Evaluation of the pilot menu labeling initiative in Kaiser Permanente Cafeterias 2008

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FINAL REPORT

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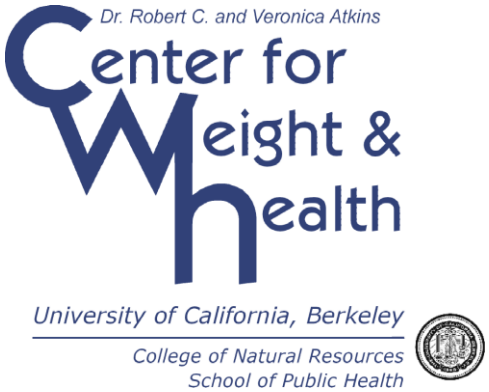

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Executive Summary

Introduction
From August to November, 2008, several Kaiser Permanente hospital cafeterias participated in a pilot intervention, labeling the calorie and nutrient content of items in their cafeterias to help patrons be able to make informed decisions about their purchases. The UC Berkeley Center for Weight and Health evaluated the program using survey and purchase data to determine the impact of the menu labeling program on patrons' attitudes and purchasing behaviors.

Methods
Five Kaiser Permanente cafeteria sites participated in one of the three intervention groups: 1) calorie labeling at point of purchase plus a centrally located poster with nutrient analysis of menu items; 2) poster with nutrient analysis only; or 3) no intervention (comparison sites). The interventions were an addition to the on-going *Healthy Picks* logo on healthy menu choices operating in all KP cafeterias.

Data collection included exit surveys of patrons in the intervention cafeterias to assess their attitudes, awareness, and usage of posted calorie information. In addition, data regarding patron purchases were collected before the intervention began and again during the intervention period to assess the extent to which the provision of calorie information affected purchasing behavior. Purchases were assessed using electronic cash register data at the two sites in which this was possible, and by observation at all 5 participating sites.

Results
More than 500 patrons completed cafeteria exit surveys. Most respondents noticed the calorie information, with significantly more noticing this information at the menu board plus poster sites compared to the poster only site (69% vs. 58%, respectively). Nearly a third of those who noticed the information reported that they altered their purchase as a result of the information. Nearly all respondents at both types of intervention sites agreed that calorie information should be available in cafeterias and more than 80% felt that Kaiser was helping them to look after their health by providing the calorie and nutrient information.

Purchase data showed a significant improvement in purchases of healthier side dishes ($p<0.0001$) and snacks ($p=0.006$) at a hospital cafeteria with labeled menu boards and poster compared with a control hospital cafeteria with no labeling. Little change was observed in entrée selections at either cafeteria.

Conclusions and Recommendations
This pilot provides evidence from patron surveys, purchase records and on-site observational data, demonstrating the benefits of providing calorie information to patrons of Kaiser Permanente cafeterias. In addition, the findings suggest that some refinements to program implementation strategies may enhance program delivery. For example, a well designed education and promotion program would likely enhance the awareness and usefulness of the information to cafeteria patrons.

INTRODUCTION

Nearly two thirds of United States adults are overweight, including 30% who are obese (1). Overweight and obesity are associated with increased morbidity and mortality, and medical expenses attributable to these conditions represent close to 9% of total U.S. medical expenditures (2). Americans are consuming significantly more calories today than they did three decades ago (3). Between 1985 and 2000, per capita energy consumption increased by about 300 calories per day (4).

In 1970, Americans spent 26% of their total food budget on away-from-home foods (5). In 2002, approximately 46% of the total food budget was spent on away-from-home foods (6). Eating away from home is likely an important contributor to the rise in calorie consumption since consumers are unable to detect the energy density of restaurant meals. Placing calorie information on menus and menu boards has been proposed to make this information easily accessible and to encourage food establishments to reduce the calories in some of their menu items. In California, New York, and Washington, legislation has been enacted requiring menu boards in fast food chains to be labeled with calorie information. Many restaurants provide nutrition information on websites or posters but these are not readily accessible at the point of purchase. Menu labeling is intended to provide consumers with calorie information at the point of decision or purchase, thus providing an opportunity for customers to make informed lower-calorie choices, should they wish to do so. Food labeling is one of a number of strategies for reducing the incidence of obesity and protecting health.

Several studies have reported mixed results regarding the impact of providing point-of-decision calorie and/or other nutrition information in cafeteria settings (7-16). However, none of these studies employed a rigorous design using comparison or control cafeterias, and each study differed by setting (e.g. hospital, worksite, military, college, commercial cafeteria), the types of interventions (i.e., calorie label on menu boards, low-fat item logo, nutrition game, information for multiple nutrients, nutrient information on posters) and the outcomes measured (e.g. calories purchased, proportion of lower-calorie items purchased within a menu category, total servings of an item purchased daily, percent of individuals selecting at least one healthy food, percent of customers who changed their meal selection). Thus, at present there is insufficient evidence as to the impact of point of decision calorie information on consumer purchase behavior. Research is needed that is rigorous in its methodology, consistent with recommendations emerging from the current policy debate, and feasible in restaurant and cafeteria settings.

Kaiser Permanente (KP) has instituted the *Healthy Picks* program (a *Healthy Picks* logo is placed next to qualifying food and beverage items that meet nutrition criteria) in an effort to improve access to healthy foods in its facilities. This program has improved the availability of healthier food items in vending machines and cafeterias utilized by employees, health plan members, and visitors, and serves as a model for industry and the nation. In a second initiative, the results of which are described in this report, KP sought to implement and evaluate a pilot calorie labeling program in selected cafeterias. This report presents the findings of this pilot project, including results from a survey of cafeteria patrons about their awareness, satisfaction, attitudes, and

behaviors related to posted calorie information, as well as findings from electronic records of patron purchases and observations made prior to and during the calorie labeling intervention, to determine the impact of the pilot program. In addition, a summary of the key resources used to implement menu labeling are summarized from the formative assessment of the project (see full report of the formative assessment in Appendix 3).

METHODS

Study Design

Six Kaiser Permanente hospital cafeterias were selected by KP to participate in the 12-week study to examine the impact of point-of-decision calorie information on hospital cafeteria patron purchases at lunchtime. Patron purchase data were collected prior to the implementation of calorie labeling and again during the calorie labeling intervention. Patron satisfaction and opinion surveys were collected during the calorie labeling intervention.

Two models of providing calorie information were tested: the provision of this information at point-of-decision as well as on a centrally located poster and the provision of this information on a centrally located poster only. Thus, participating cafeterias were divided into three intervention categories:

1. Calorie information on countertop menu boards posted at the point of decision and Additional nutrition information, including calories, on a poster in a central location in the cafeteria, away from the point of decision.
2. Nutritional information (including calories) on a poster in a central location in the cafeteria, away from the point of decision.
3. No intervention (comparison site)—no calorie or other nutritional information

Table 1. Intervention categories and participating sites

Intervention Category	Sites
Calorie information on menu boards at point-of-decision and centrally located poster	Sacramento, Baldwin Park
Calorie information available on centrally located poster only	San Jose, Fontana
No intervention (comparison sites)	Vallejo, Anaheim

The Fontana site withdrew from the study during baseline data collection, leaving only 1 site testing the poster-only intervention.

Timeline and Data Collection

At the start of the study, hospital employees were informed about the project by email and flyers, primarily to alert them that study staff would be on site during the project period. Each cafeteria selected a 4-week lunchtime menu to repeat three times over the 12-week study period, from September to mid-November, 2008. Data collection and program implementation during the study period occurred as described in Table 2.

Table 2. Timeline

Time Period	Activity
Weeks 1-4	Baseline purchase data collection (observational and electronic cash register data)
Week 5	Calorie labeling menu boards and posters are placed in the intervention sites
Weeks 9-12	Follow up purchase data collection (observation and cash register data) and patron surveys collected

Measures

Patron surveys: One day per week during the last four weeks of the study, patrons at the three intervention sites were asked to complete a short survey about the cafeteria as they exited. To ensure anonymity, patrons were directed to return completed surveys in a box located in a separate area of the cafeteria. No incentives were provided. The survey included 16 questions pertaining to patron attitudes, awareness, and usage of posted calorie information and demographic information (**Appendix 1**). Surveys were distributed on Tuesdays, Wednesdays, or Thursdays, with the day of the week rotating each week.

Electronic cash register data: Patron purchases during lunchtime (11:30 am to 1:30 pm Monday through Friday) were obtained from electronic cash registers in the two cafeteria sites that had this capacity (Baldwin Park and Anaheim). Purchases were recorded during the first and last four weeks of the 12-week study for a total of 19 days each during the baseline and intervention periods.

Observation data: Because electronic cash register data were not available from all sites, observations of patron purchases at lunchtime (11:30am-1:30 pm) were conducted at all sites. Observations were captured and recorded by trained study staff. On observation days, study staff stood behind cafeteria cashiers and recorded the items each patron purchased, including hot entrees, daily specials, soups, sandwiches, side dishes, desserts/snacks, and beverages. Observation data were collected during the first four weeks of the study (baseline) and were repeated during the final four weeks of the study (endpoint). Observations were conducted one day per week at each site, either Tuesday, Wednesday, or Thursday, with the observation day rotating weekly and coinciding with patron survey data collection.

Calorie Calculations

To determine the calorie and nutrient content of KP cafeteria foods, Registered Dietitians, under the supervision of a KP dietitian, used computer software (Food Processor, ESHA) to calculate calories and nutrients per serving for each item on hospital cycle menus selected for the study period. The KP dietitian obtained quantified recipes from each hospital food service director, and where hospital food services work in contract with catering companies, recipes were provided by company directors. Calorie calculations were checked and anomalies corrected by the KP supervising dietitian and by research staff at the Dr. Robert C. and Veronica Atkins Center for Weight and Health (CWH) at the University of California, Berkeley.

Calories for pre-packaged foods and beverages were obtained from packaging labels by the cafeteria and study staff.

Menu Boards and Posters

Menu boards were 8½ x 11 inch signs placed at countertop level at each food station in the cafeteria (i.e., grill, entrée/side dish station, soup station, salad bar, sandwich bar, and grab-and-go station). The information presented on signs included the item name, calorie content, and price (**Appendix 2**). For beverages, a sign was placed on the door of one of the beverage cold cases in a highly-visible location. Due to the large number of beverages offered, an average calorie value by type of beverage (e.g., diet sodas, regular sodas, sports drinks, fruit juices and smoothies, and energy drinks) and size was posted, and prices were not included.

Posters were created in a manner similar to that found in fast food chain restaurants. Posters listed all menu items and their respective nutrient content (calories, fat, sodium, etc.).

Data Analyses

Patron survey data

Differences in demographic and other characteristics of the intervention groups were evaluated using chi square techniques for categorical variables (trying to lose weight, gender, Kaiser employee status, and Hispanic status), and the Wilcoxin rank sum test for two independent samples for ordinal variables (frequency eating at the cafeteria during lunchtime, age, and education level attained) to test for differences between the two groups. The two-sample Wilcoxin test was used to determine if there were statistically significant differences in awareness and attitudes about posted calorie information between the two intervention groups.

Food purchase data

Classification and Coding of Foods Purchased

Cafeteria purchases were placed into one of four menu categories: entrees, side dishes, snacks, or beverages. Within each of these menu categories, items were coded as either "target" or "non-target" based on the calorie content of the item, as detailed below:

- Entrees (ex: grill sandwiches, daily specials, and hot entrees) were coded as "target" if they contained ≤ 400 calories per item purchased. Examples of target entrees included baked fish, eggplant parmesan, beef burrito, beef fajita, grilled chicken sandwich, and various deli-style sandwiches. In addition, most salads and soups were target entrees. Make your own salads and sandwiches could not be classified as target or not target because of the variation in ingredients selected by patrons. Non-target entrees contained > 400 calories per serving purchased and included items such as chicken paprika, beef tacos, pasta with meat sauce, chicken a la king, meat loaf, beef stew, grilled Rueben sandwich, hamburger, cheeseburger, patty melt, cheese and beef enchiladas, and chili cheese dog.

- Side dishes were coded as "target" if they contained ≤ 250 calories per item purchased. Target side dishes included vegetables, rice dishes, and mashed potatoes. Non-target side dishes contained > 250 calories per item and included items such as French fries, chili cheese fries, and corn bread.

- Snacks were coded as "target" if they contained ≤ 150 calories per item purchased. Target snacks included items such as fresh fruit, carrots, nonfat and low-fat yogurt or cottage cheese, small boxes of ready-to-eat cereal, and hardboiled eggs. Non-target snacks contained > 150 calories per item and included pastries, donuts, muffins, cookies, candy, chips, and ice cream.

- Beverages were coded as "target" if they contained ≤ 150 calories per item purchased and included water, 10 fl oz fruit juices, flavored waters, sports drinks, coffee, and tea. Non-target beverages contained > 150 calories per item and included juices larger than 10 fl oz, sodas, and sweetened energy drinks. Note: While some beverages coded as "target" may not be considered optimal for health, they represent lower-calorie choices compared to non-target choices.

Electronic cash register data

Patron purchase data obtained from electronic cash registers (at Baldwin Park and Anaheim sites) were analyzed comparing 19 matched pairs of baseline and follow-up days to ensure that menus were the same on comparison days. For each matching baseline and follow-up day, the proportions of purchased items that were coded as target were calculated for the categories of entrees, side dishes, snacks, and beverages. For each paired day within a cafeteria site, the changes between baseline and follow-up (i.e., follow-up minus baseline) in the proportion of purchased items that were target were then calculated. This generated 19 change values for each category within each site. A test of the statistical significance of the differences in changes between the comparison and menu board/poster sites was conducted by analysis of covariance with the proportion of items at baseline that were purchased as target as the covariate in the model.

Observation of purchases

Patron purchase data obtained by observation were analyzed comparing four matched pairs of baseline and follow-up days to ensure that menus were the same on comparison days. Analyses of observational data were similar to those for cash register data, though many fewer data points were collected using the observational method. As was done with the electronic register data, for each matching baseline and follow-up day, the proportions of purchased items that were coded as target were calculated for the categories of entrees, side dishes, snacks, and beverages. For each paired day within a cafeteria site, the changes between baseline and follow-up (i.e., follow-up minus baseline) in the proportion of purchased items that were target were then calculated. This generated 4 change values for each category within each site. A test of the statistical significance of the differences in changes between the non-intervention sites (comparison) and the 2 different types of intervention sites was conducted by analysis of covariance with the proportion of items at baseline that were purchased as target as the covariate in the model. Patrons who purchased salads or self-prepared sandwiches were excluded from this analysis because they could not be classified as target or not target; calories for these items were variable and could not be determined.

RESULTS

Patron Response to Calorie Labeling: Survey Findings

A total of 554 respondents from the three intervention sites completed the survey, 334 from sites with both menu boards and a poster, and 220 respondents from the poster only site. The characteristics of survey respondents are summarized in Table 3. Nearly half of those who completed the survey reported that they ate in the cafeteria at least several days a week. Over half of all respondents reported that they were trying to lose weight. Approximately two thirds were female, with nearly half reporting they were age 30-49 years. The difference in the distribution of age was statistically different between intervention sites, with respondents from the poster only site being older ($p<0.01$). Approximately 71% of respondents were KP employees, 23% were members, and 6% were neither. Non-physician health care providers comprised 55% of the employee respondents at the menu board plus poster sites, and 44% at the poster only site. The difference in the distribution of KP employee status was statistically significant between intervention sites ($p<0.05$). The majority of respondents in both groups identified themselves as white, with most of the remainder identifying as Asian or Black. Additionally, approximately 30% of respondents identified themselves as Hispanic, with no significant difference between intervention sites. More than 80% of respondents had completed at least some college, with close to half being college graduates.

Table 3. Characteristics of survey respondents by intervention.

Characteristic	Menu Boards plus Poster (2 sites)	Poster only (1 site)	P value
Sample size, n	334	220	
Frequency of eating at cafeteria during lunchtime, %			NS
Every day	19.4	19.8	
Several days/wk	27.9	25.8	
At least once/wk	15.2	21.7	
Occasionally	20.6	21.2	
Almost never	17.0	11.5	
Trying to lose weight, %	58.7	53.8	NS
Female, %	63.8%	67.0	NS
Age, years			P<0.01
18-29	15.8	5.2	
30-49	46.1	51.0	
50 and above	38.1	43.8	
Kaiser status, %			NS
Employee	71.8	70.8	
Member only	23.1	22.0	
Neither	5.1	7.2	
Kaiser employee category, %			p<0.05
Physician	4.5	10.6	
Non-physician†	55.0	43.9	
Other	40.6	45.5	
Education			NS
≤ 8th grade	0.3	1.0	
Some high school	2.4	1.0	
High school graduate	10.2	10.1	
Some college	42.7	40.1	
College graduate	44.4	47.8	

† Refers to non-physician healthcare professional.

Respondents from the sites with both menu boards and posters were more likely to notice calorie information compared to respondents at the site with posters alone (**Table 4**). Approximately 69% of respondents at the menu board plus poster sites noticed the posted calorie information in cafeterias, while 58% of respondents at the poster only site noticed the information, and the difference was statistically significant ($p<0.05$).

Table 4. Have you noticed any information about the calorie content of menu items posted in this cafeteria?

Response	Menu Boards plus Poster (n=331) %	Poster only (n=217) %	P value
No	21	31	p<0.05
Yes	69	58	
Not sure	10	11	

Among those who noticed the posted calorie information at each site, approximately 32% of respondents at the menu boards plus poster sites stated that their purchase that day was influenced by the posted calorie information, while 29% of those from the poster only site indicated some influence of the information (**Table 5**).

Table 5. Among those who noticed posted calorie information: Did calorie information influence what you purchased in the cafeteria today?

Response	Menu Boards plus Poster (n=222) %	Poster only (n=123) %	P value
No	68	71	NS
Yes	32	29	

Approximately 76% of respondents at the menu boards plus poster sites and 70% of those from the poster only site agreed that the posted calorie information was useful for making decisions about what to buy (**Table 6)**.

Table 6. Having calorie information available in this cafeteria is useful in making decisions about what to buy.

Response	Menu Boards plus Poster (n=330) %	Poster only (n=217) %	P value p<0.10
Strongly agree	39	35	
Agree	37	35	
Neither agree nor disagree	17	23	
Disagree	4	5	
Strongly disagree	2	2	

*Chi-square test was used to test the statistical significance of the difference in proportions for the combined category of "agree" and "strongly agree."

Nearly all respondents (88% of at the menu boards plus poster sites and 82% at the poster only site) agreed that cafeterias should provide calorie information **(Table 7)**.

Table 7. Eating establishments like cafeterias should provide calorie information about their foods and beverages.

Response	Menu Boards plus Poster (n=330) %	Poster only (n=215) %	P value p<0.10
Strongly agree	49	46	
Agree	39	36	
Neither agree nor disagree	10	13	
Disagree	1	4	
Strongly disagree	1	1	

*Chi-square test was used to test the statistical significance of the difference in proportions for the combined category of "agree" and "strongly agree."

Most respondents (86% at the menu board plus poster sites and 83% at the poster only site) also agreed that by providing calorie information, KP is helping to look after their health (**Table 8**).

Table 8. By providing calorie information, I feel that Kaiser Permanente is helping me to look after my health.

Response	Menu Boards and Poster (n=330) %	Poster only (n=216) %	P value NS
Strongly agree	51	45	
Agree	35	38	
Neither agree nor disagree	11	13	
Disagree	1	2	
Strongly disagree	2	1	

*Chi-square test was used to test the statistical significance of the difference in proportions for the combined category of "agree" and "strongly agree."

A few respondents (10% at the menu boards plus poster sites and 12% from the poster only site) thought there were potential disadvantages to having calorie information posted in the cafeterias (**Table 9**). The following disadvantages were cited by respondents from the menu boards and poster sites: guilt from ordering high-calorie foods (n=8), signage is a nuisance (n=4), information generates confusion (n=4), information raises awareness of the lack of lower-calorie selections available (n=2), efforts will increase food costs (n=2), and calorie information may adversely affect teenagers (n=1). The disadvantages cited by respondents from the poster only site included: guilt from ordering high-calorie foods (n=5), information generates confusion (n=5), efforts will increase food costs (n=2), process creates more work for employees (n=1), and posting may change the type of food that is available (n=1).

Table 9. Are there disadvantages to having calorie information available in the cafeteria?

Response	Menu Boards and Poster (n=330) %	Poster only (n=215) %	P value
No	90	88	NS
Yes	10	12	

Impact of Intervention on Patron Purchases from Electronic Cash Register Records

At the two sites with electronic cash registers, average daily lunchtime purchases remained fairly constant over the month long baseline and intervention period. At baseline, an average of 409 lunchtime purchases were made per day at the intervention site (Baldwin Park, a menu board plus poster site), and 394 per day during the corresponding intervention period. At Anaheim (a no intervention/comparison site) an average of 205 lunchtime purchases were made per day during baseline, and 200 per day during the intervention period. Electronic cash register data provided a comparison of 19 matched days from the baseline and intervention periods. **Table 10** presents the percentage of target items purchased at baseline at the two sites, as well as the changes that occurred between baseline and follow-up. The proportion of target side dishes increased by 4.8% at the intervention site and decreased by 4.8% at the non-intervention site. The difference between sites was statistically significant (p=0.0007). The change in the proportion of target snacks purchased also differed significantly between the two sites. The purchase of target snacks decreased 8.1% at the comparison site and increased 1.3% at the menu board plus poster site (p<0.006). Very little change was observed in the proportion of "target" entrée items purchased for either site, and the differences between sites were not statistically significant. Changes in purchases of target beverages could not be determined because the large number of self-serve fountain beverages could not be distinguished by check out clerks or observers as sugar sweetened or diet beverages.

Table 10. Summary of patron purchases within menu categories at lunchtime in two cafeteria sites with electronic cash register records.

	Baseline % of "target" items purchased (mean ± SD)	Change in % of "target" items purchased from baseline to follow-up (adjusted mean)*	P value for the adjusted differences between sites**
Entrees* **			
Comparison site	79.2 ± 4.3%	0.05%	NS
Menu board + poster site	68.6 ± 6.6%	0.03%	
Side Dishes			
Comparison site	69.2 ± 9.9%	-4.8%	0.0007
Menu board+ poster site	78.4 ± 6.6%	4.8%	
Snacks			
Comparison site	27.8 ± 6.0%	-8.1%	0.006
Menu board+ poster site	40.3 ± 9.3%	1.3%	

* Adjusted for percent of target item(s) purchased at baseline.

** P value pertains to the statistical significance of the adjusted differences in the changes in percent of target items purchased from baseline to follow-up between the menu board and comparison sites.

*** Target entrée ≤ 400 calories.

Impact of Intervention on Patron Purchases from Onsite Observations

Observations of patron purchases were conducted during the baseline and follow-up periods at all 5 sites, with an average of 298 patron observations per site per lunch (range: 199 - 422 patrons). The average number of daily patrons did not differ between baseline and follow-up by more than 20 patrons for any single cafeteria. Patron purchases were observed for four days prior to the intervention and on four matched days during the intervention period. In contrast to the findings from the electronic cash register data, no significant differences were observed in the percent of target items purchased in any menu category between the baseline and follow up periods. While the power was not sufficient to detect changes in the proportion of target items selected, observations regarding the nature of purchases are noteworthy:

1. At all hospitals, the most commonly purchased entrees were make your own salads and sandwiches, accounting for approximately 30% of purchases. Due to wide potential variability of ingredients, and portions, changes in this category of entrée could not be assessed.
2. There were instances where the average purchases of very high calorie items decreased and low calorie items increased at intervention sites. For example, at one hospital, a low calorie "buffalo chicken sandwich", which had 260 calories, was selected by 26 patrons at baseline, and increased to 84 patrons at follow up. At another hospital, chili cheese fries at 490 calories were purchased by 15 people at baseline but decreased to 8 at follow up. While not statistically significant, changes in sales of selected low and high calorie foods can be useful for future intervention planning.
3. The most commonly available and purchased side dish at all sites was French fries, accounting for 35% -90% of side dish purchases. It appears that patrons at cafeterias with more side dish choices purchased French fries less often than at cafeterias with fewer side dish choices.
4. While fruit and vegetable offerings were grouped with pre-packaged target snack foods at most sites, at one intervention site, fruits were individually identified. This site showed an increase in fruit purchases over the study period.

DISCUSSION

While the interventions tested in KP cafeterias were similar to those mandated in fast food chain restaurants in Washington and New York and being introduced in California, this study is unique in its contributions to our understanding of the effects of menu labeling on cafeteria patrons. Unlike earlier studies, this study provides outcomes related to labeling of all menu items rather than labeling only selected healthy items; a comparison between visibility of poster and menu board labeling; multiple methods of measuring change in patron purchases, including electronic cash register data for all food sales as well as observation data; and patron opinions about labeling measured after the program was implemented rather than "hypothetically" prior to labeling.

While opinion polls among consumers nationwide and in individual states indicate strong support for menu labeling (17), this is the first study to show that patrons appreciate labeling once it has been made available. A nationwide survey of 1,002 respondents commissioned by Harvard Forums on Health found that 62% of those surveyed favored requiring restaurants to list nutrition information, like calories, on menus. Just last year, a nationwide poll of 1,003 adults found that 78% agreed that fast-food and other chain restaurants should list nutrition information on menus and menu boards.

Respondents were more likely to notice calorie information from the combination of menu boards and posters compared to posters alone (69% versus 58%; $p<0.05$). The significant difference in awareness of the posted calorie information is not unexpected since menu boards were visible at the point of decision whereas posters were mounted at central locations in the cafeterias, away from the point where food purchase decisions were made. Interestingly, 31% of respondents reported not noticing the new menu boards. It may be necessary to promote actively the program and the lower calorie options available. In addition, the level of awareness of the poster alone was higher than expected. It could be that this information is more readily sought after in medical settings, since patrons may be thinking more about their health. Additionally, this may be related to the fairly highly educated sample of respondents. Communications to employees about the nature of the study, as well as the ongoing presence of the study staff in the cafeteria on observation days could have contributed to the higher-than-expected awareness level.

Among those who noticed the posted calorie information, nearly a third at the intervention sites (32% at menu boards plus poster sites and 29% at the poster only site) indicated that their purchase that day was influenced by the posted calorie information. In addition, about three quarters of all respondents agreed that the posted calorie information was useful for making decisions about what to buy. Thus, providing the nutrition information in the ways tested is appreciated by patrons and utilized by a sizable proportion of them, particularly in regards to their side dish and snack food choices. It is very encouraging that a majority of respondents report that having calorie information available in the cafeteria is useful in making decisions about what to buy.

Eighty percent of all respondents, regardless of intervention type (menu board plus poster or poster alone) agreed that cafeterias should provide calorie information. These findings are

notable in that they are the first to demonstrate this opinion in a survey administered *after* patrons were exposed to calorie signage for a minimum of four weeks, thus confirming patron interest after a prolonged period of exposure. These findings suggest that the addition of calorie information to menu boards neither clutters the boards nor confuses the patrons.

While approximately 11% of respondents indicated that there are potential disadvantages to having calorie information posted in the cafeterias, the most common disadvantage cited was guilt from ordering high-calorie foods. The vast majority agreed that by providing calorie information, their employer is helping to look after their health. Since over 70% of respondents were Kaiser employees, the provision of calorie information in worksite cafeterias is strongly viewed by employees as a positive worksite development.

Impact of Labeling on Purchases

A recent synthesis of research on menu labeling has reported modest changes in some studies of patron purchases but a mixed picture of results partly attributed to methodological differences between studies (19). Few studies have employed control or comparison designs. Further, each study has differed by setting, the types of labeling interventions, and the outcomes measured. Only three studies utilized electronic cash registers to track patron purchases (10,15,16). However, one of these studies only provided calorie information for select lower-calorie foods (10), a second identified select lower-calorie entrees with a logo but did not label the calorie content of the entrees (15), and the third was a nutrition education game where patrons passing the cafeteria cashiers were encouraged to take cards with nutrition messages that they could collect and trade in for colorful posters (16).

In our study, data collected by electronic cash registers showed significant differences between the intervention site (with menu board plus poster) and the comparison site with no intervention. Menu labeling had a positive impact on selection of lower-calorie side dishes and snacks. Considering that the menu labeling exposure was relatively short-term, and that promotion of the program was minimal, the effect size of 9.6% for the difference between sites in the change in choice of side dishes, and 9.4% for the difference in choice of snack foods is impressive. Indeed, not all patrons can be expected to notice menu labeling, and of those who do, not all will seek lower-calorie options. This finding is consistent with an earlier study of a cafeteria centered between a medical center and business district, where the provision of calorie information for select lower-calorie foods was associated with an increase in the purchase of side dishes such as vegetables and salads, but did not impact the purchase of entrees (10). While caution must be exercised in generalizing our findings, it is possible that cafeteria patrons utilize calorie information differentially among foods from various groups.

The approximately 10% increase we observed in purchase of target lower calorie side dishes and snacks (which included a reduction in percent sales of French fries, corn bread, chocolate chip cookies and concomitant increases in rice, non-fried potatoes and light yogurt) at the sites with labeled menu boards could have a measurable impact on calories saved and excess weight gain prevented. A shift among regular cafeteria patrons who selected lower calorie side dishes including rice or mashed potatoes (approximately 130 calories) in place of corn bread (270 calories) or French fries (approximately 300 calories) twice a week, could potentially prevent 4-5 pounds of weight gain in one year, assuming no compensation occurs (e.g., eating more calories

at other times of the day)[1]. Similarly, those who chose light yogurt (120 calories) as a snack instead of a large chocolate chip cookie (390 calories) twice a week could prevent approximately 8 pounds of weight gain in one year, again, assuming that no compensation occurs.

The impact of the menu labeling intervention may have been greater among some sub-groups in our sample, as suggested by previous research (19). In particular, changes may have been greater among those who: noticed the calorie information (67%); those who were trying to lose weight (59%); women (64%); and those who said they had used the calorie information in deciding what to purchase (32%). Because of the institutional requirement that surveys be anonymous, we were unable to link the patron survey with the patron purchase information, so the differential impact of calorie labeling on particular patron sub-groups could not be assessed.

The electronic cash register record was a superior method of documenting patron purchases for this study, by providing routinely collected data for nearly a full month (19 weekdays) during baseline and follow-up on all lunchtime purchases. However, the capability to supply these data was only available at one intervention and one control site. By contrast, the onsite observation method was limited to four days of lunchtime purchases at baseline and follow-up. Thus, from the observational data, we lacked sufficient power to detect relatively modest but significant differences in patron purchases in each menu category.

Although we attempted to document changes in purchases of target beverages, neither the electronic cash register records nor the observation data allowed us to distinguish between sugar sweetened (calorie containing) and diet (non caloric) beverages from the self-serve fountain. Because there is considerable interest in reducing consumption of high calorie beverages to prevent obesity, methods for distinguishing between types of beverages purchased could usefully be devised for future monitoring and evaluation of menu labeling, for example, distinct cup or lid appearance, and different codes for these drinks on the cash register.

Beyond the impact of menu labeling on individuals' purchase behavior, another benefit is the potential *virtuous cycle* it may initiate (18). The "virtuous cycle" suggests that the process of labeling foods with their calories may stimulate cafeterias and restaurants to reformulate their menus and reduce portion sizes to incorporate more low-calorie offerings. Further changes in one geographic location may spur changes in adjacent regions or other types of eating establishments in order to be competitive. Thus Kaiser Permanente may take a lead in becoming an initiator of a "virtuous cycle."

[1] Assuming 3500 calories per pound.

Key resources for implementation of menu labeling

Effort for the pilot project focused on two main tasks 1) calculation of the calories and nutrients in items offered for sale in the KP cafeterias participating in the pilot and 2) development and posting of signage of menu boards and posters in the intervention sites. Two contract dietitians spent 326 hours verifying recipes and conducting the calorie/nutrient analysis of approximately 1000 recipes from the 6 selected hospitals. The supervising RD spent 90 hours verifying and assisting the contract RDs. The cost of three nutrition software licenses was $450.00. The calorie analysis task took approximately 6 weeks, although double this length of time per 1000 recipes was seen as preferable to verify incomplete recipes with food service managers and to review and modify daily menus to ensure that lower calorie target items were aligned with the *Healthy Picks* logo, and available at competitive prices in each menu category each day.

Time spent in development of a design and template for menu boards and posters was not calculated, as this was an initial investment that will be available for use across the KP system. Calorie and nutrient values were electronically imported into the poster and menu board software so did not impose a cost for re-entering these values. Five posters were printed and shipped to intervention hospitals at a cost of approximately $450.00.

Other tasks involved in the implementation of the program included development of communications with food service managers and KP employees about the menu labeling pilot, which were developed in house by KP employees with assistance from CWH, thus requiring limited resources. For more detail on the development and implementation of the pilot project, see the report of the Formative Assessment in Appendix 3.

The above summarizes the main resource requirements for dissemination of the menu labeling intervention in KP cafeterias, based on the pilot project. Experience suggests that the program could be refined, and its effectiveness may be enhanced with some additional resources for the promotion of the initiative, additional time to review daily menus to ensure that patrons have clear lower calorie nutritious choices each day, and additional time for quality control such as verification of the recipes and portion sizes to ensure they are consistent with the posted calorie values.

RECOMMENDATIONS

As a result of the menu labeling pilot project, it is recommended that:

1. Menu board labeling be disseminated to other KP cafeteria sites. Calorie labeling should be integrated with the *Healthy Picks* program to ensure that calorie information is appropriately displayed and interpreted as one consideration, among several, in selecting a nutritious diet.

2. Menu board labeling be promoted among employees and KP members. The promotion could include advice on the relationship between food choices and health and examples of how food selections can influence calorie intake.

3. The menu board labeling program be refined, considering the following suggestions:
    - Review cycle menus to ensure at least one lower calorie, appealing and competitively priced entrée, side dish and snack are offered each day at cafeterias.
    - For entrees high in calories, consider ways to modify the recipe or portion size to reduce the calories so that no entrée is excessively high in calories (e.g. no more than 700 calories).
    - Offer more low calorie, competitively priced and appealing side dishes in addition to French fries (e.g. vegetables and fruit prepared with limited fat or sugar).
    - Verify calorie values and monitor portions served to ensure accuracy of calories posted.
    - Offer a range of fresh fruit and vegetable snacks.
    - Replace high-calorie additions in the salad bars (e.g. pasta Alfredo and fried mozzarella sticks).
    - Stock smaller sizes (e.g. 12 oz) of caloric beverages such as soft drinks and juices in place of larger sizes and provide free 16 fl oz cups, ice and water for patrons buying cafeteria items. (One site does this.)
    - Develop policies to support healthier options, such as allowing patrons to substitute fruit or a low calorie side dish in place of French fries when ordering a "combo meal." (One site does this.)

Further evaluation research is required to explore how best to draw patron attention to menu labels, to construct menu alternatives that favor lower calorie choices, and to promote the use of labels for selecting lower calorie food choices in the worksite cafeteria setting.

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APPENDIX 1

Kaiser Permanente Cafeteria Patron Survey

<u>If you are 18 years of age or older</u>, please take a few minutes to complete this survey. Thank you!

1. **In general, how often do you buy food or beverages from this cafeteria at lunchtime?** (check one)

   □[1] Every day □[2] Several days a week □[3] At least once a week
   □[4] Occasionally □[5] Almost never

2. **Have you noticed any information about the *calorie content of menu items* posted in this cafeteria?** (check one)

   □[1] No □[2] Yes □[3] Not sure

3. **Did calorie information influence what you purchased in the cafeteria today?** (check one)

   □[1] No □[2] Yes → **If Yes, how did calorie information influence what you purchased?**

   _____
   _____
   _____

How much do you agree or disagree with the following statements? (check one answer for each statement)	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
4. "Having calorie information available in this cafeteria is useful in making decisions about what to buy"	□[1]	□[2]	□[3]	□[4]	□[5]
5. "Eating establishments like cafeterias should provide calorie information about their foods and beverages"	□[1]	□[2]	□[3]	□[4]	□[5]
6. "By providing calorie information, I feel that Kaiser Permanente is helping me to look after my health"	□[1]	□[2]	□[3]	□[4]	□[5]

7. Are there any disadvantages to having calorie information available in the cafeteria? (check one)

□[1] No □[2] Yes → If Yes, please list the disadvantages:

_____
_____
_____

8. Do you have any suggestions for changing the calorie information provided at this cafeteria?
(check one)

□[1] No □[2] Yes → If Yes, please list the suggestions:

_____
_____
_____

9. Are you currently trying to lose weight? (check one)

□[1] No □[2] Yes

10. Are you male or female? (check one)

□[1] Male □[2] Female

11. What is your age group? (check one)

□[1] 18-29 years □[2] 30-49 years □[3] 50 years or older

12. Which of the following best describes you? (check one)

□ I **AM** a Kaiser employee → **If you are a Kaiser employee, what is your current job category?** (check one)

- □[1] Physician
- □[2] Non-physician healthcare professional
- □[3] Other: (please describe) _____

□[4] I am **NOT** a Kaiser employee but I **AM** a Kaiser health plan member

□[5] I am **NOT** a Kaiser employee and I am **Not** a Kaiser health plan member

13. Which of the following best describes you? (check one)

□[1] Hispanic or Latino/Latina □[2] Non-Hispanic or Non-Latino/Latina

14. Which of the following best describes you? (check one or more)

□[1] American Indian or Alaskan Native □[2] Asian □[3] Black or African American
□[4] Native Hawaiian or Pacific Islander □[5] White □[6] Other

15. What is the highest level of school you have completed? (check one)

□[1] 8th grade or less □[2] Some high school □[3] High school graduate
□[4] Some college □[5] At least a bachelor's degree

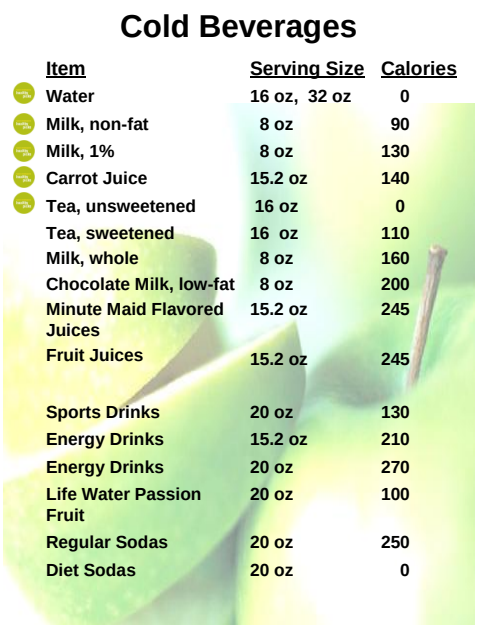
16. Do you have any other suggestions for this cafeteria? (check one)

□[1] No □[2] Yes → If Yes, please list the suggestions:

_____
_____
_____
_____

Please take a minute to fill in anything you may have skipped.
Drop your completed survey into the survey collection box. Thank you!

APPENDIX 2: Menu Board Examples



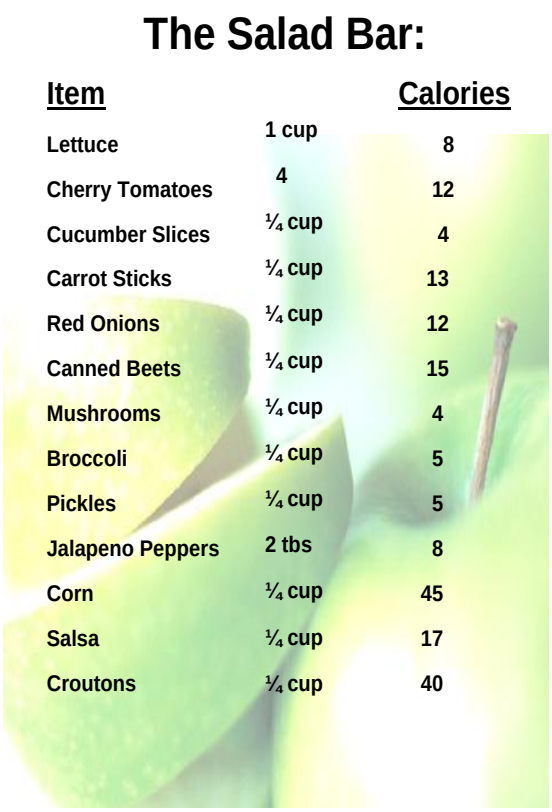
Cold Beverages

Item	Serving Size	Calories
Water	16 oz, 32 oz	0
Milk, non-fat	8 oz	90
Milk, 1%	8 oz	130
Carrot Juice	15.2 oz	140
Tea, unsweetened	16 oz	0
Tea, sweetened	16 oz	110
Milk, whole	8 oz	160
Chocolate Milk, low-fat	8 oz	200
Minute Maid Flavored Juices	15.2 oz	245
Fruit Juices	15.2 oz	245
Sports Drinks	20 oz	130
Energy Drinks	15.2 oz	210
Energy Drinks	20 oz	270
Life Water Passion Fruit	20 oz	100
Regular Sodas	20 oz	250
Diet Sodas	20 oz	0

Hot Item Entrees

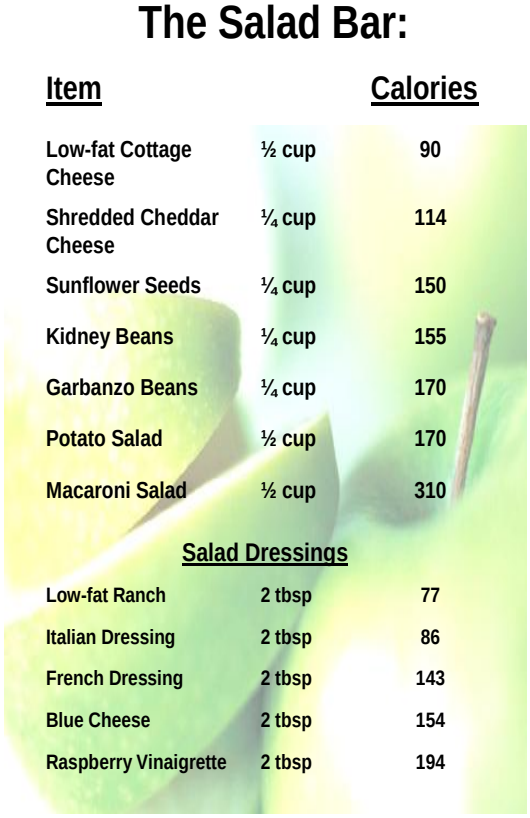
Item	Calories	Price
Beef Burrito Casserole	279	$3.99
Baked Cod	115	$4.25
Cheese Enchiladas (2)	518	$3.99
Cheese Enchiladas Combo (incl. rice, beans & beverage)	N/A	$6.17
Pinto Bean Soup	136 204	$1.66 Sm. $2.33 Lg.

Week 4 Monday



The Salad Bar:

Item		Calories
Lettuce	1 cup	8
Cherry Tomatoes	4	12
Cucumber Slices	¼ cup	4
Carrot Sticks	¼ cup	13
Red Onions	¼ cup	12
Canned Beets	¼ cup	15
Mushrooms	¼ cup	4
Broccoli	¼ cup	5
Pickles	¼ cup	5
Jalapeno Peppers	2 tbs	8
Corn	¼ cup	45
Salsa	¼ cup	17
Croutons	¼ cup	40



The Salad Bar:

Item		Calories
Low-fat Cottage Cheese	½ cup	90
Shredded Cheddar Cheese	¼ cup	114
Sunflower Seeds	¼ cup	150
Kidney Beans	¼ cup	155
Garbanzo Beans	¼ cup	170
Potato Salad	½ cup	170
Macaroni Salad	½ cup	310
Salad Dressings		
Low-fat Ranch	2 tbsp	77
Italian Dressing	2 tbsp	86
French Dressing	2 tbsp	143
Blue Cheese	2 tbsp	154
Raspberry Vinaigrette	2 tbsp	194

Make Your Own Sandwiches

Item	Calories
Smoked Turkey	28 per ounce
Baked Ham	25 per ounce
Roast Beef	32 per ounce
Deli Chicken Breast	27 per ounce
Albacore Tuna	36 per ounce
Chicken Salad	75 per ounce
Tuna Salad	48 per ounce
Chicken Fajita Strips	28 per ounce
Sourdough	36 per ounce
White Bread	260 / 2 slices
Wheat Bread	133 / 2 slices
Rye Bread	133 / 2 slices
Mayonnaise	165 / 2 slices
Mustard	35 / 1 tbs
	10 / 1 tbs

The Grill

Item	Calories	Price
Turkey Burger	305	$3.20
Garden Burger	234	$3.26
Grilled Chicken Sandwich	363	$4.00
Hamburger	443	$2.80
Cheeseburger	513	$3.06
Double Cheeseburger	891	$4.31
Chili Cheeseburger	518	$4.06
Hot Dog	267	$2.53
Grilled Cheese	374	$2.13
Grilled Ham & Cheese	424	$3.46

Snacks

Item	Calories	Price
Orange	62	$0.45
Apple	95	$0.75
Banana	105	$0.35
Grapefruit (whole)	82	$1.45
Fruit Bowl	90	$2.75
Baby Carrots	27	$0.35
Plain Bagel	280	$1.06
Apple w/ Caramel Dip	195	$2.75
Cinnamon Roll	223	$1.40
Croissant	231	$1.40
Cookies		
Sugar Cookie	250	$0.67
Oatmeal Raisin	350	$0.67
Chocolate Chip	370	$0.67
Filled Donut	340	$0.80
Glazed Donut	408	$0.80
Danish	501	$1.26
Muffin	600	$1.80

APPENDIX 3: FINDINGS FROM THE FORMATIVE ASSESSMENT

CHRIS JENSEN AND KAREN WEBB, DECEMBER 2009

BACKGROUND

In a pilot project, Kaiser Permanente (KP) sought to evaluate the provision of point-of-decision calorie information in six hospital cafeterias in California. The proposed evaluation entailed two components: 1) a formative assessment to determine the institutional impact of implementing the provision of calorie information in cafeterias, including the processes, methods, and resources associated with implementation; and 2) a controlled, three-arm intervention study to evaluate the impact of calorie information on patron satisfaction, knowledge, attitudes, and menu item selection. The overall objective of the project was to inform the possible implementation of calorie labeling in all KP cafeterias. This report summarizes the formative assessment of the pilot project.

SPECIFIC AIM 1

TO DOCUMENT THE PROCESSES, METHODS, AND RESOURCES TO IMPLEMENT AND PROMOTE CALORIE INFORMATION FOR MENU ITEMS IN KP CAFETERIAS.

ASSESSMENT OF CAFETERIA SITES

Research staff from the University of California, Berkeley Dr. Robert C. and Veronica Atkins Center for Weight and Health (CWH) visited cafeterias identified by KP to assess their suitability as study sites and to determine requirements for the development of menu boards and/or posters in advance of the start of the intervention trial.

The Food and Nutrition Services (FANS) managers and directors overseeing these cafeterias responded positively to the invitation to participate in the menu labeling project, and offered their full support; it was seen as an addition to several previous initiatives designed to improve the nutritional quality of foods available in the cafeterias, such as provision of salad bars and the identification of *Healthy Pick* menu and vending items.

Program implementation recommendations from the Site Visit

- Achieve a comparable level of *Healthy Picks* implementation at all cafeteria sites to reduce the potential for bias that might result from a differential degree of implementation between sites.
- Prepare and adopt a 4-week cycle menu to be implemented during the 3-month intervention period.
- Obtain recipes for cafeteria menu items and complete nutritional analyses for use in menu board and poster signage.
- Program electronic cashiers where possible to track patron purchases during lunchtime on weekdays during the study period.
- Develop and implement poster and menu board signage.

IMPLEMENTATION

Project Implementation team

Under the leadership of Loel Solomon, Kaiser Permanente National Director, Community Health Initiatives and Evaluation, and Jan Sanders, Kaiser Permanente Director, National Nutrition Services - Procurement & Supply, a project team was formed and met weekly to prepare for the study, including the development and implementation of the menu boards and posters. Other members of the core project team included Joanna Garaventa and Cyndi James as project managers, Carol Akiyama as coordinating dietitian, Katie Gesicki as coordinator of project-related communications, and Karen Webb and Chris Jensen as researchers from the CWH. Many others participated in the weekly project team meetings as

needed including dietitians involved in recipe nutrient analyses, and FANS directors and managers at the study sites.

The study implementation began with baseline data collection in Northern California KP facilities on 8/4/08, approximately 12 weeks after the *Site Visit Summary Report* was issued.

Key project team implementation goals

- To obtain the necessary institutional review board approvals for the project.
- To ensure a comparable level of *Healthy Picks* implementation at each site prior to the start of the intervention study.
- To direct and coordinate the effort of cafeteria sites to select a 4-week cycle menu and to provide recipes for prepared cafeteria items.
- To recruit and coordinate the efforts of 2 KP dietitians to perform calorie and nutrient calculations (hereafter referred to as nutrient calculations) on cafeteria recipes using existing nutritional analysis software (Food Processor, ESHA) and 2 existing KP laptop computers.
- To identify the types of signage needed and to coordinate the development of the menu board and poster signage for each site.
- To develop and disseminate appropriate and relevant email communications to various KP stakeholders.
- To complete inventory checks of consumer packaged goods sold in the cafeterias, such as snacks and beverages.

Perceptions of project implementation

Overall response: At the end of the project, phone interviews were conducted with groups of key stakeholders including core project team members, FANS directors and managers, and dietitians who conducted the calorie determinations. Responses were consistently positive. There was widespread enthusiasm about having participated in the pilot, which was perceived to be a worthwhile and relevant initiative. Specific comments related to the value of having the nutrient analyses for many of the items offered for sale in the pilot sites, and to the overall value to KP patrons and KP itself as a healthy worksite model. Examples of responses from the interviews include:

> "It was excellent to receive cycle menus and recipes for prepared foods from all six participating hospitals and to trial a process for calorie and nutrient calculations. This was no small feat, but now we at KP have made a start."

> "The project is important, and it was a pleasure to contribute to something meaningful."

> "The patrons loved it and we've had lots of good feedback."

Timelines: Although overall the project was viewed as useful and beneficial, most team members felt that extending the project timeline could have allowed for improved quality control, with more precise project refinements made before implementation and testing.

> "The time did not allow us to do our best job and make use of the calorie information for verifying recipes and/or improving the menu items."

The initial project timeline called for the 4-week cycle menu to be finalized and recipes to be obtained within a period of 3 weeks (Southern California had more time because they were starting 1 month later). This timeline proved to be too short, as it sometimes took longer to obtain recipes and deal with errant, incomplete, or missing recipes. Ultimately, the deadline for completing nutrient calculations was

extended by 7 weeks, which allowed for problem-solving. Project team members were able to accommodate last-minute adjustments in nutrient values which were needed for signage.

Calorie calculation process: Overall, despite limited time, the food service personnel and dietitians were successful in compiling a great deal of information (i.e., recipes and nutritional information) needed to prepare signage and menu boards for the project. The team was pleased by how much was accomplished in a short period of time including, menu and recipe documentation, nutrient calculations, implementation of menu labeling, and timely evaluation. However, there were indications of areas for improvement in the process. Problems that were identified provide guidance that will be invaluable when future programs are implemented.

- Some recipes were not initially supplied and a number of the recipes supplied incomplete or questionable information (e.g., vague ingredient descriptions, inconsistent cooking instructions, and/or missing or implausible serving sizes) so that calorie calculations could not be made without further questioning of food service personnel.

- It was sometimes difficult to obtain the additional recipe information from cafeteria sites to complete nutrient calculations. Communication between dietitians and food service managers was difficult via email. For example, on some occasions the food service managers were unclear about what information was required, and dietitians did not receive the requested information without several attempts.

- Five of the six study sites had portion sizes that were in close agreement with the calorie calculations. However, at the Sacramento site, the recipe serving sizes were not always consistent with actual portion sizes served.

- In general, the process would have benefited from an increase in time to obtain and verify all the recipe information, and to conduct the nutrient calculations.

Menu board and poster development: Signage development was coordinated within KP. The original plan was to purchase and install fixed menu boards similar to those present in the San Jose cafeteria and in fast food restaurants. This was dropped in favor of simple on-the-counter menu board signs that were designed in-house, sent to cafeterias by email, and printed by the cafeteria managers or FANS directors/managers. Menu boards were produced in-house using PowerPoint software. Posters were developed within KP using Excel software and enlarged and mounted at a local photocopy center. The advantage of this approach was that menu board signage was relatively simple to develop and print, inexpensive, didn't require KP Facilities staff to install, and it was easy to make changes when needed. For example, the Baldwin Park facility was able to successfully make changes to hot entrée menu boards as needed. The signs in the menu board sites were viewed by the project team members and FANS directors and managers as attractive and professional.

"This gives us a good model to use in the future."

RESOURCES AND EXPENDITURES

Resources

In addition to the efforts of the KP leadership team and project management staff, the efforts for other KP core project team members or affiliate members were as follows:

- Carol Akiyama: 90 hours – weekly project team meetings, coordinating work of dietitians, signage development.
- Katie Gesicki: 50 hours – weekly project team meetings, communications, signage development.
- Two dietitians: 326 hours – verifying ingredients and analyzing about 2000 recipes.

Additional Study-Related Expenditures

Additional expenses incurred in the execution of the project included the following:

- Three Food Processor software licenses were purchased for $450.
- Five posters were developed and shipped by overnight mail at a cost of about $1,074.
- Other project-related costs totaled about $1,111, and for flash drives, overnight shipping, and travel to sites.

SPECIFIC AIM 2

TO DOCUMENT THE EXTENT TO WHICH CALORIE LABELING INTERVENTIONS IN KP CAFETERIAS WERE IMPLEMENTED AS INTENDED.

The posting of menu boards and posters at each site was verified by CWH research staff on a weekly basis during the last 4 weeks of the intervention period. At each of four site visits to the cafeterias during the intervention period, posters were found to be in place on tripods in the cafeterias, either at the entry or exit of the facilities.

Menu boards for the hot entrees required changing on a daily basis. This was consistently accomplished at the Baldwin Park site. At the Sacramento site, menu boards were not posted on two occasions when CWH staff were present collecting data. However, when this was pointed out the correct menu boards were promptly posted.

To conduct a quick check that calorie values on menu boards and posters accurately reflected those contained in actual meals served, portions were observed in cafeteria sites by CWH nutrition researchers on data collection days. While almost all of the cafeteria sites had actual portion sizing that successfully matched serving sizes stipulated in recipes, there was one site where entrée portion sizes tended to be larger than stipulated in recipes. **Table 1** provides a comparison between the recipe serving sizes and calories for five entrees, calculated (posted) and actual (measured). The average actual serving sizes were larger than recipe serving sizes for each entree, and the difference in calories ranged from 214 to 363 calories.

Table 1. Comparison of recipe serving sizes and calories and average actual serving sizes and calories.

Entrée	Calculated Recipe Serving Size (lbs)	Recipe Serving Size Calories	Actual Serving Size (lbs)	Actual Serving Size Calories	Estimated Calorie Difference
Broccoli beef with rice	0.64	277	1.29	558	+281
Chicken rice bowl	1.13	537	1.58	751	+214
Tomato mozzarella pasta	0.47	271	1.10	634	+363
Baked beef rigatoni	0.59	345	1.00	582	+237
Salmon, barley, and vegetables	0.64	441	1.05	724	+283

Calories for recipes were calculated using Food Processor software from ESHA, version 10.1.
Estimated calorie difference = actual serving size calories – recipe serving size calories

These findings, if confirmed, indicate the need to ensure that portions served in all facilities consistently reflect the portions used for nutrient values shown on menu labeling and poster signage. In some cases this may require reducing portion sizes served.

Finally, it was beyond the scope of this assessment to determine the extent to which recipes were followed in preparing foods. However, to ensure the accuracy of calorie values on menu boards and posters, it would be desirable to institute a process for assessing adherence to recipes.

SPECIFIC AIM 3

TO IDENTIFY POTENTIAL INSTITUTIONAL-LEVEL IMPACTS OF IMPLEMENTING MENU LABELING SIGNAGE AND THE NEED FOR TECHNICAL ASSISTANCE TO FACILITATE IMPLEMENTATION.

INSTITUTIONAL-LEVEL IMPACTS

One of the potential benefits of menu labeling is that the labeling process itself may lead to institutional level changes that result in more healthful food choices for patrons. Such changes might include reducing portion sizes or changing some of the types of foods offered. In the process of implementing menu labeling and observing the operations and policies at the different cafeteria sites, we identified a number of innovative approaches currently in place at select sites which result in more healthful and lower calorie choices for patrons. Employing these innovative approaches across sites is an additional way to achieve the goal of increasing healthful food choices:

- Stock a full array of relatively low-calorie and healthy salad bar ingredients and minimize the inclusion of high-calorie additions in the salad bar station, such as pasta Alfredo and fried mozzarella sticks.

- Stock smaller sizes (e.g., 12 oz) of caloric beverages such as soft drinks and juices in place of larger sizes, stock a variety of diet beverages, and provide free 16 fl oz cups, ice, and access to water for patrons buying cafeteria items.

- Develop policies to support healthier options, such as allowing patrons to substitute fruit or a side salad in place of French fries when ordering a "combo meal," and by providing a selection of low-calorie dressings for salads.

NEED FOR TECHNICAL ASSISTANCE

The technical assistance needed to facilitate menu labeling implementation included the following:

- Assessment of signage needs and development of signage. This assistance was provided by the CWH research staff and KP project management.

- Evaluation of recipes and performance of nutrient calculations. This assistance was coordinated by a KP dietitian and carried out by two contract dietitians.

SPECIFIC AIM 4

TO UTILIZE THE INFORMATION OBTAINED IN THE FORMATIVE ASSESSMENT TO REFINE THE IMPLEMENTATION AND EVALUATION OF THE INTERVENTION, AND THE POSSIBLE FUTURE IMPLEMENTATION OF CALORIE LABELING OF MENU ITEMS IN ADDITIONAL KP CAFETERIAS.

The following summarizes discussions with KP stakeholders directly involved in the project regarding lessons learned and implications for implementing calorie labeling in additional KP cafeterias:

- **Most individual KP cafeterias do not have the resources or technical expertise to independently implement menu labeling**. The process of obtaining and verifying recipes, and conducting nutrient calculations is labor intensive and requires specific expertise, software, and computers not available at most cafeterias. Possible options to address this need include:

    - Contracting for this function, perhaps through the vendors that run cafeterias.

    - Redeploying or hiring a dietitian and possibly a project manager to provide the necessary technical assistance to individual cafeterias.

- **Each cafeteria presents its own unique challenges to the successful implementation of menu labeling**. For example:

    - Sites have different menus and menu cycles. Thus, nutrient calculations are likely to be unique to a site.

    - Sites may not always have recipes, may not always cook to recipes, may have an incomplete catalog of recipes, or may not serve portion sizes indicated in recipes. Thus, recipe development and training on cooking/serving methods may be needed.

    - Some sites utilize counter-top menu boards for which new signage would be simple to execute, whereas other sites have formal and costly menu boards affixed to walls. Where possible, use of counter-top menu boards is simpler and less costly.

- **The project demonstrated ways to overcome obstacles.** Specifically, the project involved multiple organizational layers working in different locations, including regional staff who conceived the project, project team members and affiliated members who sought to develop signage and prepare for the study, facility-level dietitians overseeing the cafeteria and cafeteria managers directly responsible for implementing menu labeling on a daily basis. Considerable effort was made to communicate across and between layers. Nonetheless, there was incomplete understanding of the scope and objective of the project at the level of the cafeteria, and frustration at times with the pace and efficiency of communication between cafeteria staff and dietitians conducting nutrient analyses. Having all organizational layers represented at weekly project team meetings facilitated improved communication and a clearer understanding of the scope and goals of the project. Also, a longer timeline was needed to obtain accurate nutrient calculations for the menu items served.

- **Verification is needed to ensure consistent posting of proper menu labeling signage.** This can be accomplished through development of standard operating procedures, training of cafeteria staff, and supervision from the FANS directors and managers.

SPECIFIC AIM 5

TO PROVIDE GUIDANCE FOR HOW CAFETERIA REVENUE AND COSTS COULD BE CAPTURED IN ORDER TO ASSESS THE NET REVENUE IMPACT OF THE PROVISION OF CALORIE LABELING IN KP CAFETERIAS.

RECOMMENDATIONS ON METHODS FOR DOCUMENTING COSTS OF THE INTERVENTION

The objective is for KP to document the personnel time and any direct costs (on the part of KP and contractors) devoted to planning, implementing, and maintaining the intervention. These recommendations are based on a cost documentation system suggested by William Dow, PhD, Associate

Professor of Health Economics, UC Berkeley School of Public Health, addressing: 1) the KP personnel time and any direct costs devoted to planning, implementing, and maintaining the intervention; and 2) profits/losses due to changes in food costs associated with the calorie labeling intervention. The following recommendations were shared with KP in a report and in several project team discussions:

- Start-up costs (i.e., where KP are taking time to work out what to do and how to do it, including the launch) should be calculated separately from maintenance costs (e.g., keeping the intervention going, re-publicizing the intervention from time to time, nutrient analysis of new menu items introduced, etc).

- Documentation of start-up costs would include: personnel time (at KP and the contractors and CWH) x salary costs, and any direct costs for materials, etc, related to:

    - ❖ Planning the intervention (distinct from planning the evaluation) including meeting time, site visits, conversations, emails, "homework," and getting quotes.
    - ❖ Managing the process, reformulating recipes, and calculating and verifying calorie values.
    - ❖ Planning and implementing promotional activities to launch the intervention.
    - ❖ Costs of creating, printing, and installing new signage.
    - ❖ Costs of any other activities KP identifies as related to implementing the intervention.

- Maintenance costs for the intervention would be documented once the intervention was underway.

PROFITS/LOSSES DUE TO CHANGES IN FOOD COSTS ASSOCIATED WITH THE CALORIE LABELING INTERVENTION

A two-stage process is recommended:

Stage 1 would entail calculating changes in the number of purchases of targeted items and other items in target categories (e.g., hot entrees, soups, grill sandwiches, self-serve beverages, etc). This is the same information that is being collected to evaluate the effects of the calorie labeling interventions on patron purchases of healthier foods, and methods for collecting these data are still being developed. If there is no observable change or very small changes in the proportion of targeted items purchased, then stage 2 would be unnecessary.

Stage 2, if necessary, would entail working with vendors in site cafeterias, and/or KP cafeteria managers, to calculate (retrospectively) the profits/losses over the intervention period from their invoices on food costs relating to this time period. A key issue is whether contract vendors will share their revenue and profit loss data. Note: It would be unlikely that a cafeteria would show greater losses after intervention, even if food costs went up, as a profit-based company would just add a percent mark-up to the food items and therefore charge more. Thus, prices for menu items in target categories could be monitored over the intervention period.

In the event that the number of purchases of targeted items and other items in target categories cannot be obtained, total sales for the month or two prior to implementation, compared with total sales for a couple of months after intervention, might serve as a proxy.