

Healthier Vending and Snack Bar Policy Project

2015-2016 Grantee Evaluation

Executive Summary

Project Background

The primary objective of the Healthier Vending and Snack Bar Grant is “to provide businesses with guidelines for incorporating healthier food and drink options in vending machines and snack bars at their workplaces¹.”

The project guide for worksites serves two purposes:

- 1) Inform employees about what they are eating and which choices are healthier.
- 2) Increase choice, not restrict choice. The policy is designed to make healthier choices more accessible, more appealing, and more affordable. It is not designed to restrict choices.

The project relies in part on the Munch Code, which classifies foods by color:

Green foods and drinks are the healthiest options and can be enjoyed often

Yellow foods and drinks have added sugar, fat, and calories and should be eaten occasionally

Red foods and drinks are the highest in sugar, fat, and calories and the least healthy, which should be eaten sparingly¹

Evaluation

The project has currently completed its third year of implementation, and the objective of this report is to evaluate the program’s extent of success using three approaches:

1. **Final Progress Reports:** Each of the 15 worksites completed a final progress report requesting outcomes, successes, whether the worksite implemented a Healthier Vending and Snack Bar Policy, future plans, and any additional feedback.
2. **Additional Evaluation Questions:** Eight additional questions were asked to the 15 worksites, each asking about specific changes and improvements the site may have implemented.
3. **Vending Machine and Snack Bar Analysis:** 12 of the 15 worksites completed a vending machine and snack bar analysis to determine how the food and drink items offered are distributed across the Munch Code color categories.

Final Progress Reports

Of the 15 worksites, 8 have implemented a Healthier Vending and Snack Bar Policy; the majority of worksites that have not done so plan to do so in the future as their efforts progress. The most common challenges reported involved gaining the cooperation of vendors to ensure a consistently-labeled supply of healthier vending and snack bar options, as well as locating green options in general (for example, many items that would have otherwise been labeled “green” were instead in the yellow or red categories due to portion size). Despite these challenges, the worksites felt they were generally successful in their efforts to increase the percentage of green options and create awareness of healthier food options among their employees. The great majority of worksites reported very positive comments from employees, who enjoyed having a greater variety of choices and the ability to evaluate their choices quickly using the Munch Code. Some worksites even reported that their employees’ healthier snack choices extended to purchases they were making outside of

¹ South Dakota Healthier Vending and Snack Bar Policy Implementation Guide; retrieved from http://goodandhealthysd.org/content/uploads/2014/09/ModelPolicy_HealthyVendingSnackBar_ImplementationGuide.pdf

work. Most sites explicitly mentioned plans to continue to implement the Munch Code, and to monitor the availability of healthier food choices to their employees in the future.

Additional Evaluation Questions

From the additional analysis questions, 85% or more of the worksites implemented each of the following:

- changes to product placement/attractiveness
- changes with respect to stickers or signs
- changes regarding information provided at point of purchase

33.3% or fewer of the worksites did each of the following:

- make pricing changes (some worksites’ comments imply this may be due to vendors setting prices)
- conduct staff surveys (some sites reported informal interaction with staff in place of a formal survey)
- make contractual changes with vendors (some of the worksites indicated contractual changes were not necessary in order to change the items being provided)

From this, it is clear that a number of positive and informative changes are straightforward and can be accomplished without difficulty with the support of the Healthier Vending and Snack Bar Policy Project; while other changes were perhaps more difficult, accompanying comments indicate they did not provide major barriers to accomplishing the goals of the project.

Vending Machine and Snack Bar Analysis

From the vending and snack bar analysis, all 12 reporting worksites made positive shifts toward greater percentages of green and yellow Munch Code items; eight of the worksites made statistically significant, positive shifts in at least one of the vending and snack bar locations they analyzed. This is evidence for the effectiveness of the Healthier Vending and Snack Bar Policy Project, and shows unequivocally that these worksites are willing and able to make positive changes regarding the food choices they offer to their employees.

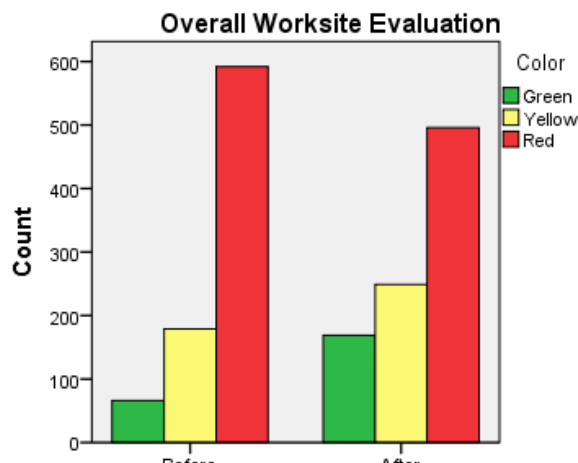
Table 17 shows the distribution of items of each Munch Code color category over all worksites before and after implementation; Figure 16 shows this distribution visually in a bar chart. The percentage of green items increased from 7.9% to 18.5%, while the percentage of red items decreased from 70.7% to 54.3%. **This shift was positive and highly statistically significant.**

Table 17.

Time		Color			Total
		Green	Yellow	Red	
Before	Count	66	179	592	837
	% within Before	7.9%	21.4%	70.7%	100.0%
After	Count	169	249	496	914
	% within After	18.5%	27.2%	54.3%	100.0%

$\chi^2 = 0.336, p < 0.001$

Figure 16.



Final Progress Reports

The final progress report focuses on five areas: outcomes (specifically challenges or barriers experienced), successes, implementation of a healthier vending and snack bar policy, future plans, and feedback.

Outcomes/Challenges or Barriers

A challenge that was very commonly reported by the worksites was interacting with vendors. Specific challenges included contacting vendors, making timely changes to food items provided, having contractual obligations to vendors that limited the healthy items that could be provided, getting vendors to supply more green and yellow items consistently (or at all), and maintaining a system of organization in vending machines and snack bar placement that correctly identifies healthier items. Vendors seemed reluctant to supply healthier items as they were concerned about the impact it might have on sales, or in some cases because there were not very many healthier items available from their suppliers. To meet these challenges, worksites reported using tactics such as developing deadlines for vendors, posting nutritional information in such a way that would not be ambiguous if items were rearranged (e.g., a poster outside of the vending machine identifying nutritional information), communicating weekly with their vendors, and in several cases changing vendors (or even removing vending machines entirely) because the previous vendor was unable to accommodate requests for healthier snack items.

There were other challenges mentioned by worksites that were not directly related to vendors. Several worksites mentioned a lack of available time to meet with wellness group members or being short staffed. Some worksites also found it difficult to locate green items on the market, particularly due to portion size that pushed some otherwise green items into the yellow or red categories (one worksite explained that they “ended up just fudging and labeling the ‘slightly’ red items as green or yellow” while continuing to search for appropriately-sized items). Finally, one worksite found that Appendix B was not large enough for their food and beverage analysis and created their own worksheet to accomplish this.

Successes

In general, the worksites reported many successes. Many of the worksites reported that they had been wanting to address the issue of healthier vending and snacks for some time, and this project provided them with the support they needed to move forward with that goal. Despite the challenges already discussed, worksites were ultimately able to increase the percentage of green items offered by adding additional green items, removing red items, or doing a combination of both. Worksites were able to successfully label green choices and display them in ways that were more likely to appeal to employees. Several worksites reported creating reward programs for employees who purchased green items. Worksites also reported success with food tasting events, meetings with dietitians/nutritionists, and even a “fruit club” at the South Dakota Wheat Growers Admin Office.

Worksites quite commonly reported that employees and other vending and snack bar customers were indeed selecting healthier snacks. Employees also appeared to be thinking about and discussing their food and nutrition choices more frequently than in the past, and even expressed that they were making healthier choices at home. In most cases administration also seemed very supportive of the efforts undertaken as part of the project.

Implementation of Healthier Vending and Snack Bar Policy

Of the 15 worksites, 8 (53.3%) have officially implemented a healthier vending and snack bar policy. Among the sites that had not at the time of the survey, most indicated that they were still working on such a policy and it would be incorporated into their company policies at a later date. Reasons for the delay included being short handed, lacking time, or having a large number of additional worksites. One worksite (Spader Business Management) had removed their vending machines and so would not be implementing a policy based on the Munch Code. At Wagner Community Memorial Hospital, the CEO made the decision not to implement a Healthier Vending and Snack Bar Policy in order to avoid imposing a policy on staff requiring them to purchase healthier choices.

Future Plans

Most worksites cited future plans to continue implementing the changes that had been made, particularly with respect to identifying food choices according to the Munch Code colors, encouraging employees to make healthier choices through signage and available information, searching for and increasing the percentage of green items available in vending machines and at snack bars, and monitoring vendors to ensure that healthier options continue to be incorporated into the food choices available to employees. Several worksites mentioned reward programs for employees who purchase green foods, some of which have already been implemented and will be maintained, while others will be developed in the future. Other worksites mentioned future implementation of staff surveys and reaching out to employees to evaluate the success of the programs. One worksite (United Hardware) plans to provide quarterly material on healthy lifestyles to employees, while another (Kolberg-Pioneer Inc.) has provided information about the Munch Code in its monthly employee newsletter and will continue to include information in future issues.

Feedback

For most worksites, the majority of feedback reported was quite positive. Employees tended to enjoy the variety of food and appreciated being able to use the Munch Code color coding to immediately identify healthier choices. It was common for worksites to mention that employees and other worksite visitors did seem to be making more conscientious choices at the point of purchase. Employees also commented that they would change their purchasing habits (e.g., begin to purchase from vending) due to the inclusion of healthier foods in more settings. In general, the comments supported the success of the program goal of increasing choice rather than restricting less healthy purchases. Interestingly, several worksites commented that employees mentioned they were purchasing some of the green items they had tried at the worksite for consumption at home, in order to increase the healthy eating habits of their families.

One worksite commented that it would be desirable to have a “second level” of the Healthier Vending and Snack Bar grant available that would allow for extending the program to entrée foods, and provide potential for continuous, long-term motivation. Another worksite mentioned that a forum or other opportunities for discussion with other worksites who received a grant would have been helpful for learning about the healthier products that were enjoying success and gaining traction. Only one worksite (Rapid City Regional Hospital) mentioned direct negative feedback from vending users, who initially felt that the Munch Code was a form of policing food choices; however, the site also reported that over time the vending users seemed to understand the labels were to create awareness and to ensure that healthier snack and drink choices were available. RCRH also mentioned there were some

comments that certain items (such as the “whole wheat rice crispy bar”) were labeled green but did not appear to be particularly high in nutrition. Finally, one site (Wagner County Memorial Hospital) received comments that the prices of healthier choices seemed too high, and felt that the more nutritional items were not selling as quickly as the non-nutritional items they had replaced.

Additional Evaluation Questions

Eight additional questions were posed to each of the worksites, under the heading of one main question: **Did your worksite make the following changes/improvements to increase sales of healthier products?** Table 1 provides an overall summary of the responses to these 8 questions.

Table 1. Summary of Responses to Additional Questions

Did your worksite make the following changes/improvements to increase sales of healthier products?	Yes	No	%Yes
Product Placement/Attractiveness	14	1	93.3%
Pricing Changes	4	11	26.7%
Stickers or Sign	14	1	93.3%
Point of Purchase Information	13	2	86.7%
Conduct Staff Survey	5	10	33.3%
Conduct Taste Test	9	6	60.0%
Contractual Changes with Vendor	5	6	33.3%*
Additional Changes	8	6	53.3%^

* 4 worksites responded with "N/A"

^ 1 worksite did not respond to the question

From Table 1, sites were very likely to implement changes to produce placement/attractiveness, changes relating to information stickers or signs, and changes with respect to providing point of purchase information. Sites were very unlikely to make pricing changes (which may be due to vendors setting prices), conduct staff surveys (some sites reported informal interaction with staff instead), or make contractual changes with vendors (some of the worksites indicated contractual changes were not necessary in order to change the items being provided).

The sections that follow review the responses to each question in more detail, and include comments from the worksites.

Product placement and attractiveness

Of the 15 worksites, **14 (93.3%)** responded that they had made changes with respect to product placement and attractiveness.

Several of the worksites made additional comments:

- Bank West: "We actually found a healthy vending machine company and installed one of their machines on site."
- Grossenburg Implement: "We used the stickers and educated the employees on our vending machine. We also substituted some healthy snacks in place of ½ of our rolls on Tuesday that was inspired from what I learned from Melissa Hunt. We also ended up making sure to put healthy choices in our vending machines at most of our other locations."
- Kolberg-Pioneer Inc.: "We moved healthier snacks closer to the checkout station of our micro-market system, as well as moved healthier beverages eye level and on the first 2-3 shelves in the cooler."

- Mount Marty College: “We did not get the healthy items at eye level or along the right hand column, however, they are grouped at the top of the machine and we have finally got the vendor to consistently stock green items in these spaces.”

Pricing changes to promote green and yellow products

Of the 15 worksites, only **4 (26.7%)** reported they made pricing changes to promote green and yellow products. Comments provided by several of the worksites indicated it may be difficult to change pricing due to vendor policies.

Several of the worksites made additional comments:

- Evans Plunge: “Offering Munch Code info and healthier choices moved products enough that price changes weren’t needed.”
- Kolberg-Pioneer Inc.: “Vendor controls price changes.”
- Mount Marty College: “I do not believe we have the ability to set prices per our contract.”

Stickers or a sign to note product categorization and calorie labeling

Of the 15 worksites, **14 (93.3%)** responded that they had made changes with respect to stickers or a sign to note product categorization and product labeling.

Two of the worksites made additional comments:

- Evans Plunge: “Children loved the red, yellow and green stickers and would inquire about them and their meaning. Great opportunity to educate on healthier choices.”
- Kolberg-Pioneer Inc.: “We placed green, yellow, and red stickers on corresponding snacks and beverages to promote health differences between the snacks and beverages.”

Point of purchase information such as large Munch Code signage

Of the 15 worksites, **13 (86.7%)** responded that they had made changes with respect to point of purchase information.

Several of the worksites made additional comments:

- Evans Plunge: “We appreciated having the signage provided as part of the grant.”
- Kolberg-Pioneer Inc.: “Purchased large signage and had them framed for protection from humidity for all four vending areas in our Company, and placed them in a visual location in each area.”
- Mount Marty College: “Additionally, we have full nutritional information for products on the outside of the machine.”
- United Hardware: “Hung from ceiling.”

Conduct a staff survey

Of the 15 worksites, only **5 (33.3%)** responded that they had conducted a staff survey. Comments indicated that some of the sites that had not conducted a survey had plans to do so in the near future.

Several of the worksites made additional comments:

- Avera Sacred Heart Hospital: “Through our committee working to select the newer healthy options and also through taste testing/education events.”
- Evans Plunge: “No formal survey of staff completed but informal chatter prompted changes/new products.”
- Falcon Plastics: “Spring 2015”
- Mount Marty College: “We plan to incorporate questions regarding the munch code system into one of the wellness surveys that we typically send throughout the year.”
- Wagner Community Hospital: “Dietary is going to do this in the near future.”

Conduct a taste test

Of the 15 worksites, **9 (60.0%)** responded that they had conducted a taste test.

Several of the worksites made additional comments:

- Avera Sacred Heart Hospital: “This was such a great way to gain support and “buy in” for the snacks.”
- BankWest, Inc.: “We are doing this next week for our healthy vending machine goods”
- Evans Plunge: “We worked on developing a healthier popcorn recipe w/Megan using less oil and salt. We tried 3 popcorn recipes with our group of regulars who order popcorn each and every time they come to the Plunge. All agreed the “Green Recipe” was very good and we have used it exclusively since that time. I would definitely recommend offering the recipe to another worksite. We also came up with the option of a “Chicken Strip Special” which included taste tests of chicken strips cooked in the Miniveyer Oven rather than deep fried. Taste tests were done for developing cooking times which would promote the best “crunch” of breading.”
- Falcon Plastics: “Healthy Week – November 2016”
- United Hardware: “During dietitian meeting and provided fruit one month to all shifts”

Make contractual changes with the vendor

Of the 15 worksites, 11 answered this question; **5 of 15 (33.3%)** responded that they had made contractual changes with the vendor. However, among those who did not make contractual changes or responded “N/A,” comments revealed that discussions with vendors sometimes took place or vendors were changed in order to provide healthier options for staff.

Several of the worksites made additional comments:

- BankWest, Inc. [had marked N/A]: “Our long-time vendor agreed to make healthier snack options available however that didn’t last long so that’s why we went with a GROW machine.”
- Evans Plunge [had marked No]: “While we did not make contractual changes, I did discuss our Munch Code goals with our primary vendor representative. She in turn researched/provided healthier options for me to consider and brought samples in for us to try.”
- Falcon Plastics [had marked Yes]: “Discuss monthly opportunities and improvements”
- Grossenburg Implement [had marked Yes]: “They are willing to put healthy items in the vending machine if they can buy them from their sales rep and they are not losing money.”
- Kolberg-Pioneer Inc. [had marked N/A]: “No contract needed to get healthier snacks and beverages in our micro-market. We had a verbal conversation about which products we would like added and how we would like them to be displayed, and our vendor complied willingly.”

Were any additional improvements/changes made? If yes, explain...

Of the 15 worksites, 14 answered this question; 8 out of 15 (53.3%) indicated they had made additional improvements or changes.

The worksites that indicated they had made additional improvements or changes made the following comments:

- Avera Sacred Heart Hospital: “We expanded the healthy snacks into our catering processes, and also implemented a new procedure to always send healthy choices as part of our catered events (especially continental breakfasts—reduced pastries, etc.) We will make sure there is always a healthy choice as part of our lunch and evening caterings as well.”
- BankWest, Inc.: “The GROW healthy vending machine has been very popular. We have the model that has both snacks and drinks and employees are really loving having other options that are better nutrition wise.”
- Evans Plunge (comments from two individuals):
 - “Enhancements were made to our product display cabinets not only for placement of product but we also added new products, matching baskets, lights, and additional signage. I believe both staff and patrons benefitted from our Munch Code education as I have personally viewed better food choices being made by many. It was delightful to see a happy parent pull an organic applesauce pouch out of the cooler for a toddler and remark to her about EP “having something good for you to snack on”. Moving forward, we will continue to offer additional healthier choices in addition to general concession fare as we research more available snack options. We appreciate having been a past recipient of a Munch Code Grant and hope others will take advantage of this opportunity to educate on healthy food choices as well.”
 - “We increased the ratio of our green to yellow and green to red products considerably after conducting a comprehensive review of each snack/food item we carried. This resulted in decreased red items and a noticeable increase in yellow and green food items.”
- Falcon Plastics: “Added a sticker incentive to purchase green and yellow items for 6 months. The more healthy items purchased the employee won a prize.”
- Grossenburg Implement: “We cut our Tuesday treat roll order in half and used that money to be “green” items to serve for Tuesday treats. Most of the other locations are also buying sugary foods less often and substituting with healthier options.”
- Mount Marty College: “In addition to the changes to the vending machine, the college bookstore has a new rack of healthy snacks labeled[sic] per the munch code system. The bookstore gets a lot of traffic, both students and employees.”
- Rapid City Regional Hospital: “Vendor willing to offer different and more green choices.”
- Spader Business Management [had marked No]: “The decision was made to remove all vending machines from the break room due to difficulty of getting healthier products and having them consistently stocked by the vendor. The push back from employees, as a result, has not been significant.”
- Wagner Community Memorial Hospital: “We are in the process of taking over the management of our chilled vending machine due to low usage and high prices from our previous supplier.”

Vending Machine and Snack Bar Analysis for 15 Worksites

Each worksite reviewed the content of their vending machines or other points of purchase to determine the percentage of items that fell into the Munch Code categories of green, yellow, and red. All sites performed this review before and after implementing changes related to the Healthier Vending and Snack Bar Grant. Each site is analyzed individually in the following sections. Note that of the 15 sites, three of them (Spader Business Management, United Hardware, and Vast Broadband) did not complete this analysis.

Avera Sacred Heart Hospital

Avera Sacred Heart Hospital maintains both a snack bar (the Northern Lights Café) and vending.

Snack Bar:

Table 2 shows the distribution of items of each Munch Code color category in the snack bar before and after implementation; Figure 1 shows this distribution visually in a bar chart. The percentage of green items increased from 29.5% to 34.9%, while the percentage of red items decreased from 41.0% to 31.7%. **This shift was positive but was not statistically significant².**

Table 2. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	18	18	25	61
	% within Before	29.5%	29.5%	41.0%	100.0%
After	Count	22	21	20	63
	% within After	34.9%	33.3%	31.7%	100.0%

$\gamma = 0.145, p = 0.318$



Figure 1. Bar chart of distribution of food items by Munch Code color, before and after implementation

² The gamma statistic is a correlation-type statistic that determines whether the change in the time period is related to a shift in the ordered Munch Code categories, to an extent that would be unlikely to occur due to random changes in items. A positive gamma indicates a shift toward a greater percentage of green items; a negative gamma indicates a shift toward a greater percentage of red items. The accompanying P-value is compared to a common significance level of 0.05; if the p-value is less than 0.05, the gamma statistic indicates a statistically significant shift toward green items.

Vending Machine(s):

Table 3 shows the distribution of items of each Munch Code color category for vending at Avera Sacred Heart before and after implementation; Figure 2 shows this distribution visually in a bar chart. The percentage of green items increased from 6.7% to 40.0%, while the percentage of red items decreased from 83.3% to 23.3%. **This shift was positive and was statistically significant.**

Table 3. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	2	3	25	30
	% within Before	6.7%	10.0%	83.3%	100.0%
After	Count	12	11	7	30
	% within After	40.0%	36.7%	23.3%	100.0%

$\chi^2 = 0.829, p < 0.001$

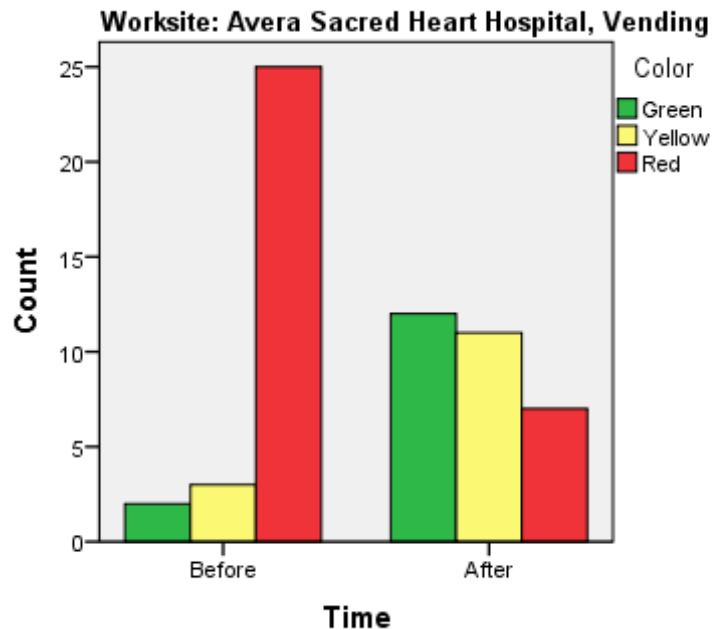


Figure 2. Bar chart of distribution of food items by Munch Code color, before and after implementation

BankWest, Inc.

Vending Machine(s):

Table 4 shows the distribution of items of each Munch Code color category at BankWest, Inc. before and after implementation; Figure 3 shows this distribution visually in a bar chart. The percentage of green items increased from 7.1% to 29.5%, while the percentage of red items decreased from 89.3% to 51.4%.

This shift was positive and was statistically significant.

Table 4. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	4	2	50	56
	% within Before	7.1%	3.6%	89.3%	100.0%
After	Count	31	20	54	105
	% within After	29.5%	19.0%	51.4%	100.0%

$\chi^2 = 0.732, p < 0.001$

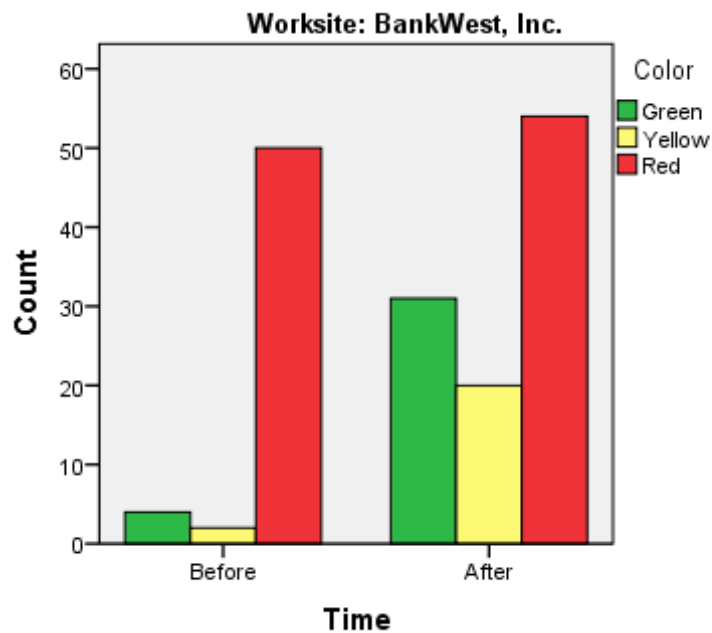


Figure 3. Bar chart of distribution of food items by Munch Code color, before and after implementation

Bel Brands USA

Snack Bar:

Table 5 shows the distribution of items of each Munch Code color category at Bel Brands USA before and after implementation; Figure 4 shows this distribution visually in a bar chart. The percentage of green items increased from 6.3% to 10.4%, while the percentage of red items decreased from 81.0% to 70.1%. **This shift was positive and was statistically significant.**

Table 5. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	9	18	115	142
	% within Before	6.3%	12.7%	81.0%	100.0%
After	Count	16	30	108	154
	% within After	10.4%	19.5%	70.1%	100.0%

$\chi^2 = 0.273, p = 0.028$

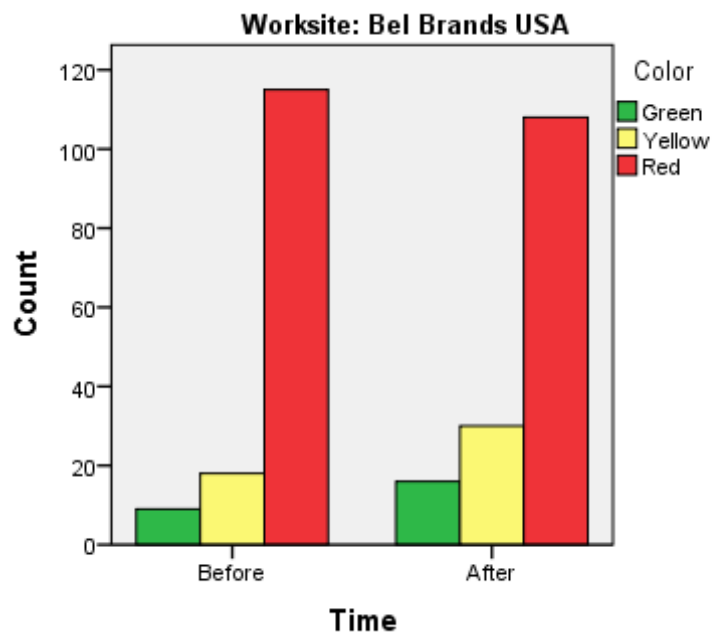


Figure 4. Bar chart of distribution of food items by Munch Code color, before and after implementation

Dakotacare

Vending Machine(s):

Table 6 shows the distribution of items of each Munch Code color category at Dakotacare before and after implementation; Figure 5 shows this distribution visually in a bar chart. The percentage of green items increased from 3.3% to 33.3%, while the percentage of red items decreased from 86.7% to 26.7%.

This shift was positive and was statistically significant.

Table 6. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	1	3	26	30
	% within Before	3.3%	10.0%	86.7%	100.0%
After	Count	10	12	8	30
	% within After	33.3%	40.0%	26.7%	100.0%

$\chi^2 = 0.864, p < 0.001$

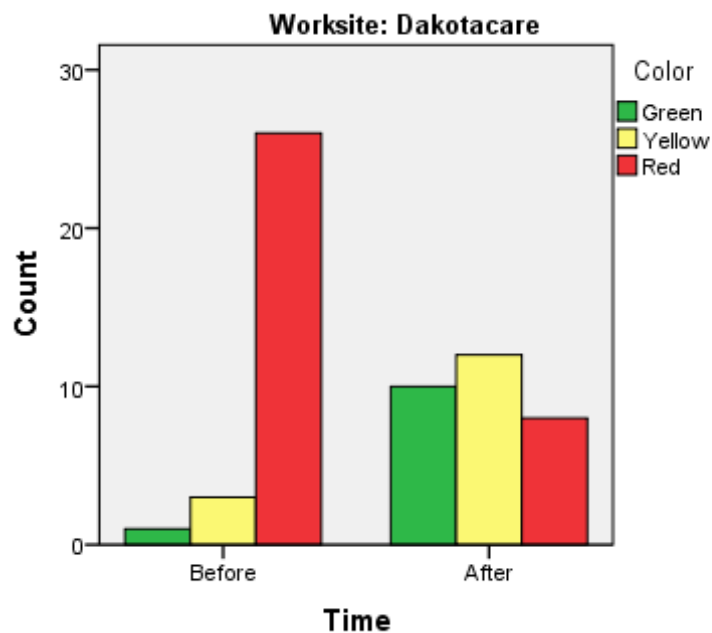


Figure 5. Bar chart of distribution of food items by Munch Code color, before and after implementation

Evans Plunge

Snack Bar:

Table 7 shows the distribution of items of each Munch Code color category at Evans Plunge before and after implementation; Figure 6 shows this distribution visually in a bar chart. The percentage of green items increased from 12.7% to 27.3%, while the percentage of red items decreased from 52.4% to 34.1%. **This shift was positive and was statistically significant.**

Table 7. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	8	22	33	63
	% within Before	12.7%	34.9%	52.4%	100.0%
After	Count	12	17	15	44
	% within After	27.3%	38.6%	34.1%	100.0%

$\chi^2 = 0.351, p = 0.026$

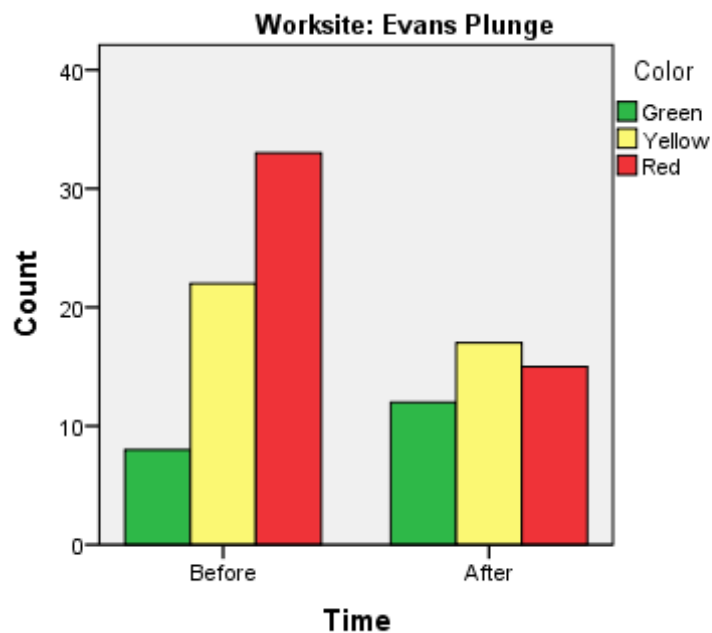


Figure 6. Bar chart of distribution of food items by Munch Code color, before and after implementation

Falcon Plastics

Vending Machine(s):

Table 8 shows the distribution of items of each Munch Code color category at Falcon Plastics before and after implementation; Figure 7 shows this distribution visually in a bar chart. The percentage of green items increased from 9.1% to 36.0%, while the percentage of red items decreased from 63.6% to 38.0%.

This shift was positive and was statistically significant.

Table 8. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	4	12	28	44
	% within Before	9.1%	27.3%	63.6%	100.0%
After	Count	18	13	19	50
	% within After	36.0%	26.0%	38.0%	100.0%

$\chi^2 = 0.506, p = 0.001$

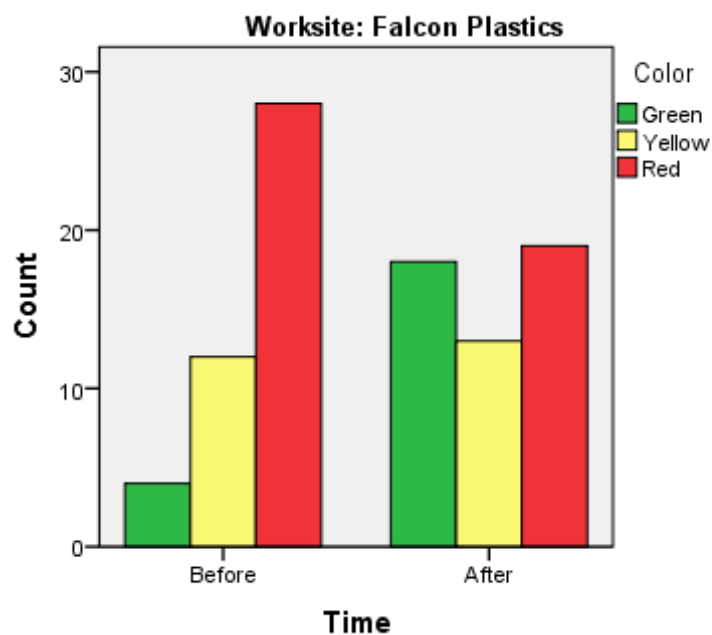


Figure 7. Bar chart of distribution of food items by Munch Code color, before and after implementation

Grossenburg Implement

Vending Machine(s):

Table 9 shows the distribution of items of each Munch Code color category at Grossenburg Implement before and after implementation; Figure 8 shows this distribution visually in a bar chart. The percentage of green items increased from 4.5% to 14.7%, while the percentage of red items decreased from 81.8% to 58.8%. **This shift was positive and was statistically significant.**

Table 9. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	2	6	36	44
	% within Before	4.5%	13.6%	81.8%	100.0%
After	Count	5	9	20	34
	% within After	14.7%	26.5%	58.8%	100.0%

$\chi^2 = 0.500, p = 0.022$

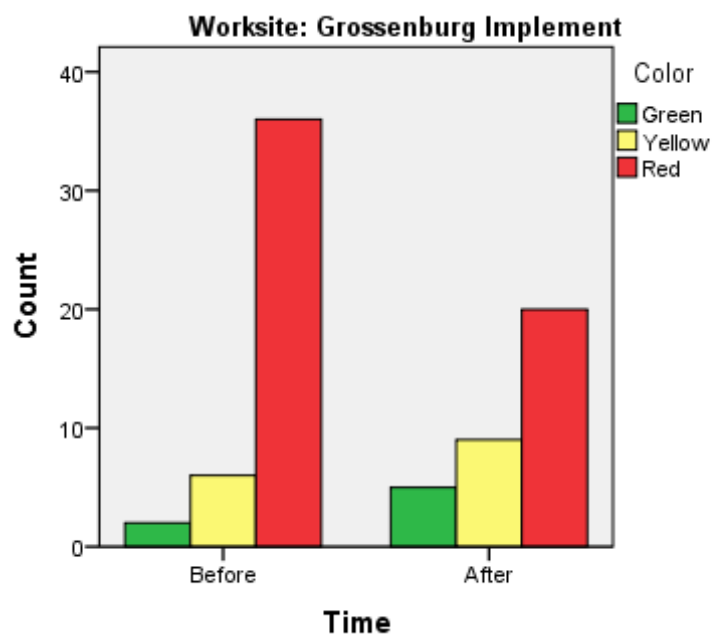


Figure 8. Bar chart of distribution of food items by Munch Code color, before and after implementation

Kolberg-Pioneer Inc.

Snack Bar: (also referred to as a Micro-Market in worksite reports)

Table 10 shows the distribution of items of each Munch Code color category at Kolberg-Pioneer Inc. before and after implementation; Figure 9 shows this distribution visually in a bar chart. The percentage of green items increased from 7.4% to 18.4%, while the percentage of red items decreased from 67.9% to 63.2%. **This shift was positive but was not statistically significant.**

Table 10. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	6	20	55	81
	% within Before	7.4%	24.7%	67.9%	100.0%
After	Count	14	14	48	76
	% within After	18.4%	18.4%	63.2%	100.0%

$\chi^2 = 0.155, p = 0.307$

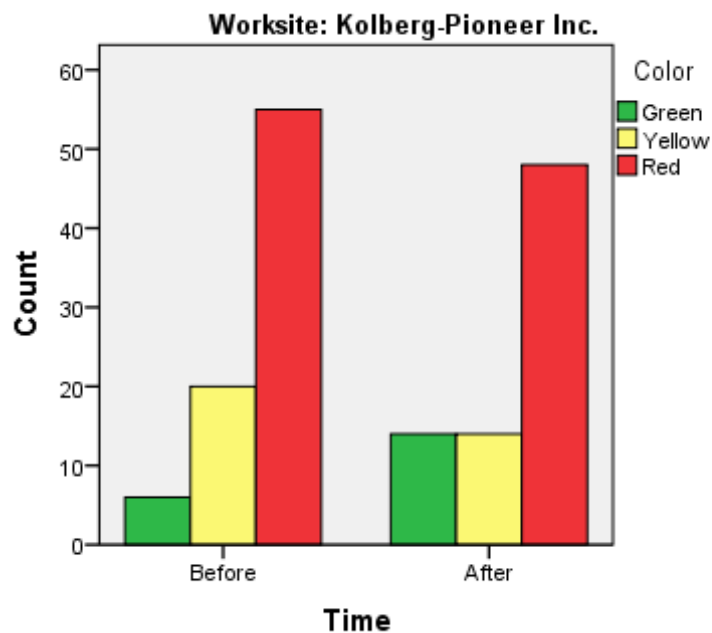


Figure 9. Bar chart of distribution of food items by Munch Code color, before and after implementation

Mount Marty College

Vending Machine(s):

Mount Mary College maintains vending machines in three food purchase locations (Bede Hall, Corbey, and the Welcome Center).

Table 11 shows the distribution of items of each Munch Code color category at Bede Hall before and after implementation; Figure 10 shows this distribution visually in a bar chart. The percentage of green items increased from 15.0% to 20.0%, while the percentage of red items decreased from 65.0% to 60.0%. **This shift was positive but was not statistically significant.**

Table 11. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	6	8	26	40
	% within Before	15.0%	20.0%	65.0%	100.0%
After	Count	8	8	24	40
	% within After	20.0%	20.0%	60.0%	100.0%

$\chi^2 = 0.111, p = 0.589$

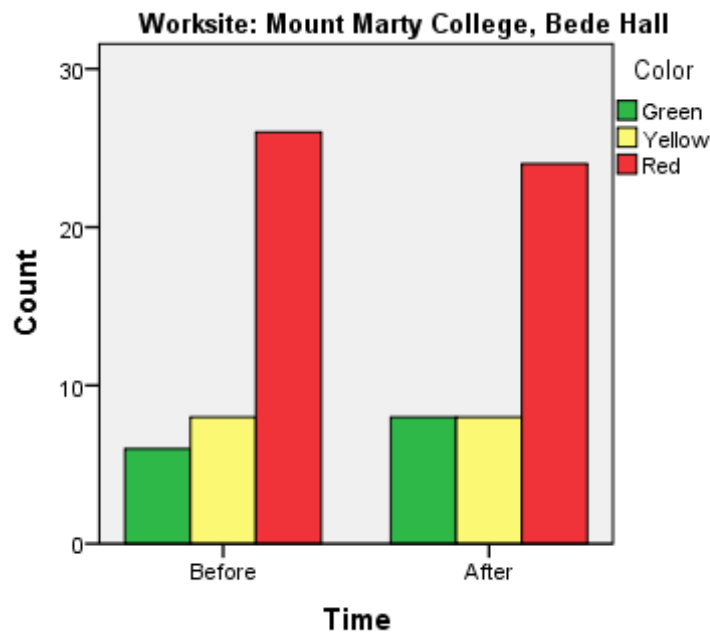


Figure 10. Bar chart of distribution of food items by Munch Code color, before and after implementation

Table 12 shows the distribution of items of each Munch Code color category at Corbey before and after implementation; Figure 11 shows this distribution visually in a bar chart. The percentage of green items increased from 0.0% to 23.1%, while the percentage of red items decreased from 85.7% to 53.8% **This shift was positive and was statistically significant.**

Table 12. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	0	3	18	21
	% within Before	0.0%	14.3%	85.7%	100.0%
After	Count	3	3	7	13
	% within After	23.1%	23.1%	53.8%	100.0%

$\gamma = 0.696, p = 0.031$

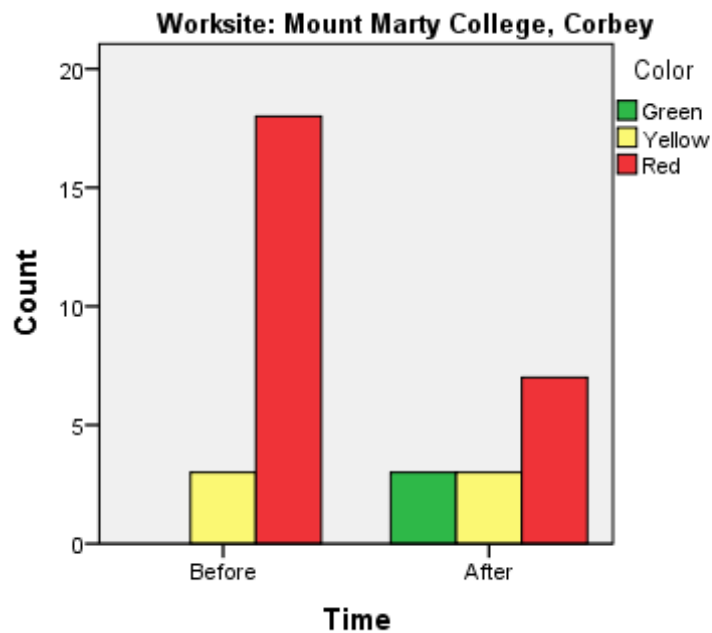


Figure 11. Bar chart of distribution of food items by Munch Code color, before and after implementation

Table 13 shows the distribution of items of each Munch Code color category in the Welcome Center before and after implementation; Figure 12 shows this distribution visually in a bar chart. The percentage of green items increased from 0.0% to 25.0%, while the percentage of red items decreased from 85.7% to 68.8%. **This shift was positive but was not statistically significant.**

Table 13. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	0	1	6	7
	% within Before	0.0%	14.3%	85.7%	100.0%
After	Count	4	1	11	16
	% within After	25.0%	6.3%	68.8%	100.0%

$\chi^2 = 0.511, p = 0.219$

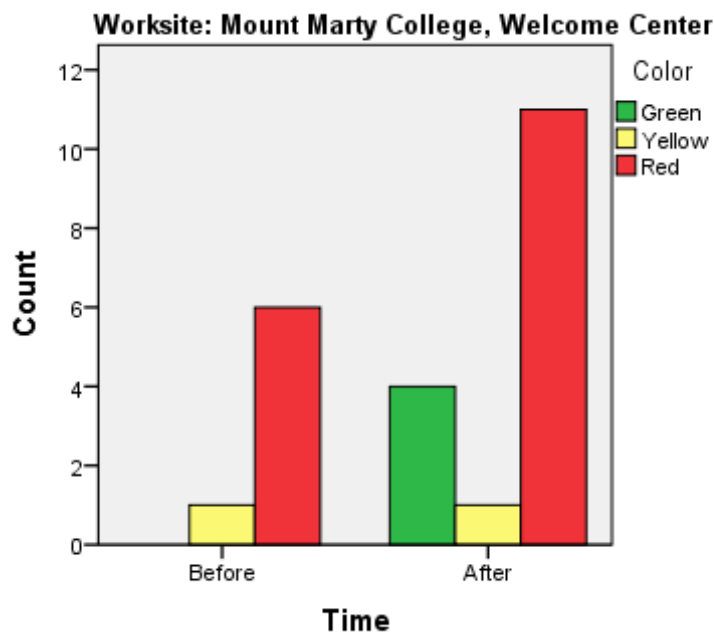


Figure 12. Bar chart of distribution of food items by Munch Code color, before and after implementation

Rapid City Regional Hospital (RCRH)

Vending Machine(s):

Table 14 shows the distribution of items of each Munch Code color category at Rapid City Regional Hospital before and after implementation; Figure 13 shows this distribution visually in a bar chart. The percentage of green items increased from 1.3% to 4.7%, while the percentage of red items decreased from 69.1% to 60.6%. **This shift was positive but was not statistically significant.**

Table 14. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	2	44	103	149
	% within Before	1.3%	29.5%	69.1%	100.0%
After	Count	8	59	103	170
	% within After	4.7%	34.7%	60.6%	100.0%

$\chi^2 = 0.198, p = 0.077$

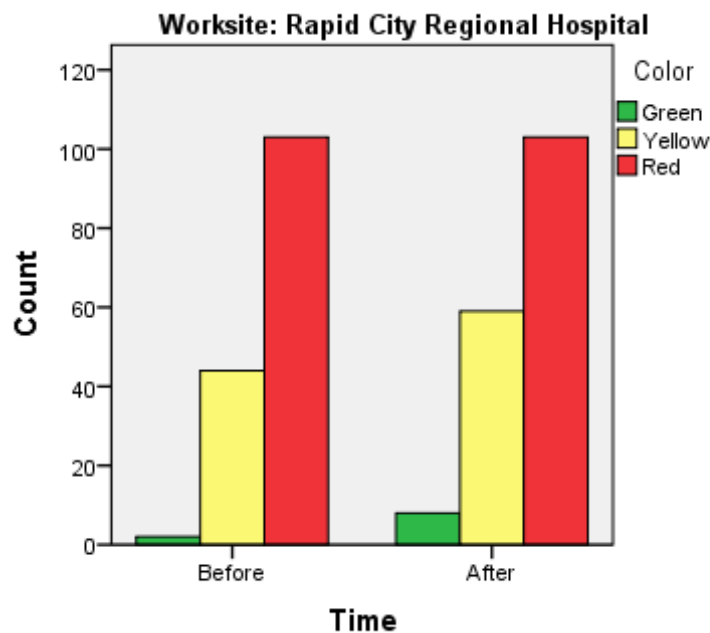


Figure 13. Bar chart of distribution of food items by Munch Code color, before and after implementation

Wagner Community Memorial Hospital

Vending Machine(s):

Table 15 shows the distribution of items of each Munch Code color category at Wagner Community Memorial Hospital before and after implementation; Figure 14 shows this distribution visually in a bar chart. The percentage of green items **decreased** from 5.6% to 2.6%, while the percentage of red items also decreased from 77.8% to 60.5%. **This shift was positive overall, but was not statistically significant.**

Table 15. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	1	3	14	18
	% within Before	5.6%	16.7%	77.8%	100.0%
After	Count	1	14	23	38
	% within After	2.6%	36.8%	60.5%	100.0%

$\chi^2 = 0.335, p = 0.237$

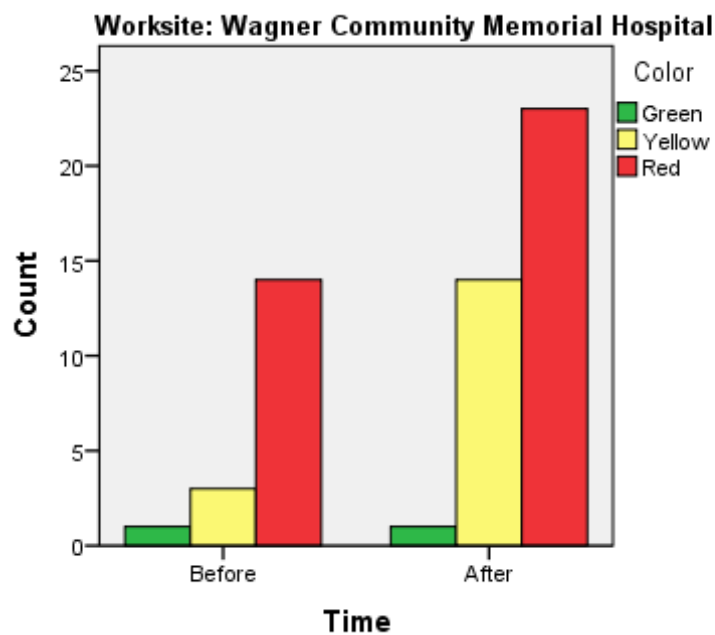


Figure 14. Bar chart of distribution of food items by Munch Code color, before and after implementation

South Dakota Wheat Growers Admin Office

Vending Machine(s):

Table 16 shows the distribution of items of each Munch Code color category at the South Dakota Wheat Growers Admin Office before and after implementation; Figure 15 shows this distribution visually in a bar chart. The percentage of green items increased from 5.9% to 9.8%, while the percentage of red items decreased from 62.7% to 56.9%. **This shift was positive but was not statistically significant.**

Table 16. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	3	16	32	51
	% within Before	5.9%	31.4%	62.7%	100.0%
After	Count	5	17	29	51
	% within After	9.8%	33.3%	56.9%	100.0%

$\chi^2 = 0.131, p = 0.479$

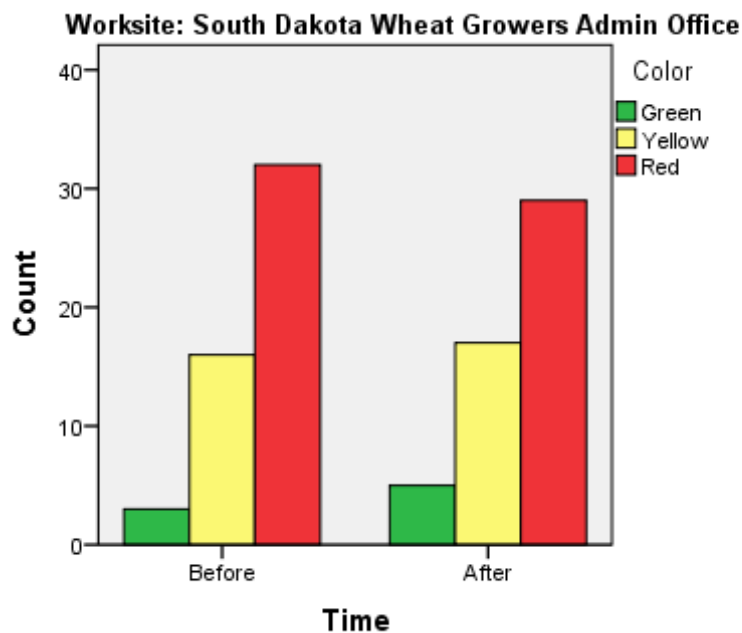


Figure 15. Bar chart of distribution of food items by Munch Code color, before and after implementation

Overall Analysis

Vending Machine(s) and Snack Bars, All Worksites:

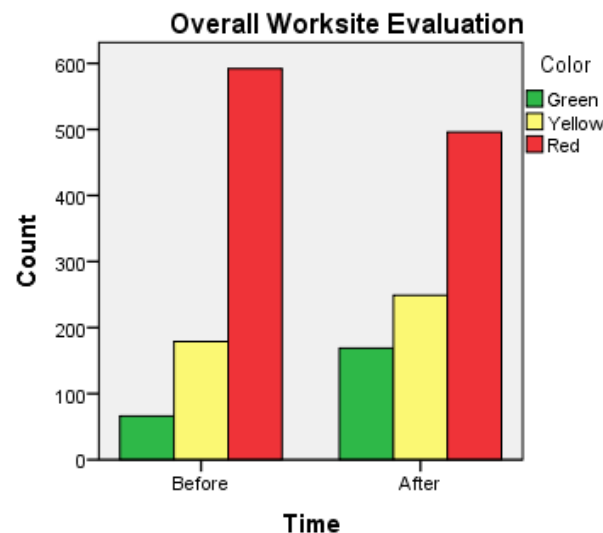
Table 17 shows the distribution of items of each Munch Code color category over all worksites before and after implementation; Figure 16 shows this distribution visually in a bar chart. The percentage of green items increased from 7.9% to 18.5%, while the percentage of red items decreased from 70.7% to 54.3%. **This shift was positive and highly statistically significant.**

Table 17. Distribution of food items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	66	179	592	837
	% within Before	7.9%	21.4%	70.7%	100.0%
After	Count	169	249	496	914
	% within After	18.5%	27.2%	54.3%	100.0%

$\chi^2 = 0.336, p < 0.001$

Figure 16. Bar chart of distribution of food items by Munch Code color, before and after implementation



Finally, Table 18 provides a summary across the 12 worksites, rather than the 837 “before” and 914 “after” items. Note that multiple locations within Avera Sacred Heart and Mount Marty College were combined to provide this table. As an example of how to interpret this table, across the 12 worksites, the average worksite had 7.8% green items before the project, and 20.4% green items after the project.

Table 18. Average % Green, Yellow, and Red Items Across 12 Worksites

Time	Munch Code Color		
	Green	Yellow	Red
Before	7.8%	20.4%	71.7%
After	20.4%	28.7%	50.9%

