5: Agreement with Statements Pertaining to the Ease of Use of KPIs

	Strongly Agree (n/%)	Agree (n/%)	Disagree (n/%)	Strongly Disagree (n/%)	N/A (n/%)
Decisions based on incorrectly interpreted KPIs can have negative consequences	35 / 17.6	141 / 70.9	10 / 5.0	2 / 1.0	11 / 5.5
KPIs are time consuming to calculate	34 / 17.2	108 / 54.5	39 / 19.7	8 / 4.0	9 / 4.5
KPIs are easy to calculate	34 / 17.0	100 / 50.0	50 / 25.0	6 / 3.0	10 / 0.5
Data for calculating KPIs is easy to obtain	14 / 7.1	102 / 51.5	63 / 31.8	10 / 5.1	9 / 4.5
KPIs are difficult to interpret	7 / 3.5	61 / 30.3	101 / 50.2	22 / 10.9	10 / 0.5
There is no uniform process for calculating KPIs	9 / 4.5	56 / 28.1	104 / 52.3	16 / 0.8	14 / 7.0

n = Frequency of responses

% = Percentage of responses

Enrollment and value of KPIs

One-way ANOVA testing suggested a significant relationship ($p < .05$) between enrollment and perceived value of KPIs (Table 10). As district enrollment increased from $\leq 1,999$ to 2,000-29,999 and from $\leq 1,999$ to $\geq 30,000$, respondents' level of agreement with the following statements significantly increased: when calculated correctly, KPIs can provide essential information about a SN program; many SN professionals do not understand the value of KPIs; KPIs are valuable tool for evaluating a SN program; and KPIs are useful for decision making. However, no significant differences were observed between respondents with enrollments from 2,000-29,999 to $\geq 30,000$ regarding these statements. (Table 10)

CONCLUSIONS AND APPLICATIONS

The findings of this study suggest that SN professional' overall access to data for calculating KPIs is good. Most SN professionals believe they have access to the necessary data to calculate SN KPIs, especially average daily participation, cost per meal, and meals per labor hour. Further, most professionals do not have to go outside their own departments to gather KPI data, because this data is usually captured in the district SN office.

This study reveals some consensus among SN professionals' regarding their perceptions of KPIs. With the exception of percent over-production, most SN professionals perceive they have an adequate understanding of each of the SN KPIs. The vast majority of SN professionals perceive that SN KPIs provide essential information about SN programs and that they are valuable managerial tools for activities such as program evaluation and decision making. However, most of the respondents believe KPIs are undervalued by SN professionals, and most are concerned that decisions based on incorrectly interpreted KPIs can have negative consequences for an SN program. The majority SN professionals feel KPIs easy, but time consuming to use; and the vast majority do not believe SN professionals receive adequate, if any, training on KPIs.

The results of this study suggest that there is a significant relationship between district enrollment and SN professionals' perceptions of KPIs related to understanding, value, and ease of use. To simplify this explanation, district enrollment ranges are categorized as follows: small = $\leq 1,999$, medium = 2,000-29,999, and large = $\geq 30,000$. School nutrition professionals from medium districts are more likely than

those from small districts to report an adequate understanding of two KPIs (meal per labor hour and breakeven point); while SN professionals from medium and large districts are more likely than those from small districts to report an adequate understanding of two other KPIs (cost as a percentage of revenue and revenue per meal). It is unclear why district enrollment size only affects SN professionals' understanding of these select KPIs.

SN professionals from medium and large districts are more likely to perceive the process of capturing KPIs data and calculating KPIs as easy compared to those from small districts. Further, SN professionals from medium and large districts are more likely to realize and appreciate the consequences of negatively interpreted KPIs and more likely to place a higher value on KPIs compared to those from small districts. This may indicate that SN professionals from medium and large size school districts have more experience and training related to the utilization of KPIs. However, SN professionals from medium size school districts are more likely to perceive that KPIs are time consuming to calculate and difficult to interpret, compared to those from small districts. The possible reasons for this are not as clear. SN professionals from medium size school districts may utilize and rely on KPIs more than those from small districts, and therefore have a greater understanding of what is involved in accurately calculating and interpreting KPIs. However, no significant findings were revealed when comparisons were made between school district enrollment size and usage of KPIs.

SN professionals from medium and large districts are more likely to perceive that KPIs are a valuable for managing SN operations. As stated earlier, this may indicate that SN professionals from medium and large size school districts have more experience and training related to the utilization of KPIs, and therefore, a greater appreciation for the value of KPIs.

Some of the findings from this study match up with what was found in the review of literature. For example, Buzalaka (2010) suggested that effective utilization of KPIs requires understanding of financial management and good business acumen by SN professionals, and the existence of operational systems for data gathering and analyzing, and benchmarking KPIs at SN programs. While SN professionals understanding of financial management and good business acumen was not measured in the study, results suggest that most SN programs have access to the necessary data for calculating KPIs and

Table 6: Agreement that SN Professionals Receive Adequate KPI Training

	Strongly Agree (n/%)	Agree (n/%)	Disagree (n/%)	Strongly Disagree (n/%)	N/A (n/%)
School nutrition professions receive adequate training on KPIs	6 / 3.0	21 / 10.4	94 / 46.8	70 / 34.8	10 / 5.0

n = Frequency of responses

% = Percentage of responses

Table 7: The level of SN Professional that Have Received Training on KPIs at School Districts

	Yes (n / %)	No (n / %)	I do not know (n / %)
District Level Supervisors	93 / 47.0	77 / 38.9	28 / 14.1
School Level Managers	80 / 40.0	100 / 50.0	20 / 10.0
Cooks	18 / 9.0	168 / 84.0	14 / 7.0

n = Frequency of responses
% = Percentage of responses

Table 8: Enrollment Compared to Respondents' Understanding of KPIs

KPIs	Enrollment	n	Mean ^g	SD
Meals per Labor Hour	≤ 1,999 ^a	54	2.69	0.58
	2,000 – 29,999 ^a	131	2.93	0.25
	≥ 30,000	15	2.93	0.26
Cost as a % of Revenue	≤ 1,999 ^{bc}	55	2.42	0.69
	2,000 – 29,999 ^b	132	2.74	0.50
	≥ 30,000 ^c	15	2.87	0.35
Revenue per Meal	≤ 1,999 ^{de}	55	2.60	0.60
	2,000 – 29,999 ^d	132	2.80	0.41
	≥ 30,000 ^e	15	2.93	0.26
Break Even Point	≤ 1,999 ^f	54	2.43	0.72
	2,000 – 29,999 ^f	131	2.73	0.49
	≥ 30,000	15	2.80	0.41

^a F(2, 197) = 8.74, p = .001 Comparison of enrollment to Respondents' Understanding of KPIs using one-way ANOVA and Tukey's post hoc comparisons
^{bc} F(2, 199) = 7.83, p = .001 Comparison of enrollment to Respondents' Understanding of KPIs using one-way ANOVA and Tukey's post hoc comparisons
^{de} F(2, 199) = 4.81, p = .009 Comparison of enrollment to Respondents' Understanding of KPIs using one-way ANOVA and Tukey's post hoc comparisons
^f F(2, 197) = 6.34, p = .002 Comparison of enrollment to Respondents' Understanding of KPIs using one-way ANOVA and Tukey's post hoc comparisons
^g The rating scale for level of understanding was a 3-point (3=adequate understanding, 2=partial understanding, 1=no understanding).

Table 9: Enrollment Compared to Agreement with Statements regarding Ease of Use of KPIs

Statements	Enrollment	n	Mean ⁱ	SD
KPIs are easy to calculate	≤ 1,999 ^{ab}	54	2.37	1.22
	2,000 – 29,999 ^a	131	2.80	0.82
	≥ 30,000 ^{ab}	15	3.13	0.64
Data for calculating KPIs is easy to obtain	≤ 1,999 ^{cd}	54	2.20	1.09
	2,000 – 29,999 ^c	129	2.60	0.77
	≥ 30,000 ^d	15	2.93	0.59
Decisions based on KPIs can have negative consequences	≤ 1,999 ^{ef}	53	2.51	1.31
	2,000 – 29,999 ^e	131	3.09	0.60
	≥ 30,000 ^f	15	3.13	0.35
KPIs are difficult to interpret	≤ 1,999 ^g	54	1.91	1.09
	2,000 – 29,999 ^g	132	2.27	0.70
	≥ 30,000	15	2.13	0.10
KPIs are time consuming to calculate	≤ 1,999 ^h	53	2.47	1.20
	2,000 – 29,999 ^h	130	2.89	0.75
	≥ 30,000	15	2.60	0.83

^{ab} F(2, 197) = 5.76, p = .004 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
^{cd} F(2, 195) = 5.96, p = .003 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
^{ef} F(2, 195) = 9.52, p = .001 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
^g F(2, 198) = 3.61, p = .029 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
^h F(2, 195) = 4.12, p = .018 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
ⁱ The agreement scale contained four points 4=strongly agree, 2=agree, 3=disagree, and 4=strongly disagree).

Table 10: Enrollment Compared to Agreement with Statements regarding Value of KPIs

Statements	Enrollment	n	Mean ⁱ	SD
KPIs when calculated correctly, can provide essential information about a SN program	≤ 1,999 ^{ab}	53	2.79	1.26
	2,000 – 29,999 ^a	131	3.47	0.58
	≥ 30,000 ^b	5	3.67	0.49
Many SN Professionals do not understand the value of KPIs	≤ 1,999 ^{cd}	53	2.40	1.31
	2,000 – 29,999 ^c	132	2.90	0.92
	≥ 30,000 ^d	14	3.07	0.83
KPIs are valuable tools for evaluating a SN program	≤ 1,999 ^{ef}	54	2.67	1.26
	2,000 – 29,999 ^e	131	3.31	0.62
	≥ 30,000 ^f	15	3.60	0.51
KPIs are useful for decision making	≤ 1,999 ^{gh}	53	2.81	1.13
	2,000 – 29,999 ^g	131	3.35	0.58
	≥ 30,000 ^h	15	3.73	0.46

^{ab} F(2, 196) = 14.69, p = .001 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
^{cd} F(2, 196) = 5.12, p = .007 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
^{ef} F(2, 197) = 13.49, p = .001 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
^{gh} F(2, 196) = 13.03, p = .001 Comparison of enrollment to respondents' Agreement regarding statements about KPIs using one-way ANOVA and Tukey's post hoc comparisons
ⁱ The agreement scale contained four points 1=strongly agree, 2=agree, 3=disagree, and 4=strongly disagree).

data for calculating KPIs is easy to obtain, which meets at least one of the criteria for effective utilization of KPIs. Further, Boettger (2009), Buzalaka (2010), and Fahey (2011) all suggest that KPIs are important tools that can be used by SN professional for making operational decision and evaluating programs. These sentiments were corroborated by the majority of SN professional who indicated “KPIs when calculated correctly can provide essential information about the SN program,” “KPIs are useful for decision making,” and “KPIs are valuable tools for evaluating a SN program.”

Results of this study suggest the need for the development of training and resources to support SN directors, managers, and supervisors regardless of district size in effectively utilizing KPIs.

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