

Waistlines and Bottom Lines

How Eliminating Junk Food from a School's Cafeteria Affects Sales Revenue

Observation

Every day, all across the country, millions of kids file into their school cafeterias to buy lunch. If school lunch conjures up an image of ravioli, french bread, green beans, and canned peaches, think again. While the traditional cafeteria lunch is still available, most schools now also sell a la carte meals and snacks, and more kids than ever are making a lunch of chips, sodas, and cupcakes. School districts come to rely on the income from these Snack Shacks and Beaneries to help balance their budgets, and although parents and teachers may have concerns about poor nutrition, in a time of shrinking funding for schools, it is hard to insist that physical health should trump fiscal health. Most schools are just too afraid of losing money to stop selling the junk kids love to buy.

However, it is well known by parents that if children are offered a choice of soda or juice, they will choose soda, but if only juice is offered, they will drink juice. Although a ban on chips, sodas, and other unhealthy foods in school cafeterias might result in an initial decrease in sales, much of the lost income might eventually be recouped when students become accustomed to buying the healthier choices offered to them.

Research

In this country last year, there were three times as many overweight adolescents as in 1980. Type-2 diabetes, hypertension (high blood pressure), and high cholesterol are increasing among youth. In response, school districts such as Oakland and Los Angeles have banned the sale of sodas in their schools.

What's wrong with soda?

Consumption of soda has been linked to broken bones, osteoporosis, obesity, diabetes, kidney stones, nervousness, insomnia, and attention deficit disorder. The caffeine in most sodas interferes with kids' ability to concentrate and stay on task, and the sugar contributes to diabetes, obesity, and tooth decay.

The risks are even greater for girls. A recent study by a Harvard School of Public Health professor found that physically active teenage girls were 5 times more likely to suffer from broken bones if they were cola-drinkers than girls who did not drink carbonated beverages. The phosphoric acid in cola is believed to interfere with calcium absorption. In addition, girls who drink soda instead of milk are denying their body the calcium it needs to build strong bones, and are likely to suffer from brittle or fragile bones later in life.

What about other Beanery foods?

Other foods commonly for sale in cafeterias feature high levels of salt and fat. For example, more than half the weight of a bag of regular (fried) chips comes from oil, which is fat. Chicken wings and french fries are other examples of high salt, high fat foods. Excessive fat intake has been linked to obesity, high blood pressure, heart disease, kidney disease, and cancer. Too much salt can lead to high blood pressure and can cause the body to excrete other needed minerals, like calcium. Portion size can be a problem, too. Choices like pizza and hamburgers

which might be acceptable in normal portions are often sold in giant portions big enough for two or more servings.

What kind of Beanery choices would be considered nutritious?

Lots of them! Juice which is 100% fruit juice (not 10% juice and 90% sugar water), milk, spring water, fresh sandwiches with low fat turkey or roast beef, sushi, bagels, fresh salads and fruit, yogurt, low fat string cheese, fresh soup, applesauce, fruit cups, and normal portion sizes of pizza and hamburger.

Purpose

The purpose of this project is to track sales in the Aptos Middle School Beanery over the course of the 2002-03 school year, to see what effect the removal of junk food and the introduction of healthy food has on sales. The research question is: Will replacing junk foods with nutritious foods cause Beanery sales revenue to drop?

Hypothesis

The Aptos Student Nutrition Committee believes that, although sales will initially decline when junk foods are removed from the Beanery, over the course of several weeks, sales will increase to the same level as before junk foods were removed.

Materials

Copies of Beanery sales figures from each week of the 2002-03 school year
Calculator

Variables

The independent variable (the variable which can be changed at will) is the food offered for sale in the Beanery

The dependent variable (the variable which will change as a result of the independent variable) is the amount of Beanery sales revenue

The controlled variables (the things which remain the same throughout the experiment) are the student population who can buy food in the Beanery, the length of the lunch period, the time of day of the lunch period, the cafeteria manager who records the sales figures, the prices of the foods which continue to be served throughout the experiment, and the location of the Beanery.

Procedure

Beginning the week of January 6th, unhealthy choices started to be removed from the Beanery. The first items to go were chips, soda, and Gatorade, followed by Slim Jims, nachos, juice drinks which were not 100% fruit juice, and Hostess snack cakes.

Students were surveyed to find out what kinds of new foods they would like to see featured in the cafeteria. Based on student requests, new foods offered for sale included freshly made sandwiches, homemade soup, and yogurt. Giant round pizzas were replaced by individual slices with a side salad; Mega Deluxe cheeseburgers were replaced by a more modest size hamburger. Chow mein and fried rice continued to be offered some days. Desserts included individual fruit cups and fresh fruit.

Sales figures were obtained from the SFUSD Student Nutrition Office, dating from the first week of school through the end of January. Weekly sales figures will continue to be collected and studied through the end of the school year.

Results and Analysis

Using the daily sales data provided by the SFUSD Student Nutrition office, a table was compiled showing daily sales totals for every day from the start of the 2002-03 school year, through January 31st (note that the compilation of data will be ongoing through the end of the school year; this report focuses on data available as of February 3). At this point, it became clear that not every week was comparable to every other week - some weeks, such as before the Thanksgiving break, comprised only 3 sales days; some weeks, such as the week of Labor Day, comprised 4 sales days, while a typical week had 5 sales days. It is possible to calculate a mean daily sales figure for each week (total the sales for each day in the week and divide by the number of sales days in that week), which would produce a figure valid for comparison regardless of the number of days in the week.

However, using this type of average would not correct for another discrepancy which surfaced - that is, the fact that, on typical sales days, there are three Beanery lines which sell food. Because of illness and other factors, there are not always enough cafeteria employees to staff all three lines, so on some days, there are only two lines operating, and on some days, only one line. Sales on these days are always far below average, and can bring down the mean for the week in a way which is not really representative of typical sales.

When working with a set of numbers to find an average, a number which falls very far above or below the other numbers in the set is called an outlier. Using the median (the middle number) of a set of numbers gives a more accurate comparison if there are outliers, because the median focuses only on the middle number in the set, and the highest and lowest numbers have no effect at all. For this reason, average daily sales figures per week were calculated using the median rather than the mean.

As is clear from the graph, although sales were highest during the first four weeks of the school year, revenues had leveled off by the week of Sept. 23, and remained in the range of about \$730 - \$820 dollars per day throughout the late September - mid December period.

When school resumed after the winter holiday, the program to replace junk foods with healthier choices began. During the first two sales days in January, soda and chips were removed. Over the course of the next four weeks, Hostess snack cakes, Slim Jims, nachos, and juice drinks which were not 100% fruit juice were discontinued. Although sales dropped during the first week of the program (January 6), median sales for that week (\$731) were not substantially lower than sales for several other weeks prior to the ban on junk foods, notably the week of October 15th (\$746), the week of October 28th (\$732), and the week of November 18th (\$749). The drop was short-lived, however. By the following week (January 13th), sales reached their highest level since September 16th, and continued to climb over the next two weeks.

Although there had been dire predictions for what would happen to sales revenues if soda and chips were no longer available for sale, the actual result was that sales went up, not down. From the observation of school staff, and from studying the sales records, it seems clear that the increase in sales revenue is due to students buying less snack items and more real food. Students who formerly made a lunch of a bag of chips and a can of soda, are instead buying a bottle of juice and an entree, which costs more than the snack lunch.

An additional benefit of the elimination of junk food is that teachers have reported improved student behavior during the class periods after lunch. Another unexpected benefit is that there is less litter on the yard, as students consume a real lunch served on a plate. These lunches tend to be eaten inside the cafeteria, and the garbage disposed of in the cafeteria garbage can, while the chips and soda lunches were more frequently eaten while standing outside on the yard. Although there are garbage cans on the yard, the students don't use them as reliably as they use the ones in the cafeteria.

Conclusion

The hypothesis was that removal of junk foods from the Beanery would cause sales to decline initially, but that over a period of weeks, sales would climb back to the same level as before the junk food ban. The hypothesis was not exactly correct; sales did initially decline, but only for one week, not several weeks, and sales for that one week were not significantly below sales for several other weeks before the ban. By the second week, sales had not only returned to typical pre-ban levels, they were actually slightly higher than those levels. The removal of junk food from the Beanery did not cause the Beanery to lose money; on the contrary, sales went up.

What's Next?

During the month of February, the project will concentrate on replacing high fat/high calorie entrees with healthier choices. Burritos, taco pockets, chimichangas, chicken wings, hot links, and fries are being discontinued. In an attempt to accommodate student requests from the initial survey, more fresh sandwiches, sushi, homemade soup, and salads are being offered. Giant servings of pizza and enormous cheeseburgers are being replaced by more appropriate portions, and are accompanied by a side salad. A wider variety of fruit-based desserts is being introduced, and the sale of home baked cookies is being limited to two or three days a week, rather than five. Better signage is being placed in the cafeteria to make sure students are aware of what choices are available each day.

Revenues can be expected to continue to fluctuate as old favorites disappear and new choices are introduced. There may be some days when entrees run out before every student is served, and others when some entrees may go uneaten. As more data becomes available on what healthy items students prefer, the daily menus will be adjusted accordingly. The Aptos Student Nutrition Committee expects to continue tracking sales data through the end of the year. It is hoped that the model which we are developing at our school can be replicated at other middle school sites, to the benefit of both waistlines and bottom lines.

About the Aptos Student Nutrition Committee

This report was produced by the Aptos Middle School Student Nutrition Committee. The committee is made up of parents, teachers, and administrators, who share a common concern for the health of our students. Banning soda and chips is not the entire answer to the health problems which beset today's youth, but it is an important part of the answer. Other parts include more education about the connection between food choices and health, and more exercise. The Student Nutrition Committee addresses all of these needs, and encourages everyone who cares about our youth to do the same.

Our school is located at 105 Aptos Avenue in San Francisco. For more information on the Aptos Student Nutrition Committee or our pilot program to offer healthier foods in the Beanery,

please contact Principal Linal Ishibashi at 415-469-4520.