

# Healthier Vending and Snack Bar Policy Project

## 2016-2017 Grantee Evaluation

### Executive Summary

#### Project Background

The primary objective of the Healthier Vending and Snack Bar Project is “to provide businesses with guidelines for incorporating healthier food and drink options in vending machines and snack bars at their workplaces<sup>1</sup>.” 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 healthy 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 indicates foods and drinks that are the healthiest options and can be enjoyed often; yellow indicates foods and drinks that have added sugar, fat, and calories and should be eaten occasionally; and red indicates foods and drinks that are the highest in sugar, fat, and calories and the least healthy, which should be eaten sparingly<sup>1</sup>.

#### Evaluation

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

- Final Progress Reports: Each of 17 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.
- Strategies to Increase Sales of Healthier Products: Eight questions were asked to the 17 worksites, each asking about specific changes and improvements the site may have implemented.
- Vending Machine and Snack Bar Analysis: The 17 worksites completed a vending machine and snack bar analysis to determine how the items offered are distributed across the Munch Code color categories.

#### Final Progress Reports

Of the 17 worksites, 12 (70.6%) have implemented a Healthier Vending and Snack Bar Policy. Of the remaining five worksites, some plan to implement a policy in the future, but others reported they would not due to lack of necessity or difficulties with large worksites. The most common challenges reported involved gaining the cooperation of vendors to ensure that healthier vending and snack bar options were available, as well as initially gaining the approval of employees. 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. All worksites generally commented that their future plans included continuing to follow through with the changes they had

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<sup>1</sup> South Dakota Healthy Vending and Snack Bar Policy Implementation Guide; retrieved from [http://goodandhealthysd.org/content/uploads/2014/09/ModelPolicy\\_HealthyVendingSnackBar\\_ImplementationGuide.pdf](http://goodandhealthysd.org/content/uploads/2014/09/ModelPolicy_HealthyVendingSnackBar_ImplementationGuide.pdf)

made, which indicates that the changes are sustainable. A number of worksites also commented that they would be introducing additional wellness-related programs to their employees, following the relative success of the Healthier Vending and Snack Bar Project.

#### Strategies to Increase Sales of Healthier Products

Areas that were very successful with respect to positive changes include changes related to point-of-sale information (all 17 worksites made these changes) and changes related to stickers and signs (all but one of the 17 worksites made these changes). Changes that were the least likely to occur included pricing changes (35.3%) and contractual changes with vendor (18.8%); these can both be related to relationships with vendors, and prices may not be under the control of the worksite. Many sites also reported making the following changes/improvements: product placement/attractiveness, administering a staff survey, and offering a taste test.

Additionally, 12 out of 17 sites made additional changes besides the ones listed on the survey. Those changes tended to be related to

- buying or devoting extra space or equipment (such as a refrigerator, purchased by the Belle Fourche Area Community Center) to make room for green items and to make them attractive; or
- providing incentives to employees to opt for healthier items, either directly or by reducing prices, or (at the Pennington County Sheriff's Office) providing educational material to employees about how healthy eating fits into their lifestyle and work schedules.

#### Vending Machine and Snack Bar Analysis

From the vending and snack bar analysis, all 15 sites that had vending or snack bars before the intervention made positive shifts toward greater percentages of green and yellow Munch Code items; six 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 Project, and as in year 3 shows unequivocally that these worksites are willing and able to make positive changes regarding the food choices they offer to their employees.

## Final Progress Reports

The final progress report focuses on four areas: outcomes (specifically challenges or barriers experienced), implementation of a Healthier Vending and Snack Bar Policy, future plans, and feedback.

### Outcomes/Challenges or Barriers

With respect to challenges and barriers encountered, it was common to report challenges related to vendors. Seven of the 17 worksites indicated that there were challenges regarding contacting vendors (both initially and for ongoing discussion), and that vendors were sometimes reluctant to stock green items because of the perception that they would not sell well and would not be good for their business. Note this was not true for all vendors, as two worksites specifically commented that their vendors were easy to work with when making changes to stocked items. Challenges related to vendors were also quite common in Year 3 as well.

Several worksites also reported that the staff were reluctant to move to a healthier vending system, due to preconceptions that a vending machine “is” junk food, or that their preferred options would not be available after the implementation. (Generally, the worksites continued to work with staff to help change these perceptions.) Another challenge experienced by multiple worksites related to difficulty coordinating among staff working on the project, whether it was making schedules work among those working on the project, turnover and poor communication among contact persons, or scheduling general meetings with staff who would be affected by the changes to provide information. Scheduling and communication was also a common challenge in Year 3.

Several other challenges experience by specific worksites are listed individually here:

- Difficulty getting items for vending (self-stocking) due to remote location
- Difficult to find a vendor due to remote location (solved by buying and stocking their own vending machine)
- Larger worksites having to choose physical areas to focus on
- Wasted food when overstocked produce went bad
- At Regional Health in particular, vending is used for fundraising, with the implication being that it is hard to provide incentives/keep prices low on healthy options

Most worksites indicated that these challenges (other than those related to vendors) were overcome with time and continued efforts.

### Implementation of Healthier Vending and Snack Bar Policy

Of the 17 worksites, 12 (70.6%) have officially implemented a Healthier Vending and Snack Bar Policy. The five worksites that have not yet implemented a policy included the following explanations:

- two worksites indicated that they plan to implement a policy, but had not yet completed all of the initial work needed to do so
- two worksites reported that they were too large and could not impact all vending locations or create a policy that worked with each unique location, and therefore cannot implement a broad policy
- one worksite indicated they did not feel a need for such a policy

This is somewhat different from the explanations in Year 3, where all but one worksite who had not implemented a policy indicated they planned to do so in the future.

### Future Plans

Among the worksites, it was very common to indicate that they would be continuing their current efforts; this included keeping or continuing to increase the percentage of green items, keeping Munch Code information available, continuing staff surveys or taste tests to provide new healthier options, etc. Several worksites that had not done so plan to implement an incentive program for employees to purchase more of the healthier options. This was very similar to programs from Year 3, indicating that the project was generally successful in introducing sustainable changes.

Multiple worksites also plan to introduce other wellness efforts after seeing the success of the Healthier Vending and Snack Bar Project. That includes introducing the Wellness Works Education Series, providing exercise options or cooking/nutrition classes, and even exploring these kinds of programs for remote workers. One worksite commented that implementing this project has made it clear that the employees had a need for wellness efforts that had not previously been fulfilled. These types of wellness programs were mentioned more often in Year 4 than they were in Year 3.

Some other individual plans are listed here:

- Examine a snack bar option at a worksite that does not currently have it
- Track consumption of green products to make future decisions about healthier vending
- Potentially purchasing a vending machine that can be stocked by the worksite
- Future vending machines in new facilities will be healthy vending machines
- Exploring similar worksites that no longer offer any sugar sweetened beverages
- Rotating food choices so that employees will remain interested in healthier choices
- Quarterly reviews of green food choices being offered

### Feedback

As in Year 3, for most worksites, the majority of feedback reported was quite positive. Several worksites commented about being impressed by the number of employees who were taking advantage of the healthier options available, and the rate at which healthier options were selling. Some reported that the healthier items are selling faster than the less healthy options in certain cases. In particular, the Belle Fourche Area Community Center reported that they were surprised by the number of kids who will choose healthier options when they are available, and students at SDSU have also commented very positively on having healthy options available on vending machines (and they are not always able to keep the machines stocked because the items are being bought frequently). Several worksites commented that the incentives and the taste tests were very helpful to bringing the employees on board with the project. Also useful was being able to keep prices down on the healthier items, when it was possible. In general, the comments supported the success of the program goal of increasing choice rather than restricting less healthy purchases.

Several worksites had vending or snack bar items available after the project and did not have it available before, and noted that employees were happy they had options available to eat in their work environment (and particularly healthy items). One of these worksites, which self-stocked their snack bar

items, was surprised by how quickly they were able to recover initial costs and make the snack bar part of their cash flow.

Spearfish Regional Hospital employees commented that it would be great to have these healthier options also available to patients and visitors, and not just for staff; they felt it would be welcomed and complement the healing environment.

Two specific testimonials that captured some of this feedback are below:

- “When I forget breakfast I appreciate having healthy snacks to purchase.”
- “I am more aware of what I am eating and it has been easier to lose weight with having healthy choices.”

Finally, there were two comments related to potential changes to the program. One worksite indicated that it was sometimes difficult to perform the calculations needed to determine an item’s nutritional value; it wasn’t always clear what category an item might fall into. They suggested implementing an app that could evaluate food while shopping to summarize nutritional value or even indicate the correct Munch Code color. The second comment was that the program does not reward giving up vending machines all together, which could also be a potentially healthy option, and it might be worth including some incentive for incorporating other healthier items into their diet as well.

## Strategies to Increase Sales of Healthier Products

Eight 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 Change/Improvement Questions

Did your worksite make the following changes/improvements to increase sales of healthier products?	Yes	No	%Yes
Product Placement/Attractiveness	13	4	76.5%
Pricing Changes	6	11	35.3%
Stickers or Signs	16	1	94.1%
Point of Purchase Information	17	0	100.0%
Conduct Staff Survey	10	7	58.8%
Conduct Taste Test	12	5	70.6%
Contractual Changes with Vendor	3	9	18.8%*
Additional Changes	12	5	70.6%

\* 4 worksites responded with "N/A," and one 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, changes with respect to providing point of purchase information, and to conduct taste tests. Slightly more than half of the sites conducted a staff survey. Sites were very unlikely to make pricing changes or make contractual changes with vendors.

Also from Table 1, 12 out of 17 sites implemented additional changes. Here are notes indicating the additional changes described by these sites:

- BankWest – Rapid City: “We changed our pre-existing shelves to something more open and pleasing to the eye and we expanded our snack bar to all three of our BankWest locations here in Rapid City.”
- Belle Fourche Area Community Center: “We purchased the fridge... I really like it and it draws a lot of attention. We have it filled solely with healthier green or yellow options. It stands out and I believe it has positively influenced our healthier options selling.”
- Black Hills Special Services Cooperative: “Purchase of shelving, baskets and refrigerator to store vending items.”
- Black Hills Works: “Implemented staff incentives for purchasing green options.”
- Falcon Plastics: “additional improvements made – additional new vending machine – can see nutrition information of each specific product right on the screen of the vending machine.”
- Fireball Industries: “A ‘lazy Susan’ display was purchased for product overflow and put in the lunchroom next to the refrigerator. Both are on the ‘honor’ system. A Rewards Program has been implemented with prizes given for green or yellow snack selections that have a green sticker on the back.”
- Lloyd Companies: “We adjusted the products in the machine to fit the demands of the customers while keeping products in the healthier category.”

- Pennington County Sheriff's Office: "We purchased refrigerators to offer more items such as string cheese, yogurt, and protein drinks at our facilities. In addition, we have begun to distribute educational materials to employees upon hire about healthy eating and how it pertains to their lifestyle and work schedules."
- Project Solutions: "The company allocated funds to continue to offer healthy food choices for employees to purchase at a reduced price to encourage the long-term choices employees are making."
- Regional Health: "Our snack vending machine provider is very motivated to increase our green options for snacks. They reached out to us to visit about new options and use the toolkit to verify what color group a snack item would fall into. I visited with one of the route guys for the Rapid City Market who states, 'Some of these green items are going a lot faster than I expected. Like the almonds and the wheat thins. The outlying buildings seem to move things a little better.' (than the main hospital.)"
- Spearfish Regional Hospital: "We are trialing a Healthy Vending machine in the Regional Health 10<sup>th</sup> St. Clinic. It provides healthier snack and drink choices for staff. The machine has some features that are well liked by staff including being able to look up nutrition information on the product before you purchase it, being able to use a credit card to purchase, and ability to contact the vendor and get issues resolved in a timely way. There is not a cafeteria on site at this location and feedback has been that they have liked the convenience of having the machine and access to healthy options."
- West River Business Service Center: "We decided to have more snacks in our healthy vending basket. We got a bigger shelf (basket). The healthy vending snacks are also more affordable than the vending machine."

## Vending Machine and Snack Bar Analysis for 17 Worksites

Each worksite reviewed the content of their vending machines or snack bars 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 17 sites, two of them (Black Hills Special Services and Fireball Industries) did not have vending machines/snack bars prior to the project, and are missing information related to changes in their Munch Code categories.



## ASI

**Vending Machine:**

Table 2 shows the distribution of items of each Munch Code color category at ASI before and after implementation; Figure 1 shows this distribution visually in a bar chart. The percentage of green items increased from 16.0% to 28%, while the percentage of red items decreased from 60.0% to 40%. **This shift was positive but was not statistically significant<sup>2</sup>.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	4	6	15	25
	% within Before	16.0%	24.0%	60.0%	100.0%
After	Count	7	8	10	25
	% within After	28.0%	32.0%	40.0%	100.0%

$\gamma = 0.338, p = 0.139$

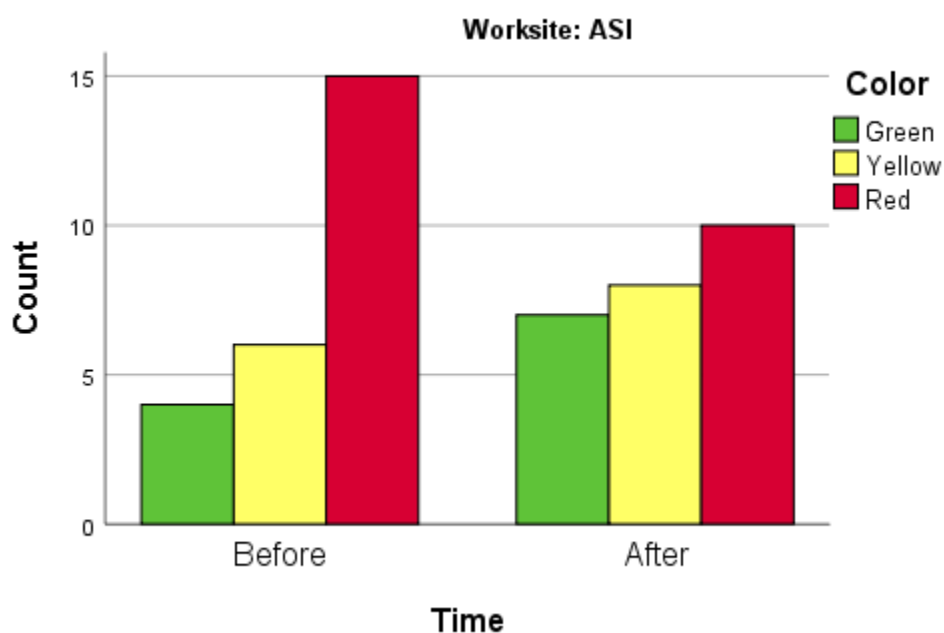


Figure 1. Bar chart of distribution of items by Munch Code color, before and after implementation

<sup>2</sup> 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.

## BankWest – Rapid City

**Snack Bar:**

Table 3 shows the distribution of items of each Munch Code color category at BankWest – Rapid City before and after implementation; Figure 2 shows this distribution visually in a bar chart. The percentage of green items increased from 26.9% to 52.6%, while the percentage of red items decreased from 51.9% to 26.3%. **This shift was positive and was statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	14	11	27	52
	% within Before	26.9%	21.2%	51.9%	100.0%
After	Count	20	8	10	38
	% within After	52.6%	21.1%	26.3%	100.0%

$\chi^2 = 0.459, p = 0.004$

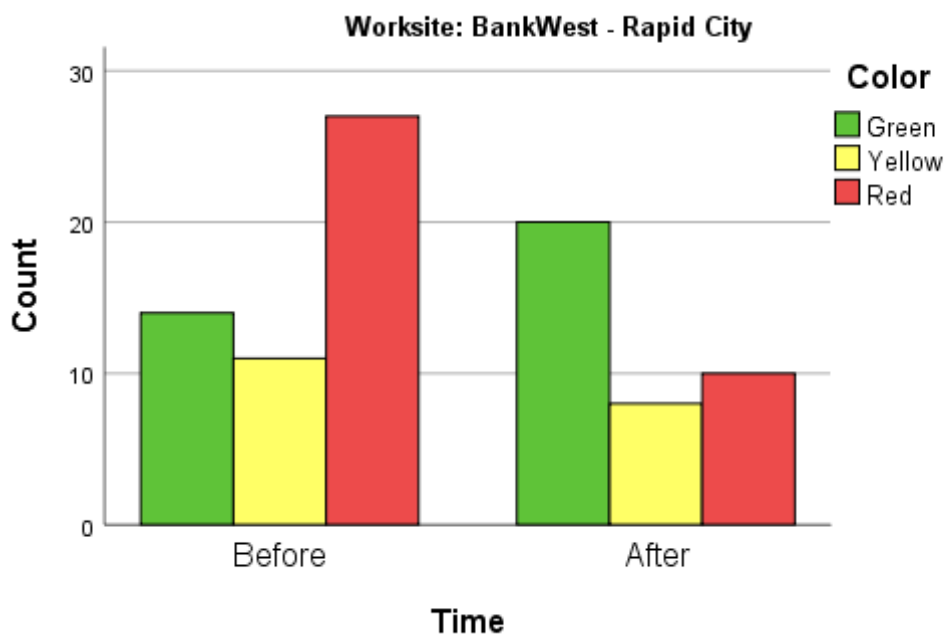


Figure 2. Bar chart of distribution of items by Munch Code color, before and after implementation

Belle Fourche Area Community Center

**Vending Machine and Snack Bar:**

Table 4 shows the distribution of items of each Munch Code color category at the Belle Fourche Area Community Center before and after implementation; Figure 3 shows this distribution visually in a bar chart. The percentage of green items increased from 5.8% to 18.9%, while the percentage of red items decreased from 71.2% to 60.4%. **This shift was positive and was statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	6	24	74	104
	% within Before	5.8%	23.1%	71.2%	100.0%
After	Count	20	22	64	106
	% within After	18.9%	20.8%	60.4%	100.0%

$\chi^2 = 0.272, p = 0.035$

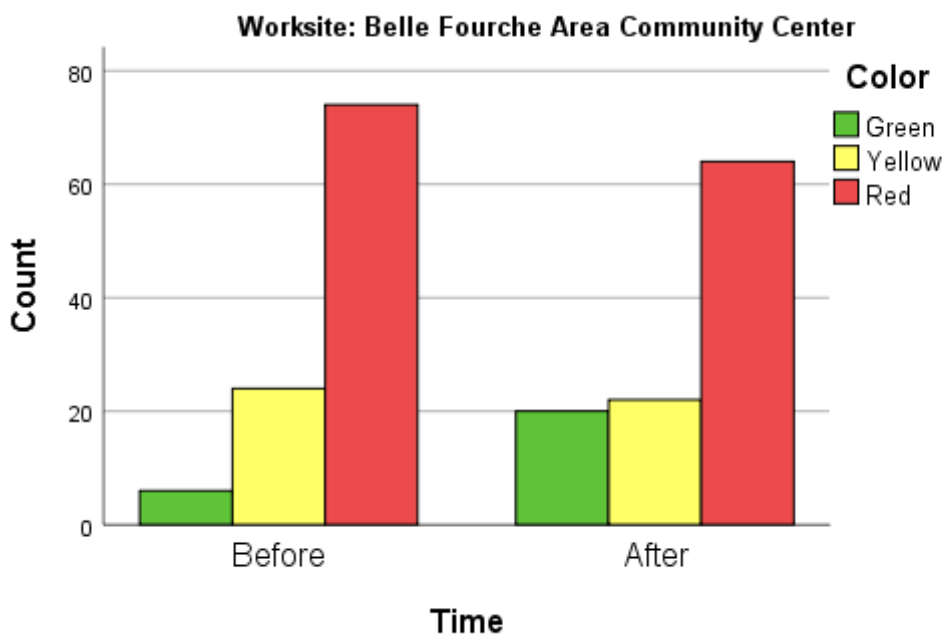


Figure 3. Bar chart of distribution of items by Munch Code color, before and after implementation

## Black Hills Special Services Cooperative

### Snack Bar:

Table 5 shows the distribution of items of each Munch Code color category at Black Hills Special Services Cooperative after implementation; Figure 4 shows this distribution visually in a bar chart. This snack bar was not present before the project began therefore before and after comparisons cannot be made.

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

Time		Color			Total
		Green	Yellow	Red	
After	Count	13	7	5	25
	% within After	52.0%	28.0%	20.0%	100.0%

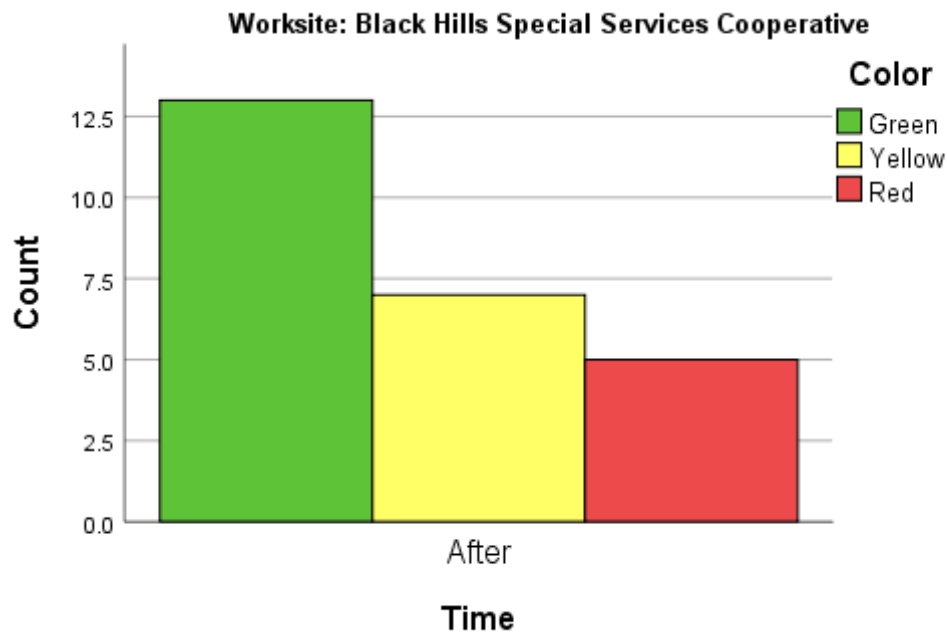


Figure 4. Bar chart of distribution of items by Munch Code color, after implementation

## Black Hills Works

### Vending Machine:

Table 6 shows the distribution of items of each Munch Code color category at Black Hills Works before and after implementation; Figure 5 shows this distribution visually in a bar chart. The percentage of green items increased from 0.0% to 2.9%, while the percentage of red items decreased from 97.1% to 71.4%. **This shift was positive and was statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	0	1	34	35
	% within Before	0.0%	2.9%	97.1%	100.0%
After	Count	1	9	25	35
	% within After	2.9%	25.7%	71.4%	100.0%

$\gamma = 0.863, p = 0.002$

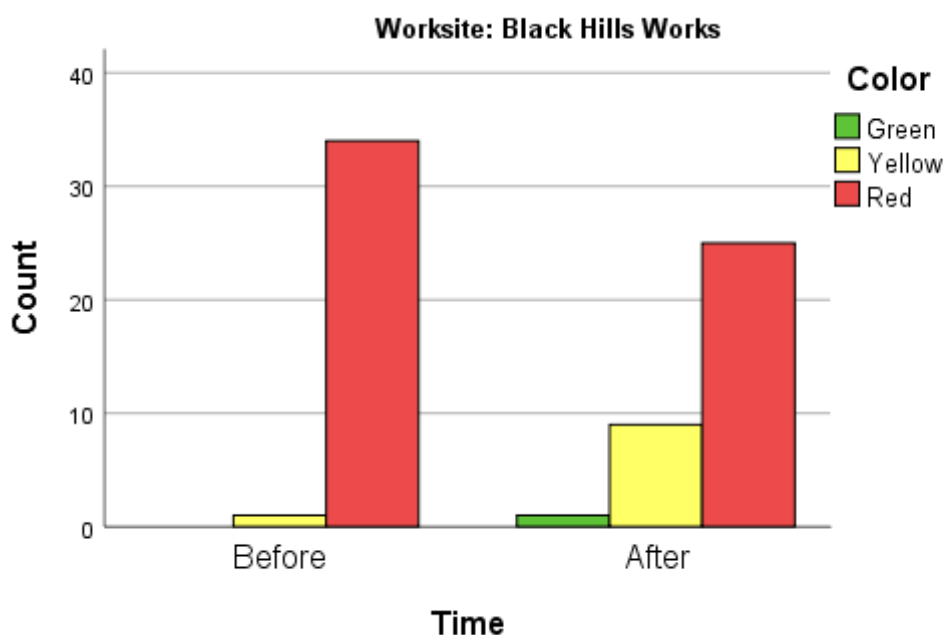


Figure 5. Bar chart of distribution of items by Munch Code color, before and after implementation

## Falcon Plastics

### Vending Machine:

Table 7 shows the distribution of items of each Munch Code color category at Falcon Plastics before and after implementation; Figure 6 shows this distribution visually in a bar chart. The percentage of green items increased from 6.2% to 16.1%, while the percentage of red items decreased from 67.9% to 62.9%.

**This shift was positive but was not statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	5	21	55	81
	% within Before	6.2%	25.9%	67.9%	100.0%
After	Count	20	26	78	124
	% within After	16.1%	21.0%	62.9%	100.0%

$\chi^2 = 0.155, p = 0.244$

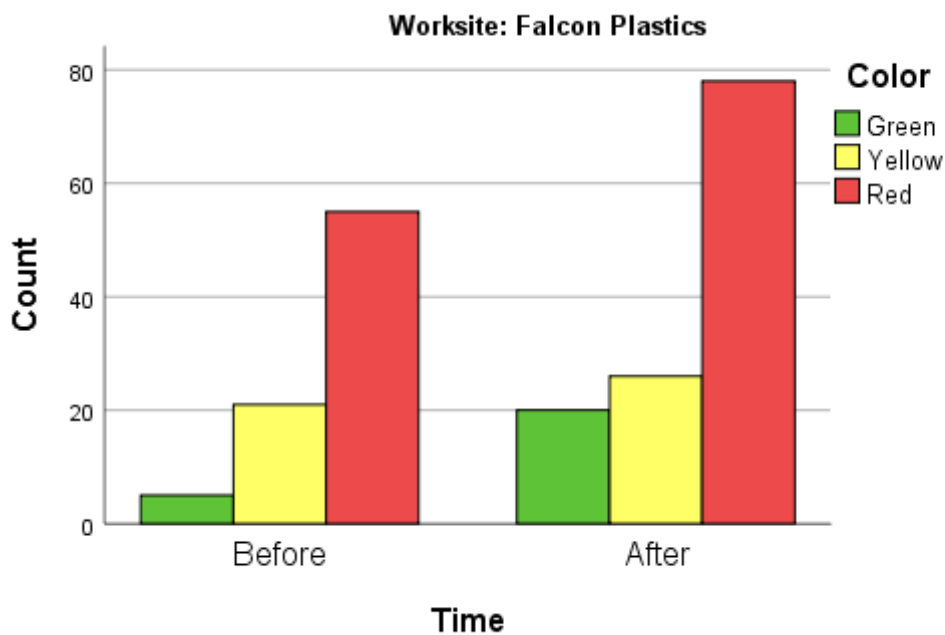


Figure 6. Bar chart of distribution of items by Munch Code color, before and after implementation

## Fireball Industries

### Vending Machine:

Table 8 shows the distribution of items of each Munch Code color category at Fireball Industries after implementation; Figure 7 shows this distribution visually in a bar chart. This vending machine was not present before the project began therefore before and after comparisons cannot be made.

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

Time		Color			Total
		Green	Yellow	Red	
After	Count	12	8	14	34
	% within After	35.3%	23.5%	41.2%	100.0%



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

## Lloyd Companies

### Vending Machine:

Table 9 shows the distribution of items of each Munch Code color category at Lloyd Companies before and after implementation; Figure 8 shows this distribution visually in a bar chart. The percentage of green items increased from 21.2% to 33.3%, while the percentage of red items decreased from 51.5% to 18.2%. **This shift was positive and was statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	7	9	17	33
	% within Before	21.2%	27.3%	51.5%	100.0%
After	Count	11	16	6	33
	% within After	33.3%	48.5%	18.2%	100.0%

$\chi^2 = 0.457, p = 0.011$

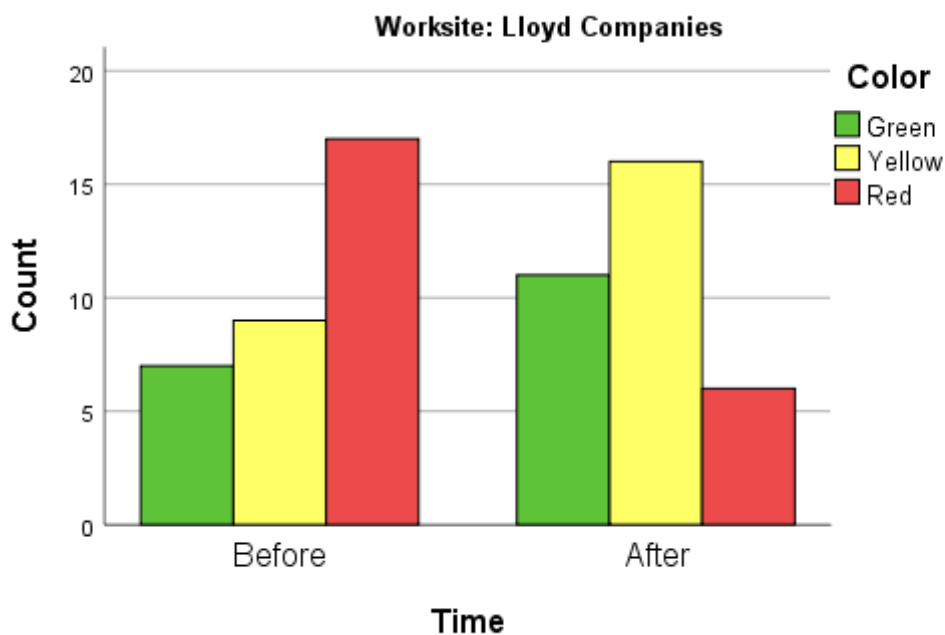


Figure 8. Bar chart of distribution of items by Munch Code color, before and after implementation



## North American Wholesale Florist

### Vending Machine:

Table 10 shows the distribution of items of each Munch Code color category at North American Wholesale Florist before and after implementation; Figure 9 shows this distribution visually in a bar chart. The percentage of green items increased from 0.0% to 3.6%, while the percentage of red items decreased from 76.0% to 69.6%. **This shift was positive but was not statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	0	12	38	50
	% within Before	0.0%	24.0%	76.0%	100.0%
After	Count	2	15	39	56
	% within After	3.6%	26.8%	69.6%	100.0%

$\chi^2 = 0.178, p = 0.402$

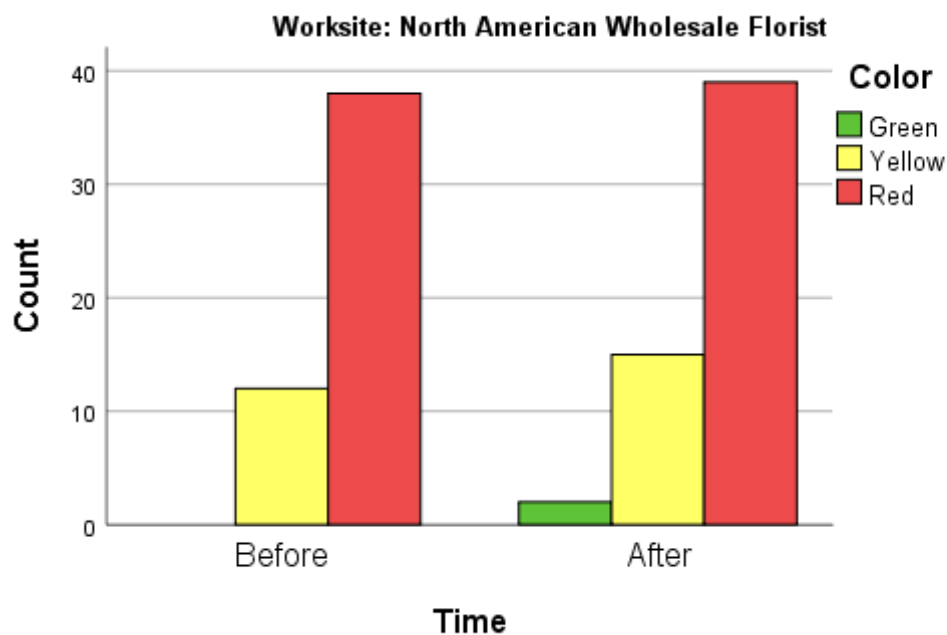


Figure 9. Bar chart of distribution of items by Munch Code color, before and after implementation

## Pennington County Sheriff's Office

### Vending Machines and Snack Bars:

Table 11 shows the distribution of items of each Munch Code color category at the Pennington County Sheriff's Office (across four locations) before and after implementation; Figure 10 shows this distribution visually in a bar chart. The percentage of green items increased from 2.4% to 27.8%, while the percentage of red items decreased from 78.0% to 48.1%. **This shift was positive and was statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	1	8	32	41
	% within Before	2.4%	19.5%	78.0%	100.0%
After	Count	15	13	26	54
	% within After	27.8%	24.1%	48.1%	100.0%

$\chi^2 = 0.609, p < 0.001$

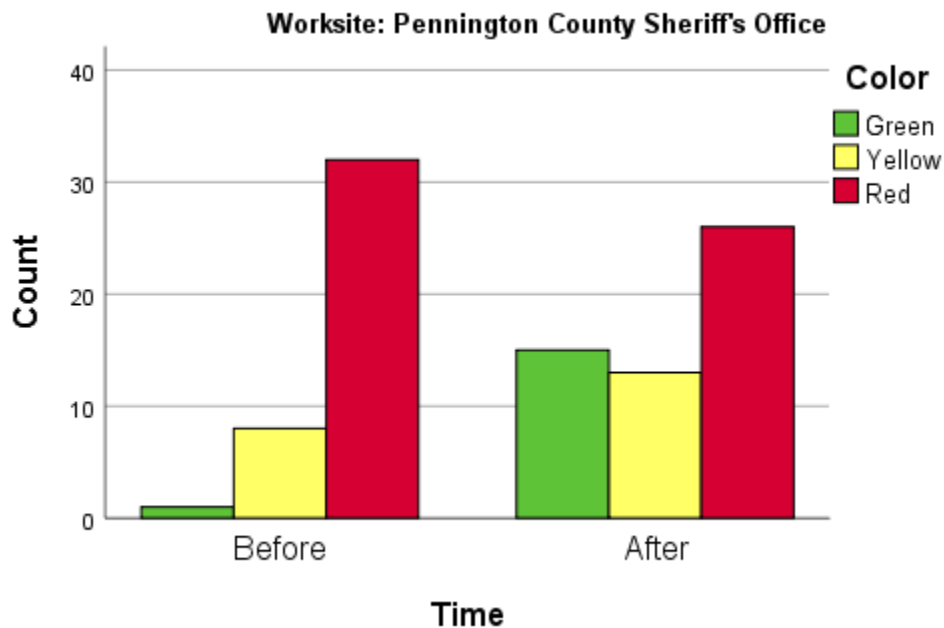


Figure 10. Bar chart of distribution of items by Munch Code color, before and after implementation

## Project Solutions

### **Snack Bar:**

Table 12 shows the distribution of items of each Munch Code color category at Project Solutions before and after implementation; Figure 11 shows this distribution visually in a bar chart. The percentage of green items increased from 38.5% to 53.8%, while the percentage of red items decreased from 23.1% to 15.4%. **This shift was positive but was not statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	5	5	3	13
	% within Before	38.5%	38.5%	23.1%	100.0%
After	Count	7	4	2	13
	% within After	53.8%	30.8%	15.4%	100.0%

$\chi^2 = 0.259, p = 0.421$



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

## Regional Health – Rapid City Market

### Vending Machines:

Table 13 shows the distribution of items of each Munch Code color category before and after implementation at Regional Health-Rapid City Market which includes cumulative analysis of all vending machines at twelve locations throughout Rapid City, not including the main hospital. Figure 12 shows this distribution visually in a bar chart. The percentage of green items increased from 1.3% to 12.8%, while the percentage of red items decreased from 69.1% to 61.7%. **This shift was positive but was not statistically significant.**

Table 13. Distribution of 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	19	38	92	149
	% within After	12.8%	25.5%	61.7%	100.0%

$\chi^2 = 0.218, p = 0.052$

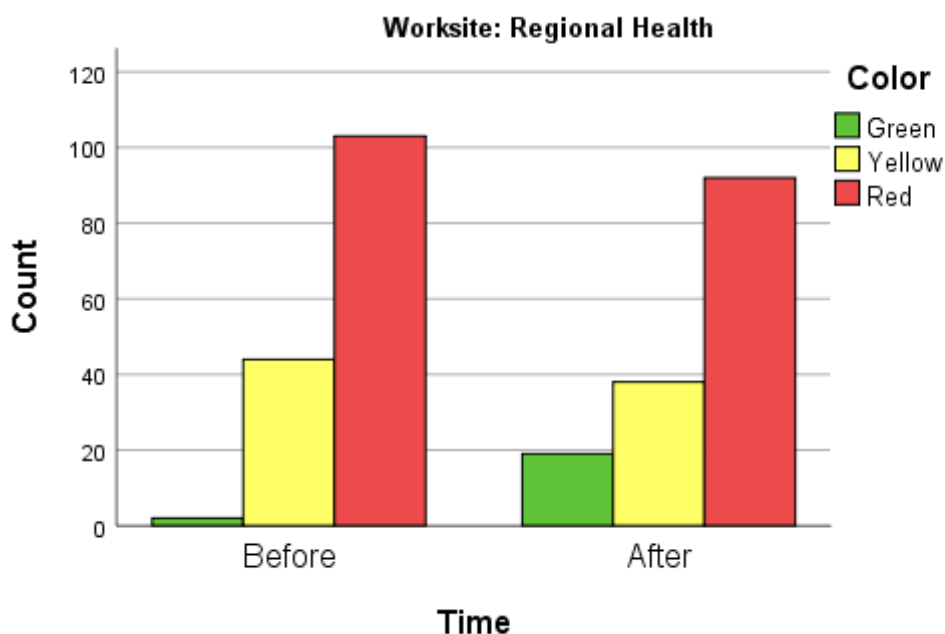


Figure 12. Bar chart of distribution of items by Munch Code color, before and after implementation

## SDSU

**Vending Machines:**

Table 14 shows the distribution of items of each Munch Code color category before and after implementation at SDSU which includes cumulative analysis of 150 vending machines throughout campus; Figure 13 shows this distribution visually in a bar chart. The percentage of green items increased from 8.1% to 10.5%, while the percentage of red items decreased from 82.3% to 77.8%. **This shift was positive and was statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	158	189	1609	1956
	% within Before	8.1%	9.7%	82.3%	100.0%
After	Count	245	273	1820	2338
	% within After	10.5%	11.7%	77.8%	100.0%

$\chi^2 = 0.132, p = <0.001$



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

## Spearfish Regional Hospital

**Vending Machines and Snack Bar:**

Table 15 shows the distribution of items of each Munch Code color category at the Spearfish Regional Hospital overall (combination of previous two subsections) before and after implementation; Figure 14 shows this distribution visually in a bar chart. The percentage of green items increased, from 23.9% to 33.8%, while the percentage of red items decreased, from 52.1% to 37.7%. **Overall, this shift was positive, but was not statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	17	17	37	71
	% within Before	23.9%	23.9%	52.1%	100.0%
After	Count	26	22	29	77
	% within After	33.8%	28.6%	37.7%	100.0%

$\chi^2 = 0.240, p = 0.072$

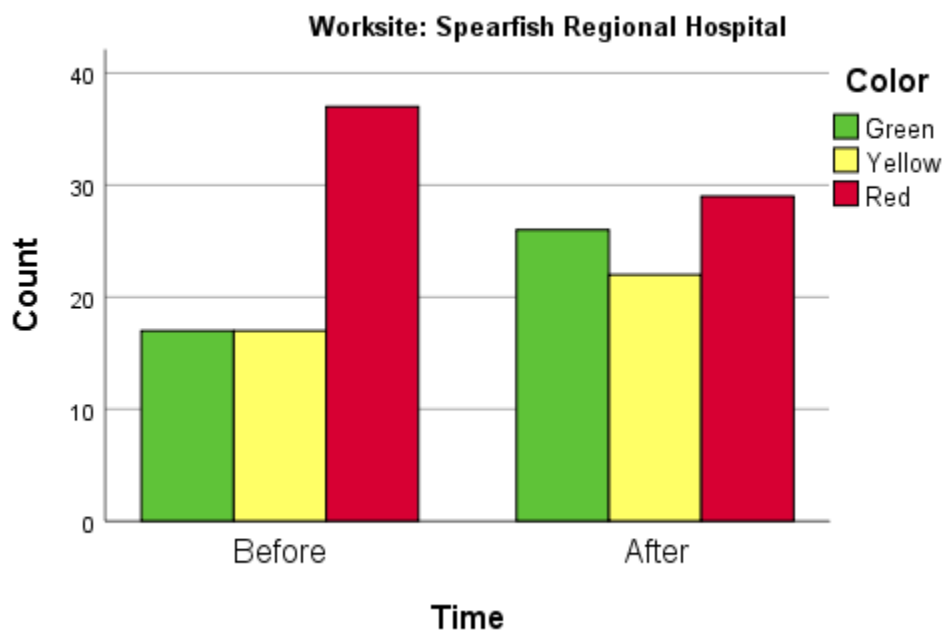


Figure 14. Bar chart of distribution of items by Munch Code color, before and after implementation

## The Hauge Group

### Vending Machine and Snack Bar:

Table 16 shows the distribution of items of each Munch Code color category at The Hauge Group before and after implementation; Figure 15 shows this distribution visually in a bar chart. The percentage of green items increased from 9.3% to 19.6%, while the percentage of red items decreased from 40.7% to 35.7%. **This shift was positive but was not statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	5	27	22	54
	% within Before	9.3%	50.0%	40.7%	100.0%
After	Count	11	25	20	56
	% within After	19.6%	44.6%	35.7%	100.0%

$\gamma = 0.175, p = 0.283$

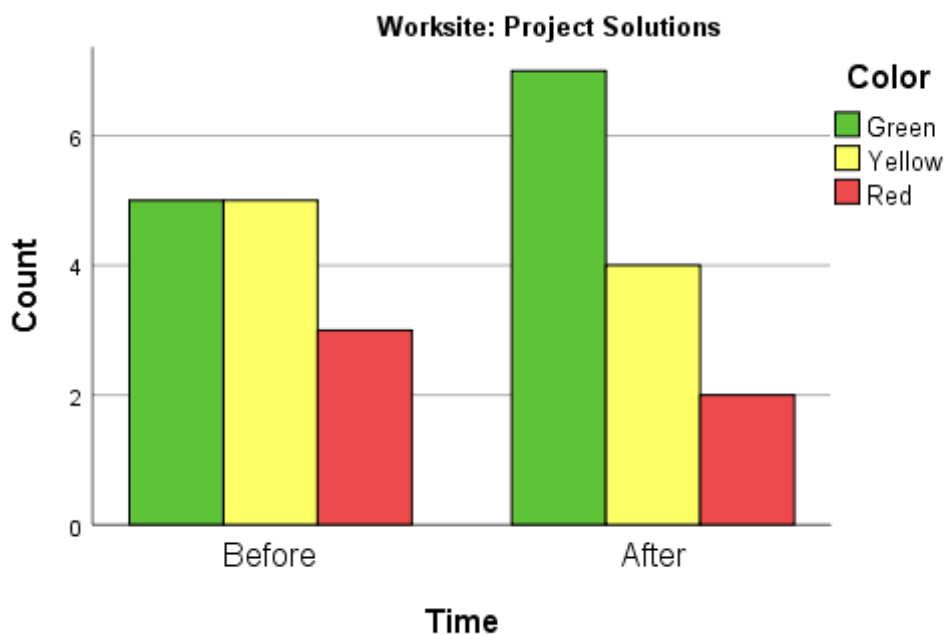


Figure 15. Bar chart of distribution of items by Munch Code color, before and after implementation

## West River Business Service Center

### Vending Machine and Snack Bar:

Table 17 shows the distribution of items of each Munch Code color category at the West River Business Service Center before and after implementation; Figure 16 shows this distribution visually in a bar chart. The percentage of green items increased from 7.7% to 12.9%, while the percentage of red items decreased from 63.5% to 56.5%. **This shift was positive but was not statistically significant.**

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

Time		Color			Total
		Green	Yellow	Red	
Before	Count	4	15	33	52
	% within Before	7.7%	28.8%	63.5%	100.0%
After	Count	8	19	35	62
	% within After	12.9%	30.6%	56.5%	100.0%

$\chi^2 = 0.154, p = 0.371$



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



Yankton Medical Clinic

**Vending Machine:**

Table 18 shows the distribution of items of each Munch Code color category at the Yankton Medical Clinic before and after implementation; Figure 17 shows this distribution visually in a bar chart. The percentage of green items increased from 5.0% to 17.5%, while the percentage of red items decreased from 57.5% to 47.5%. **This shift was positive but was not statistically significant.**

Table 18. Distribution of items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	2	15	23	40
	% within Before	5.0%	37.5%	57.5%	100.0%
After	Count	7	14	19	40
	% within After	17.5%	35.0%	47.5%	100.0%

$\chi^2 = 0.252, p = 0.195$

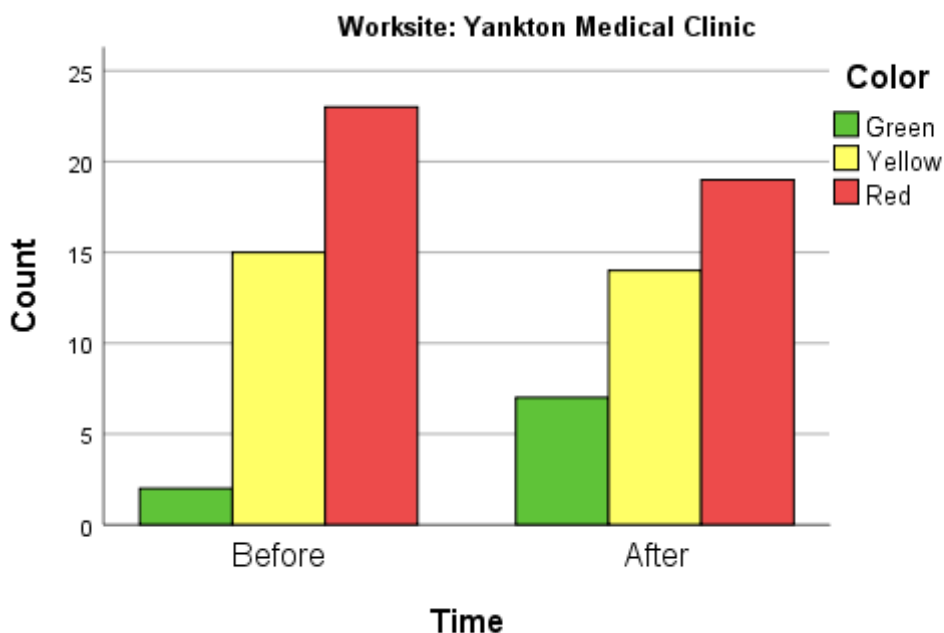


Figure 17. Bar chart of distribution of items by Munch Code color, before and after implementation

## Overall Analysis

### Vending Machines and Snack Bars, All Worksites:

Table 19 shows the distribution of items of each Munch Code color category over all worksites before and after implementation; Figure 18 shows this distribution visually in a bar chart. The percentage of green items increased from 8.3% to 13.6%, while the percentage of red items decreased from 77.0% to 70.3%. **This shift was positive and highly statistically significant.**

Table 19. Distribution of items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	230	404	2122	2756
	% within Before	8.3%	14.7%	77.0%	100.0%
After	Count	444	527	2294	3265
	% within After	13.6%	16.1%	70.3%	100.0%

$\chi^2 = 0.174, p < 0.001$



Figure 18. Bar chart of distribution of items by Munch Code color, before and after implementation

Finally, Table 20 provides a summary across the 17 worksites, rather than the 2756 “before” and 3265 “after” items (which are very dominated by items from SDSU). Note that when worksites had multiple locations, they were combined within that site to provide this table. As an example of how to interpret this table, across the 17 worksites, the average worksite had 11.5% green items before the project, and 25.4% green items after the project.

Table 20. Average % Green, Yellow, and Red Items Across 17 Worksites

Time	Munch Code Color		
	Green	Yellow	Red
Before	11.5%	25.7%	62.8%
After	25.4%	28.1%	46.5%

## Year 3 and 4 Combined Outcomes Summary

For the combination of years 3 (15 worksites) and 4 (17 worksites), 20 out of 32 (or 62.5%) have implemented a Healthier Vending and Snack Policy.

Table 21 shows an overall summary of the responses to the questions regarding changes and improvements to increase sales of healthier items for the combination of years 3 and 4.

Table 21. Summary of Responses to Change/Improvement Questions

Did your worksite make the following changes/improvements to increase sales of healthier products?	Yes	No	%Yes
Product Placement/Attractiveness	27	5	84.4%
Pricing Changes	22	10	31.3%
Stickers or Signs	30	2	93.8%
Point of Purchase Information	30	2	93.8%
Conduct Staff Survey	15	17	46.9%
Conduct Taste Test	21	11	65.6%
Contractual Changes with Vendor	8	15	25.8%*
Additional Changes	20	11	64.5%^

\*Eight worksites responded with "N/A," and one worksite did not respond to the question

^One worksite did not respond to the question

Table 22 shows the distribution of items of each Munch Code color category for all year 3 and 4 worksites combined, before and after implementation. Note that only 12 of the 15 year 3 worksites completed this analysis, for a total of 29 worksites. Figure 19 is a bar graph of these numbers. Overall, the percentage of green items has increased from 8.2% to 14.7%; the percentage of red items has decreased from 75.5% to 66.8%. **This is an overall positive change, and is statistically significant.**

Table 22. Distribution of items by Munch Code color, before and after implementation

Time		Color			Total
		Green	Yellow	Red	
Before	Count	296	583	2714	3593
	% within Before	8.2%	16.2%	75.5%	100.0%
After	Count	613	776	2790	4179
	% within After	14.7%	18.6%	66.8%	100.0%

$\chi^2 = 0.212, p < 0.001$



Figure 19. Bar chart of distribution of items by Munch Code color, before and after implementation

Finally, Table 23 provides a summary across the 29 worksites. As an example of how to interpret this table, across the 29 worksites, the average worksite had 9.9% green items before the project, and 23.3% green items after the project.

Table 23. Average % Green, Yellow, and Red Items Across 29 Worksites

Time	Munch Code Color		
	Green	Yellow	Red
Before	9.9%	23.4%	66.8%
After	23.3%	28.4%	48.3%