

August 2022

Effects of nutrient claims on consumer purchasing of snacks in white-collar and blue-collar working environments

Cecily R. Martinez

Compass Group USA, Cecily.Martinez@compass-usa.com

Amy M. Bardwell

Department of Family & Consumer Sciences Illinois State University, USA, ambardw@ilstu.edu

Julie R. Schumacher

Department of Family & Consumer Sciences Illinois State University, USA, jmraede@ilstu.edu

See next page for additional authors

Follow this and additional works at: <https://digitalcommons.usf.edu/jght>



Part of the [Business Administration, Management, and Operations Commons](#), [Food and Beverage Management Commons](#), [Marketing Commons](#), and the [Tourism and Travel Commons](#)

This Refereed Article is brought to you for free and open access by the M3 Center at the University of South Florida Sarasota-Manatee at Digital Commons @ University of South Florida. It has been accepted for inclusion in Journal of Global Hospitality and Tourism by an authorized editor of Digital Commons @ University of South Florida. For more information, please contact scholarcommons@usf.edu.

Recommended Citation

Martinez, C. R., Bardwell, A. M., Schumacher, J. R., & Barnes, J. L. (2022). Effects of nutrient claims on consumer purchasing of snacks in white-collar and blue-collar working environments. *Journal of Global Hospitality and Tourism*, 1(2), 159-174. <https://www.doi.org/10.5038/2771-5957.1.2.1012>

Corresponding Author

Amy Bardwell, Illinois State University, Assistant Professor, Campus Box 5060, Normal, IL, 61790

Revisions

Submission: Feb. 15, 2022; 1st Revision: May 24, 2022; 2nd Revision: June 2, 2022; Accepted: Jun. 09, 2022

Effects of nutrient claims on consumer purchasing of snacks in white-collar and blue-collar working environments

Authors

Cecily R. Martinez, Amy M. Bardwell, Julie R. Schumacher, and Jennifer L. Barnes

Effects of Nutrient Claims on Consumer Purchasing of Snacks in White-Collar and Blue-Collar Working Environments

Cecily R. Martinez¹, Amy M. Bardwell², Julie R. Schumacher³,
and Jennifer L. Barnes⁴

Compass Group USA

¹Cecily.Martinez@compass-usa.com

Department of Family & Consumer Sciences

Illinois State University, USA

²ambardw@ilstu.edu

³jmraede@ilstu.edu

⁴jlbarn2@ilstu.edu

Abstract

The objective of this study was to examine nutrient claims signage on the purchasing of snacks in corporate foodservice operations. The effectiveness of claims among foodservice operations serving primarily administrative roles (white-collar) were compared with those serving primarily manufacturing roles (blue-collar). An experimental study was conducted through the implementation of six nutrient claims evaluated by a group of registered dietitians. The snack items were conveniently placed near the cash register to “nudge” purchases, and sales of snacks before and after the implementation of claims were examined. Paired-samples *t*-tests indicated that after nutrient claims were implemented, sales of snacks increased in both groups. Blue-collar snack purchases increased by 79.8% after the six claims were implemented, and white-collar snack purchases increased by 33.2%. Results indicate that nutrient claims that had a significant impact on sales differed between the two groups.

Keywords: Nutrient claims, nutrition marketing, snacking behavior, institutional foodservice, nudge theory

Introduction

Obesity in working adults is a major health concern in the United States. More than 140 million people are employed and spend approximately a quarter of their lives at a worksite (Onufrak et al., 2018). The prevalence of overweight and obesity in adults has been exponentially increasing the last decade (Eriksen et al., 2015; Leung et al., 2018). In 2010, Onufrak et al. (2018) carried out a study observing the prevalence of obesity of working adults and its effect on the workforce. Results revealed that 28% of employed adults were obese, 20% had hypertension, and 5% had diabetes. The rise in obesity and obesity-related chronic diseases increased the number of people that had work disabilities (Onufrak et al., 2018).

The rise in health conditions in employed adults cost employers approximately \$93 billion dollars per year based on health insurance claims (Onufrak et al., 2018). Leung et al. (2018) found that unplanned eating was one of the most significant barriers to eating healthier in the workplace. The increase in obesity in adults, specifically working adults, has led to the observation that they will encounter other health concerns that are generally accompanied with obesity.

Providing healthful food items, such as snacks, can help fuel employees while also providing opportunities for health improvement, which could result in lowering employee health care costs. This study aims to identify how foodservice operations can increase sales of healthier snack options in corporate work settings through the use of nutrient claims. This study also seeks to examine nutrient claim's influence on consumer snack purchasing in the United States through the placement of snack carts.

Literature Review

Sedentary Workforce

According to one study, jobs have changed in the last 20 years from involving different forms of physical activity to becoming primarily sedentary for a high proportion of the working population (Chau et al., 2012). A substantial number of employed adults have occupations that require long durations of sitting times daily and spend about one-third to half of their day sitting down (Campbell et al., 2017; Chau et al., 2012). Specifically, 42% of men and 47% of women that participated in the study reported that they mostly sit at their job sites. Workers with sitting jobs had a significantly higher obesity risk than workers with mostly standing jobs (Chau et al., 2012). If obesity levels remain unchanged, the growing obesity-related health burden will have large economic consequences, including the cost to the health system as well as negative impacts on the workforce and a decrease in productivity (Chau et al., 2012).

Eating Behaviors of Employed Adults

The duration of sitting time in a work environment is not the only factor that increases an individual's likelihood to become overweight or obese. Garza et al. (2016) examined the association between working adults' eating behavior and the prevalence of obesity. Their results indicated that employed adults were more likely to participate in the impulsivity of food choices due to their value of immediate rewards and disregard of future costs (Garza et al., 2016). Furthermore, greater impulsivity was associated with more fast-food consumption and correlated with a higher body mass index (BMI) (Garza et al., 2016). Snacking, defined as food or drink consumed between meals, can account for up to 30% of daily caloric intake (Schuster et al., 2017). Convenience snack foods are typically associated with low nutrient density and high fat, sugar, and sodium content (Schuster et al., 2017). Providing easily identifiable, nutrient-dense snack options can help working adults make smarter snack choices.

Marketing Interventions for Food Sales and Nudge Theory

Studies suggest that convenience plays a significant role in food consumerism. The placement of foods in public places is done for financial gain, not for health considerations. One study observed how the presence of snack food at checkouts influences food purchasing. The results of the study revealed that out of the 29 stores visited, and twelve had a structured line style where a customer

would enter at one end and be steered through a line to the register (Basch et al., 2016). The twelve structured register lines were filled with candy, 33% had a refrigerator with soda, 17% had preserved meat, and one had an ice-cream freezer (Basch et al., 2016), thus indicating that access to snack foods can greatly enhance food choices. Additionally, most snack choices in register lines fall in the low nutrient, calorie-dense category (sodas, ice cream, candy, etc.).

Along these same lines, research shows that the placement of items can guide one's decision through the design of the environment also known as the Nudge Theory (Thaler & Sunstein, 2008). The successfulness of product placement in such a way that encourages choice is evident in studies like Basch et al. (2016). Using this same theory, packaging and placing healthy snack options in convenient locations, like checkout lines, can influence the choice made by consumers without infringing on their freedom of choice. Arno and Thomas (2016) conducted a meta-analysis of over 40 articles that used nudge theory strategies to influence healthy dietary choices. The authors determined that nudge strategies do have a positive influence on healthy snack choices. This is an opportunity to evaluate whether making healthier options more accessible near checkout stations can influence food consumption for the better.

In addition to the placement of products, there also seems to be an increase in health awareness and demand for healthier snack options by consumers. According to Payne et al. (2014), there has been over \$200 million in annual sales of smaller snack package sizes of 100-calories in the United States. This movement is intended to help consumers identify appropriate portion sizes and limit calorie consumption. Not only is consumers' awareness of the relative health of snacks increasing, but also the exact number of calories (Payne et al., 2014). The change in snack demands could indicate that consumers have a desire to make a change to their lifestyle. According to a long-term study by Pearson et al. (2017), changing snack behavior can have an impact on diet quality and long-term health. Eating healthier snacks could reduce the instances of obesity and also have a positive effect on the overall health of an individual.

Role of Nutrient Claims

Studies have indicated that nutrient claims have been a major contributor to the purchasing process, as well as helping customers make healthier food choices (Kaur et al., 2017; Talati et al., 2016). Kaur et al. (2017) found that nutrient claims generally increase purchasing/consumption and concluded that health-related claims have a substantial effect on dietary choices. The data revealed that nutrient claims on the front of package labels can potentially lead to more positive evaluations of products compared to no front packaging labels (Talati et al., 2016). These findings demonstrate how persuasive claims and marketing can be to the average consumer, specifically, the average working adult in the United States.

A cross-sectional study evaluated the proportions of food carrying claims and the types and prevalence of nutrient claims in the food supply (Franco-Arellano et al., 2017). Overall, 49% of products displayed any type of nutrient claims. Out of those products, the majority that had a claim were meal replacement items. Interestingly, general health claims, specifically front-of-pack claims, were carried on 20% of foods compared to 18.9% three years prior (Franco-Arellano et al., 2017). Almost half of the products in the food supply have nutrient claims and front-of-package claims being used indicating a marketing strategy to increase sales that can also have a positive health outcome.

Although nutrient claims are more abundant in the food supply than ever before, it raises the question of whether one nutrient claim is more effective than another in purchasing. A study conducted to evaluate how consumers interpret nutrient claims found that a consumer's ability to process nutrient claims is influenced by whether the substance or nutrient is recognizable to them as important to their health (Hodgkins et al., 2019). This suggests that if a claim refers to an unfamiliar nutrient to the consumer, it will be less effective in informing the food product's benefit. This could be due to disparities in education and in nutrition knowledge. Therefore, blue-collar positions, characterized as hourly paid work with low education requirements (Lips-Wiersma et al., 2016) may be less concerned with health claims than those working in white-collar positions which are characterized as administrative salary positions requiring higher levels of education.

H1: There will be a larger increase in sales of snacks with nutrient claims in white-collar settings compared to blue-collar settings.

A research experiment was performed to evaluate whether nutrient claims influenced a person's perception and portion size. Participants of the study completed a survey on perceived healthiness, tastiness, how filling a product was, and the portion size they consumed. Of the 1,039 participants, it was found that the tastiness and healthiness of the foods were the same regardless of a nutrient claim (Benson et al., 2018). However, some foods were perceived as more filling than others without a claim (Benson et al., 2018), suggesting that nutrient claims could help aid in portion sizing. If a food item is perceived as more filling due to a nutrient claim, then it would be less likely overconsumed. Benson et al. (2018) state that psychological factors, such as belief in a claim, were the most consistent predictors of perception and portion size selection. Based on these previous studies, nutrient claims influence not only purchasing but also consumption.

H2: There will be an increase in sales of snacks with nutrient claims compared to snacks without claims.

Literature has identified how the prevalence of obesity is increasing in employed adults and how influential nutrient claims can be on food purchasing and consumption. However, past literature does not explain how effective nutrient claims are on snack perceptions and their effects on consumer purchases in work environments. The effects of nutrient claims have not been explored specifically with snacks in a corporate environment.

Purpose of Study

The purpose of this experimental study was to evaluate how nutrient claims on snacks influenced consumer food purchasing by corporate employees at four corporate accounts. The objective was to determine if nutrient claims altered working adults' purchases of snacks in a corporate work setting. It was hypothesized that there would be an increase in sales of snacks with nutrient claims compared to snacks without claims and that there would be a larger increase in sales of snacks with nutrient claims in white-collar settings compared to blue-collar settings.

Methods

Sample

In this study, four large corporate operations in the Midwest United States with foodservice available onsite, specifically prepackaged snacks, were included. In total, two white-collar and two blue-collar locations agreed to participate in the implementation and evaluation of sales of snacks with and without nutrient claims. White-collar is defined as a person who performs professional, managerial, or administrative work in an office or other administrative environment (Lips-Wiersma et al., 2016). Blue-collar is defined as a person who performs skilled or unskilled physical labor in a manufacturing or factory setting (Lips-Wiersma et al., 2016). The choice to include both administrative workers (white-collar) and manufacturing/factory workers (blue-collar) was to ensure a range of backgrounds and work environments. The two white-collar operations made up a combined total of 4,600 employees. The two blue-collar operations had 4,298 employees total. There was a total of 8,898 employees that had the possibility of purchasing food in the corporate cafes. Over the course of data collection, 2,398 purchases of the chosen snacks were recorded.

Data Collection

To assess the effects that nutrient claims had on consumer snack purchases in a working environment, four corporate foodservice operations were recruited: two white-collar and two-blue-collar. By agreeing to participate in this study, corporate locations granted access to their point of sales 30 days prior to and 30 days after the implementation of the nutrient claims on snacks sold at their operation. This time frame allowed thorough evaluation of snacks purchased with nutrient claims compared to snacks without nutrient claims throughout the duration of the 60 days of the study. Additionally, the managers of the corporate operations agreed to be trained on how to implement the nutrient claims efficiently for the duration of the study.

Nutrient Claim Application

To assess the impact nutrient claims have on snack purchases in a working environment, the criteria for each nutrient claim was determined by a group of five corporate registered dietitians. The backgrounds of the registered dietitians allowed for careful evaluation of the nutrients and accurate labeling of the claims. Next, the registered dietitians chose snacks that fit the criteria of the six claims from the list of food items that the corporate foodservice operations offer to their employees. The registered dietitians determined if a snack fit into a nutrient claim's criteria by carefully examining the nutrition labels.

Additionally, the corporate registered dietitians and marketing professionals collaborated to create a retail snack mobile cart that was implemented at each corporate location. The mobile cart consisted of 6 total shelves: three shelves on the front of the cart and three shelves on the back of the cart (Figure 1). A magnetic strip that labels a nutrient claim was placed on each shelf to highlight the category of snacks displayed on that shelf. The mobile carts were placed in the same area of other snacks that did not fit the nutrient claim criteria near the register. The snacks with and without claims were available to customers at the same time. However, the snacks with claims were on a separate cart.

Figure 1. Display of Snack Mobile Cart



Nutrient Claim Categorization

The group of registered dietitians identified six nutrient claims to be used in this study, including: “replenish,” “energy,” “mindful,” “fit,” “avoiding gluten,” and “superfood.” The criterion for “replenish” specified that food items must have a minimum of 8 grams of protein per serving. “Energy” criteria stated that the food item must have at least 5 grams of protein and 3 grams of fiber per serving. Criteria for the “mindful” claim specified that food items must have no more than 250 calories per serving and the company that manufactured this snack has contributed sustainable efforts to protect the environment and society. This was determined by conducting research on each company included in the snack list to determine if they have participated in any programs or work that promotes sustainability. The criteria for “fit” included food items that had no more than 250 calories, no more than 10 grams of fat, no more than 3 grams of saturated fat, 0 grams of trans fat, and no more than 230 milligrams of sodium per serving. Snacks with the “avoiding gluten” nutrition claim must have been labeled as gluten-free by the manufacturers. Finally, “superfood” nutrient-claim food items must have a fruit, vegetable, whole grain, nut, or a legume listed as the first or second ingredient within the ingredient list.

Retail Snack Intervention

The types of snacks offered at each corporate location varied, including chips, granola bars, crackers, cookies, and candy. Although corporate locations participating in the study did not sell all the same snacks in their cafes, each location did have three snacks for each nutrient claim category totaling 18 snacks evaluated in this study.

The sales of snack items chosen for this study were evaluated 30 days before and 30 days after the implementation of the nutrient claims at the four corporate operations. The snacks with the nutrient claims were placed on the retail snack mobile cart as a separate display in the corporate foodservice operations near the cash registers. Snacks were available for purchase during all hours that each individual foodservice operation was in service. After the finalization of the snacks and nutrient claims, participating foodservice managers were notified about the list of snacks that they must have in stock in their foodservice operation throughout the duration of the study. Additionally, standard operating procedures were provided for the placement of the snacks within the correct nutrient claim.

Measures

To evaluate the nutrient claims and the sales of snacks, a point-of-sales system was used at each corporate location to record the purchases of snacks in the foodservice operations before and after the implementation of the nutrient claims. After the sales data was collected at each location, the purchases of the chosen snacks were evaluated. This data allowed the researchers to compare purchases of the chosen snacks before and after the implementation of the nutrient claims. The data also allowed the researchers to examine if nutrient claims have more of an impact in one working environment over another (white-collar versus blue-collar).

Statistical Analysis

Descriptive statistics were computed to characterize the sample. The percentage change formula was used to evaluate changes in values of the variables over a period of time. The percentage change equals the change in the value divided by the absolute value of the original value, and then this was multiplied by 100 $[(\text{new value} - \text{original value}) / \text{original value}] \times 100$. Additionally, paired samples t-tests were conducted to compare pre- and post-intervention sales.

Results

Total Recorded Purchases

A total of 8,898 people had the opportunity to purchase the chosen snacks during the 60-day period of the study. A total of 2,398 purchases were recorded among all operations during the 60-day period. Out of those purchases, 1,385 (57%) were from the two white-collar operations, and 1,013 (42%) were from the two blue-collar operations.

Prior to the implementation of the mobile cart, the white-collar operations had 594 purchases of the 18 chosen snacks utilized for this study. The white-collar sales of the same snacks increased to 791 purchases after 30 days with the intervention of the nutrient claims. The blue-collar operations

recorded 362 purchases of the chosen snacks before the nutrient claim intervention and the sales increased to 651 purchased after the claims were implemented (Table 1).

Table 1. Snack Purchases in White-Collar and Blue-Collar Operations

	White-Collar Operations		Blue-Collar Operations		Combined	
	Without Claims	With Claims	Without Claims	With Claims	Without Claims	With Claims
Replenish	172	184	39	90	211	274
Energy	221	239	153	246	374	485
Mindful	30	95	55	76	85	171
Fit	93	123	14	54	107	177
Avoiding Gluten	31	62	29	46	60	108
Superfood	47	88	72	139	119	227
Total	594	791	362	651	956	1442

Overall, the total purchases increased after the nutrient claims were implemented. Before the intervention, the point of sales system recorded a total of 956 purchases of the 18 snacks being evaluated for this study. After the intervention, the point of sales system recorded a total of 1,442 purchases of the same snacks. The percentage increase of the total purchases of these snacks was 50.8% (Figure 2). A paired samples t-test was conducted to evaluate whether there was a significant increase in sales of snacks after the implementation of the nutrient claims. The results indicated that the overall mean of snacks after implementing the nutrient claims ($M = 19.94$, $SD = 24.1818$) was statistically significantly greater than the sales of snacks before the nutrient claims were implemented ($M = 13.28$, $SD = 23.85$), $t(71) = 4.87$, $p \leq .01$.

Additional examination found that there was a statistically significant increase in the sales of snacks between pre-intervention ($M = 21.78$, $SD = 28.35$) and post-intervention ($M = 16.50$, $SD = 30.62$) for the white-collar operations ($t(35) = 5.28$, $p \leq .01$). The blue-collar pre- and post-intervention paired samples t-test had comparable results, with a statistically significant increase in sales after the nutrient claims were implemented ($M = 18.11$, $SD = 19.38$) compared to before ($M = 10.06$, $SD = 13.95$), $t(35) = 4.08$, $p \leq .01$.

A one-way analysis of variance was conducted to evaluate the relationship between blue-collar and white-collar snack sales. The one-way ANOVA found that there was not a statistically significant difference between the blue-collar and white-collar pre-intervention sales ($F(1, 70) = 1.321$, $p = 0.254$), post-intervention sales ($F(1, 70) = 0.410$, $p = 0.524$), nor was there a statistically significant difference between their overall sales ($F(1, 70) = p = 0.361$).

Percentage change of the total white-collar purchases before and after the intervention increased 33.2%, and blue-collar purchases increased by 79.8%, suggesting that after the implementation of

the nutrient claims, there were 46.6% more sales of the specific snack items in the blue-collar operations compared to the white-collar (Figure 3 and Figure 4).

Figure 2. Percentage Change of Overall Snack Purchases

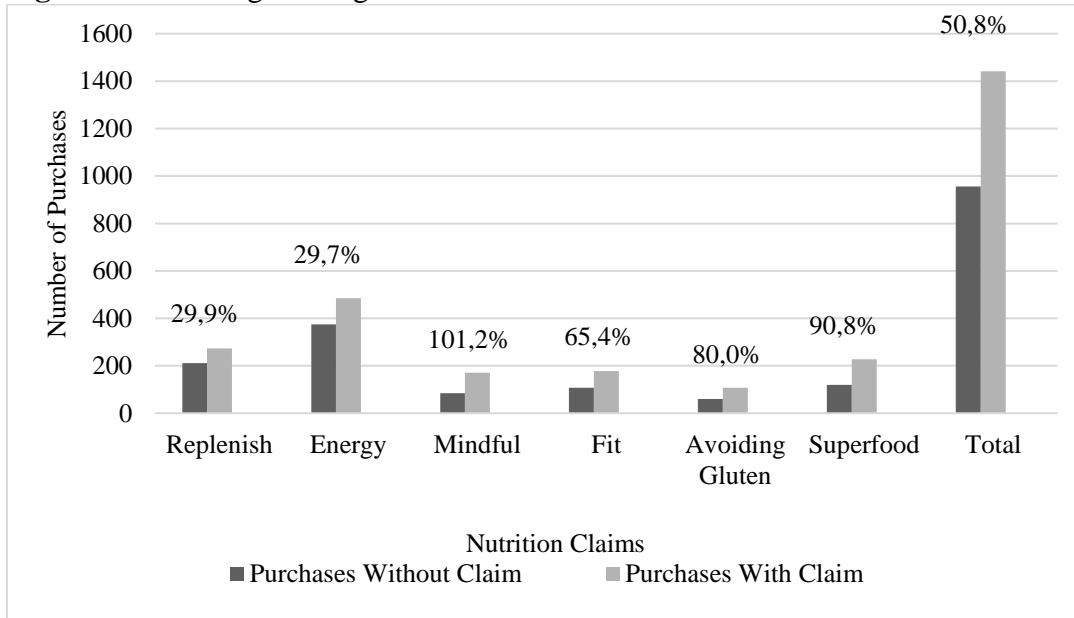


Figure 3. Percent Change of White-Collar Snack Purchases

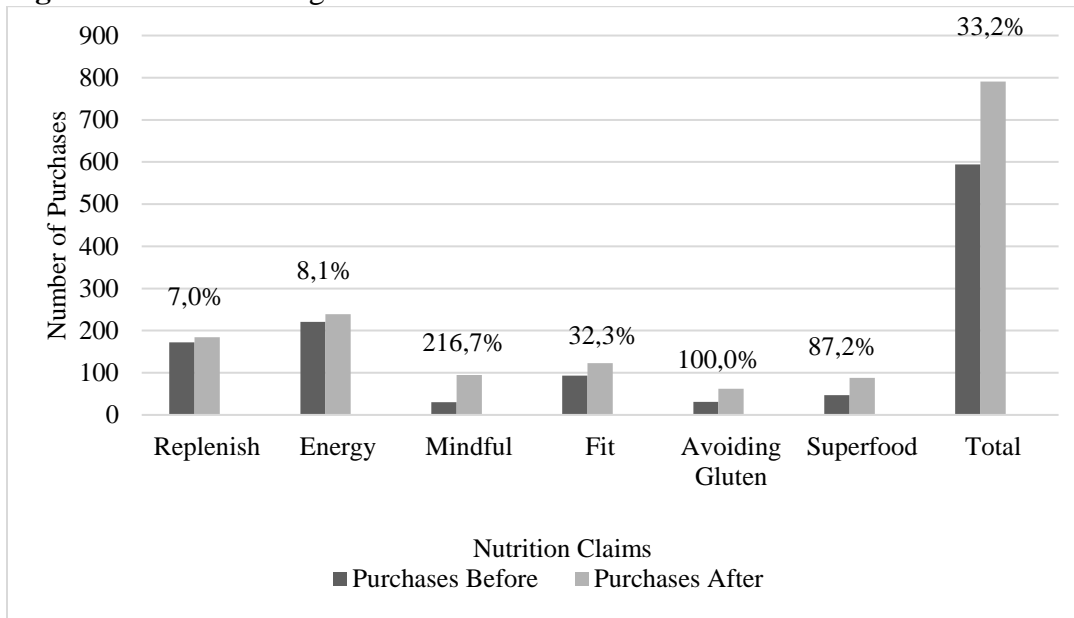
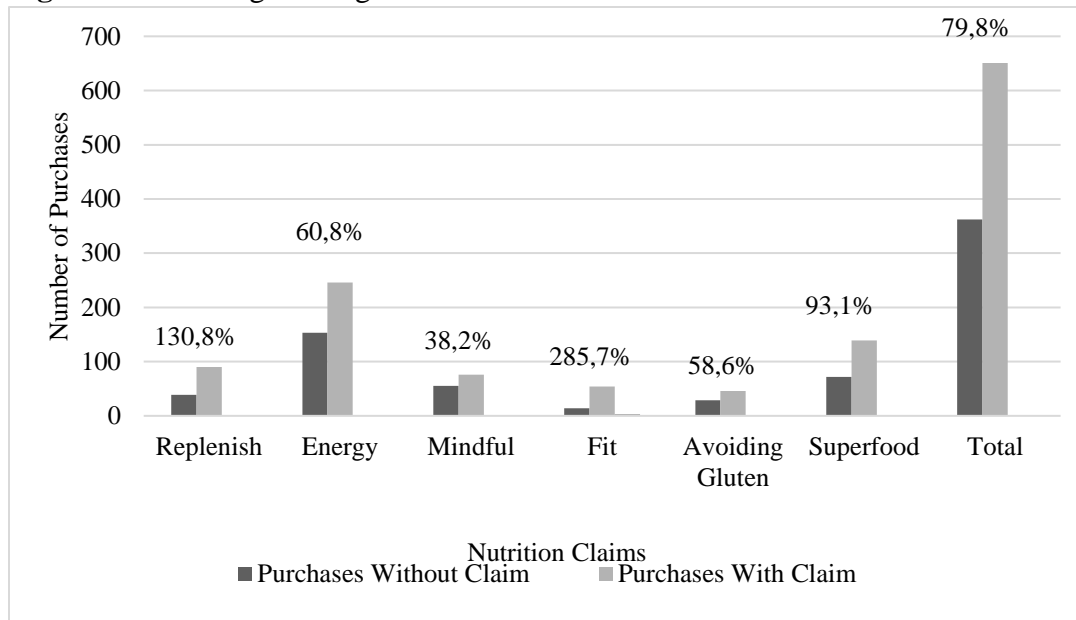


Figure 4. Percentage Change of Blue-Collar Snack Purchases



Based on the results of the paired-samples t-tests and the one-way ANOVA, there is evidence suggesting there was a statistically significant increase in sales of snacks with nutrient claims intervention overall, providing support for the second hypothesis: “There will be an increase in sales of snacks with nutrient claims compared to snacks without claims.” However, hypothesis one was not supported as there was not a statistically significant difference between the sales of snacks among the groups: “There will be a larger increase in sales of snacks with nutrient claims in white-collar settings compared to blue-collar settings.

Nutrient Claim Purchases

The statistically significant increase in sales of snacks included in the intervention was further broken down by specific nutrient claims. The researchers compared pre- and post-intervention sales using paired-samples t-tests to look for significant differences between the means. It was found that there was a statistically significant increase in the overall sales of snack items with the nutrient claims “energy” ($t(11) = 2.336, p \leq 0.05$), “mindful” ($t(11) = 2.894, p \leq 0.05$), and “super food” ($t(11) = 2.246, p \leq 0.05$), but not “replenish”, “fit”, or “avoiding gluten” (Table 2).

Table 2. Paired-samples t-test results comparing pre- and post-intervention sales of nutritional snacks based on nutrient claims categories.

	Sales Before Intervention		Sales After Intervention		<i>df</i>	<i>t</i>
	M	SD	M	SD		
Replenish	17.583	19.979	22.833	17.801	11	1.457
Energy	31.167	46.399	39.833	44.171	11	2.336*
Mindful	7.083	5.054	14.250	10.154	11	2.894*
Fit	8.917	16.451	14.750	15.034	11	1.409
Avoiding Gluten	5.000	4.843	9.000	6.994	11	1.915
Super Food	9.917	16.714	19.000	22.165	11	2.246*
Overall	13.278	23.845	19.944	24.182	71	4.87**

* $p \leq .05$. ** $p \leq .01$

“Energy”. When evaluating the data of the total purchases of each claim, it was found that the “energy” nutrient claim had the least percentage change of purchases than any other claim in the combined sales of the blue- and white-collar operations increasing from 374 to 485 purchases with a percentage change of 29.7% (Figure 2). However, the paired-samples t-test indicates that though the increase in sales was smaller than that of others, it was overall statistically significant. Further exploration into the label “energy” found that the increase in sales at the blue-collar operations was approaching statistical significance ($t(5) = 2.526$, $p = .053$), whereas the white-collar operations were not ($t(5) = 0.892$, $p = .413$).

“Mindful”. The combined sales of the white-collar and blue-collar operations for the “mindful” nutrient claim had the largest percentage increase than the other five claims (Table 1). The percentage change of the total purchases of the snacks in this nutrient claim category was calculated to be a 101.2% increase (Figure 2) with a statistically significant increase between the pre- and post-intervention sales. Comparing the white-collar and blue-collar operations sales, the data suggested that the “mindful” nutrient claim may have had the largest influence in the white-collar operations compared to the blue-collar operations. Before the intervention, the “mindful” snacks were recorded as having 30 purchases before and 95 purchases after the intervention at the white-collar operations (Table 1) resulting in a 216.7% increase (Figure 3). The blue-collar operations were not as influenced as the white-collar operations with the “mindful” claim with 55 purchases before the intervention and 76 purchases after, an increase of 38.2% (Figure 4). Further analysis revealed that the white-collar operations had a statistically significant increase in the sales of snacks with the “mindful” claim ($t(5) = 3.017$, $p \leq .05$), whereas the blue-collar operations did not ($t(5) = 1.185$, $p = 0.289$).

“Superfood”. The “superfood” nutrient claim was relatively similar in both white-collar and blue-collar operations. However, the “superfood” nutrient claim had the second greatest impact on total purchases when the sales of both working environments were combined. Before the intervention

of the “superfood” claim, the purchases of the snacks in this category were recorded as 119 sales before and 227 sales after the intervention (Table 1), with a 90.8% increase (Figure 2). Additionally, the paired-samples *t*-test indicates that this increase in overall sales is statistically significant.

“Replenish”. The “replenish” nutrient claim had the lowest increase of purchases in the white-collar operations with only a 7% increase and a 130.8% increase in blue-collar operations (Figure 4). It was not found to have a statistically significant difference between overall pre- and post-intervention sales.

“Fit”. The percentage increase of purchases for the “fit” nutrient claim for the blue-collar operations was 285.7% (Figure 4), whereas for the white-collar operations, it was only 32.3% (Figure 3). Overall, there was not a statistically significant difference between pre- and post-intervention sales (Table 2).

“Avoiding Gluten”. This nutrient claim was more influential in the white-collar environment when compared to blue-collar. The percent increase of the “avoiding gluten” snacks was recorded as 100% in the white-collar operations (Figure 3) and 58.6% increase in the blue-collar operations (Figure 4). There was not an overall statistically significant difference between the pre- and post-intervention sales for the “avoiding gluten” label, but when examining the data based on operation type, it was found that white-collar operations did have a statistically significant increase in the sales of “avoiding gluten” snacks, $t(5) = 4.135, p \leq 0.01$.

White-Collar versus Blue-Collar. Although there was a statistically significant increase in white-collar sales, blue-collar sales, and overall sales, there was not found to be a statistically significant difference between white- and blue-collar operations sales of snacks with nutrient claims. It is interesting to note that the nutrient claim category found to have a statistically significant increase in sales of snacks for each group was different. The white-collar operations sales included those in the “mindful” and “avoiding gluten” categories, while the blue-collar operations included “energy.”

Retail Snacks and Purchasing

As previously mentioned, the products with the “mindful” nutrient claim increased the most sales in the white-collar working environment. The snacks that were included in this nutrient claim category were the oatmeal raisin bar, chocolate protein bar, and salted nuts. When comparing the percentage change of these three products, it was found that the chocolate protein bar had the greatest percentage change than the other two snacks in this category. The percentage change for this snack was calculated to be an 850% increase. Whereas the oatmeal raisin bar had the least influence when compared to the other “mindful” snacks with an increase of 150%.

The “fit” nutrient claim products had the most increase in sales in the blue-collar working environment. The snacks that were included in this nutrient claim category were the oats and honey bar, blueberry bar, and strawberry bar. When comparing the percentage change of these variables, it was found that the oats and honey bar had the greatest percentage change compared to the other two snacks labeled with the “fit” claim. The percent increase for this bar was computed to be

1050%. The total percentage change of 285.7% for the “fit” category, was the nutrient claim with the highest percentage change in sales in blue-collar operations.

Discussion and Conclusions

The objective of this study was to determine if nutrient claims on snacks have the potential to influence the purchases of retail snacks in corporate work environments. A nutrient claim intervention was created which categorized snack items into one of six categories. A mobile cart was designed (Figure 1) to display the snacks and nutrient claims at each of the four participating corporate foodservice accounts. Based on nudge theory and current literature, it was hypothesized that there would be an increase in sales of snacks with nutrient claims compared to the same snacks prior to the implementation of the claims (supported). It was also hypothesized that there would be a larger increase in sales of snacks with nutrient claims in a white-collar setting compared to a blue-collar setting (rejected).

Overall, the data suggests that the sales did increase after the implementation of the nutrient claims in both work settings when compared to the sales of the same snacks prior to implementation of the claims. The total sales increased by 50.8% after the nutrient claims were implemented. These results were supported by current literature that stated marketing is a powerful educational and selling tool. Nutrient marketing has been found to be correlated with greater snack consumption and possibly aid in reducing obesity (Loureiro et al., 2012). When it comes to nutrient claims, findings from other studies revealed that products with a nutrient claim are 75% more likely to be chosen than an identical product without a claim (Kaur et al., 2017). Additionally, the convenient placement of the snack cart could assist in increasing the sales of healthier snacks in both types of locations.

Purchases of Nutrient-Dense Snacks

Past literature stated that snacks are generally encouraged to promote the feeling of satiety and aid in portion control, however, individuals tend to consume snacks that are high calorie and low nutrient-density (Barnes et al., 2015). In this study, the nutrient claims were utilized to highlight snack items that contained some nutrition benefits. This includes a good dietary source for protein, fiber, and relatively low in calories. The results of this experimental study indicated that nutrient claims could increase purchases of nutrient-dense foods. As previously mentioned, total sales of snacks increased when the nutrient claims were present. Interestingly the sales of snacks in the “energy”, “mindful” and “superfood” categories were found to have an overall significant increase, but when broken down by location, the “mindful” and “avoiding gluten” categories had significant increases in the white-collar operations while the “energy” category had a significant increase in the blue-collar operations. The findings of this study suggest that nutritional marketing has a strong influence on snack purchases in a corporate work setting. Therefore, how the nutrient-dense snacks were presented to consumers contributed to the extent of purchases.

Purchasing Trends

Interestingly, the blue-collar operations total sales increased by 79.8% after the nutrient claims were implemented, whereas the total sales for white-collar operations only increased by 33.2%.

The marketing and/or placement of the mobile snack cart may have been more persuasive in the blue-collar working environment.

It is helpful to examine the reason for the increase in sales at the blue-collar locations. Perhaps, these chosen snacks were already commonly being purchased by the white-collar population which led to a lower percentage change when the nutrient claims were implemented. Future research should explore how nutrient claims can increase overall sales of more nutritious snacks through carefully examining the population. The increase in sales could be due to a number of factors, including the location of the snack cart, the types of snacks being offered, or the nutrient claims themselves.

Blue-collar work is characterized as skilled or unskilled physical labor, usually in a manufacturing or factory setting (Lips-Wiersma et al., 2016). Considering this definition, it is interesting to note the type of nutrient claim in the blue-collar settings that had the most significant increase were those in the “energy” category. In contrast, white-collar work is characterized as work performed in an office or administrative type building (Lips-Wiersma et al., 2016) usually consisting of knowledge work or other thought-based activities. The sales of snacks in the “mindful” category were among the significant nutrient categories for the white-collar operations. However, further inspection could be that the label “mindful” was misunderstood, as the parameters for snacks to be included into this category were that they were under 250 calories and were sustainably conscious organizations. Further research into the subtle differences in the nutrient claims could result in different snacks being chosen.

When the sales of the work environments were combined for the percentage change analysis, it was found that the “mindful” claim overall had the greatest change compared to the other nutrient claims. This data suggests that the “mindful” nutrient claim was more of an interest in both populations. It is possible that more people are searching for more outlets to support the community and the environment. This finding revealed that the environment may be more of a priority compared to “nutrient” enhancement.

Theoretical Implications

Research has shown that product placement can increase sales of items. This research project found similar results. The snack cart with nutrient claims (figure 1) was conveniently placed near the checkout register in corporate foodservice operations. This gentle “nudge” of product placement made these snack items more prevalent than having them mixed in with other snacks that did not include nutrient claims or product placement. This research confirms previous findings within Nudge Theory literature. If employers want to encourage healthier snack choices, having them as a convenience point can significantly increase the sales of those snacks.

Practical Implications

Based on this study, nutrient claims could be used in the future as a marketing tool to highlight more nutrient-dense snack options in corporate working environments. These findings may be an incentive for employers to highlight healthier snack items in their operations to increase sales and help employees reach their nutrition goals. The healthier focus could also assist in lowering

healthcare costs. Nutrient claims backed by registered dietitians is an important step towards data-based claims.

This experimental study aimed to provide information on how nutrient claims can assist in snack choices. Overall, the results found that nutrient claims do meet employees' wellness interests and have the potential to increase sales of snacks in corporate foodservice settings. The location of the snack cart, along with the nutrient claims, could help foodservice operations increase the sales of healthier snack options, while also providing employees with choices. This study indicated that the marketing and presentation of snacks influence sales in a positive manner. As health and wellness become a larger focus in corporate America, finding creative ways to encourage healthier snacking is imperative. The use of nutrient claims that are backed by a systematic approach (i.e. researched by registered dietitians) can contribute to a healthier work environment which may then increase overall workplace satisfaction.

Limitations and Future Research

There were some limitations to this study. First, the two white-collar locations may have had a greater opportunity for purchases of the chosen snack items compared to the two blue-collar operations. The white-collar job locations had more flexibility in the number and length of breaks compared to that of the blue-collar jobs. This could have influenced the number of purchases recorded at each location. The seasonality in which the snack interventions were implemented at each site differed for times of the year. Seasonality could affect purchasing as colder days may lead to people being less likely to leave the site to obtain food. Future research should explore the role of seasonality in the purchasing of onsite food within corporate work environments.

The reliability of the foodservice managers is another limitation to consider when interpreting the data. The managers were trained on how to properly implement and sustain the nutrient claim cart throughout the study. However, the managers have not supervised the entire duration of the study and were expected to utilize the training at their foodservice operations. Therefore, there is no certainty the snack cart was always maintained correctly at each corporate location.

The final limitation of this study is the varying hours that each café was open for service. Each of the four locations had different hours of service and availability for purchase. For example, the blue-collar locations had 1st and 2nd shift employees which lead to workers arriving and leaving work at different times in the day. To reach both shifts of employees, the blue-collar locations offered longer purchasing times for retail snacks using self-checkout after hours of service. The white-collar locations do not have 2nd shift employees. Therefore the longer operating hours in the blue-collar locations could have influenced the total purchases recorded during the study.

Future research can continue to explore the use of nutrient claims within corporate foodservice locations by replicating this study but varying where the nutrient claims are listed. Based on nudge theory, the more readily accessible products are, the more likely they will be purchased. Researchers may consider expanding on this project by looking at the placement of the snack cart within the facility. Future research should also consider conducting mixed-methods research by interviewing or surveying people at the point of sale while still maintaining the snack carts with nutrient claims. It is important to note, if nutrient claims are being added, ensure that they are being evaluated by a registered dietitian to ensure they meet proper health guidelines.

References

- Arno, A., & Thomas, S. (2016). The efficacy of nudge theory strategies in influencing adult dietary behaviour: a systematic review and meta-analysis. *BMC Public Health*, *16*(1), 1-11.
- Barnes, L., French, A., Harnack, J., Mitchell, R., & Wolfson, J. (2015). Snacking behaviors, diet quality, and body mass index in a community sample of working adults. *Journal of the Academy of Nutrition and Dietetics*, *115*(7), 1117–1123.
- Basch, C., Kernan, W., & Menafro, A. (2016). Presence of candy and snack food at checkout in chain stores: Results of a pilot study. *Journal of Community Health: The Publication for Health Promotion and Disease Prevention*, *41*(5), 1090–1093.
- Benson, T., Lavelle, F., Bucher, T., Mooney, A., Egan, B., & Dean, M. (2018). The impact of nutrition and health claims on consumer perceptions and portion size selection: Results from a nationally representative survey. *Nutrients*, *10*(5), 656.
- Campbell, S., Brosnan, B. J., Chu, A., Skeaff, C., Rehrer, N., Perry, T., & Peddie, M. (2018). Sedentary behavior and body weight and composition in adults: A systematic review and meta-analysis of prospective studies. *Sports Medicine*, *48*(3), 585–595.
- Chau, J., Van der Ploeg, H., Merom, D., Chey, T., & Bauman, A. (2012). Cross-sectional associations between occupational and leisure-time sitting, physical activity and obesity in working adults. *Preventive Medicine*, *54*, 195–200.
- Eriksen, D., Rosthoj, S., Burr, H., & Holtermann, A. (2015). Sedentary work—Associations between five-year changes in occupational sitting time and body mass index. *Preventive Medicine*, *73*, 1-5.
- Franco-Arellano, B., Bernstein, J., Norsen, S., Schermel, A., & L'Abbé, M. (2017). Assessing nutrition and other claims on food labels: A repeated cross-sectional analysis of the Canadian food supply. *BMC Nutrition*, *3*(74), 1-16.
- Garza, K., Ding, M., Owensby, J., & Zizza, C. (2016). Research: Impulsivity and fast-food consumption: A cross-sectional study among working adults. *Journal of the Academy of Nutrition and Dietetics*, *116*, 61–68.
- Hodgkins, C., Egan, B., Peacock, M., Klepacz, N., Miklavec, K., Pravst, I., & Raats, M. (2019). Understanding how consumers categorize health related claims on foods: A consumer-derived typology of health-related claims. *Nutrients*, *11*(3), 539.
- Kaur, S., Scarborough, P., & Rayner, M. (2017). A systematic review, and meta-analyses, of the impact of health-related claims on dietary choices. *International Journal of Behavioral Nutrition and Physical Activity*, *14*(1), 1-17.
- Leung, S.L., Barber, J.A., Burger, A., & Barnes, R.D. (2018). Factors associated with healthy and unhealthy workplace eating behaviours in individuals with overweight/obesity with and without binge eating disorder. *Obesity Science & Practice*, *4*(2), 109-118.
- Lips-Wiersma, M., Wright, S., & Dik, B. (2016). Meaningful work: Differences among blue-, pink-, and white-collar occupations. *Career Development International*, *21*(5), 534.
- Loureiro, L., Yen, T., & Nayga, M., Jr. (2012). The effects of nutritional labels on obesity. *Agricultural Economics*, *43*(3), 333-342.
- Onufrak, S. J., Watson, K. B., Kimmons, J., Liping, P., Khan, L. K., Hee Lee-Kwan, S., & Park, S. (2018). Worksite food and physical activity environments and wellness supports reported by employed adults in the United States, 2013. *American Journal of Health Promotion*, *32*(1), 96-105.
- Payne, C., Niculescu, M., & Barney, C. (2014). Consumer consumption intentions of smaller packaged snack variants. *International Journal of Consumer Studies*, *38*(3), 238-242.
- Pearson, K., Tey, S., Gray, A., Chisholm, A., & Brown, R. (2017). Energy compensation and nutrient displacement following regular consumption of hazelnuts and other energy-dense snack foods in non-obese individuals. *European Journal of Nutrition*, *56*(3), 1255-1267.
- Schuster, M., Painter, J., Bernas, R., & MacKenzie, J. (2017). Consumers' social feelings as a function of snack type. *Journal of Family & Consumer Sciences*, *109*(4), 41–46.
- Talati, Z., Pettigrew, S., Dixon, H., Neal, B., Ball, K., & Hughes, C. (2016). Do health claims and front-of-pack labels lead to a positivity bias in unhealthy foods? *Nutrients*, *8*(12), 787.
- Thaler, R.H., & Sunstein, C.R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. Yale University Press.