Healthy Vending and Concession Initiative and Implementation

by

SCOTT HOFFMAN

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Dr. Deon van der Mewre
Dr. Deb Canter
Dr. Robert Larson

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Virginia Barnard, MPH

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Chapter 1 – Focus of Field Work

Introduction

My field experience work has been extensive and comprehensive, leading me to benefit from a breadth of experiences. I have visited many locations and attended numerous meetings during my field experience. I engaged in many meetings at the Riley County Extension Office at 110 Courthouse Plaza with Ginny Barnard to discuss activities and policy plans to better the community, and I have also attended Flint Hills Wellness Coalition meetings there as well. Through K-State Research and Extension, I had the opportunity to participate in educational programs in many elementary schools in the Riley County area. During those visits, Ginny Barnard, myself, or both of us would teach nutritional lessons. With the Help of Gregg Eyestone, horticulture agent of K-State Research and Extension, we planted and harvested gardens with the elementary students, consisting of 175 fourth graders. For another aspect of my MPH field experience, I was employed as an intern in the Human Resources Department of Manhattan City Hall to help promote healthy vending. My internship opportunity with the City of Manhattan was made possible through Ginny Barnard's role on the leadership team with the Flint Hills Wellness Coalition. The Flint Hills Wellness Coalition (FHWC) meetings have been held in several different locations, but they are always held with the same mission, to build a healthier community. The FHWC brings prestigious members of the community together to discuss and disseminate public health ideas and information for eventual implementation in the Manhattan area. In addition to all of these locations, I have also made an appearance at the headquarters for Five Star Vending to discuss the main focus of my MPH field experience, the healthy vending initiative.

Healthy vending policies in Johnson County, Kansas and other Kansas Communities have become a recent area of interest in light of the overweight and obesity endemic in the United States [2]. Johnson County is currently using the same standards in their concession stands and vending machines that the FHWC is trying to implement into the City of Manhattan; they are calling it the "SCORE!" campaign [24]. The mission of the Healthy Foods-Johnson County, Kansas Coalition is to provide greater access to healthy foods for their community. The Coalition also promotes policy and environmental changes to support their mission. Healthy vending is not just an interest in the U.S.; a study in Queensland, Australia examined implementations of healthier foods into healthcare facilities via many routes, including vending machines [18]. Even schools in the Netherlands recorded an approximate 10% increase in healthy foods held in all vending machines over the past five years. They have also documented an obesity trend in schools with copious amounts of unhealthy vending options [22].

Reasoning for Healthy Vending Food and Beverage Options

It does not come as a surprise to most Americans to hear that obesity and overweight rates have increased exponentially over the past few decades. Youth overweight (including obesity) rates were barely breaching a quarter of the United States' school-age children in 2000, but by 2004 this number had inflated to over 35% of school-age children. The U.S. childhood overweight and obesity rates are among the highest in the world [14]. According to the CDC, the rate for just obesity in adults surpasses both the overweight and obese rates of children combined.

Weight watching, however, is not the key reason behind healthy vending in my opinion. For example, we added dry roasted edamame into the vending machine at the Manhattan City

Hall. The edamame, like many natural foods, possesses functional components. A couple of the functional ingredients in edamame are isoflavones and genistein, which are both phytochemicals. Research has indicated that these two phytochemicals may have a beneficial effect on bone formation and lowering LDL cholesterol [(7)].

City and State Vending Policy Changes

San Diego is much further ahead in the healthy vending game than the rest of the nation. The City of San Diego set a vending machine policy mandating that 100% of the food and drinks sold in the machines at sports and recreation facilities meet their nutritional standards set by Senate Bills 12 and 19 [(12)]. Those standards must also be met by 50% of the foods and beverages in parks and open spaces in San Diego. The Director of Parks and Recreation signed the policy change in March 2006. After the policy was incorporated, staff of the San Diego Department of Parks and Recreation contacted the vendors and explained the new policy must be implemented by spring 2006. The staff continued to explain that companies not complying with the new policy would not have their contracts renewed [(12)]. Johnson County, KS is planning on taking a similar approach and there is interest in Manhattan, KS to promote like ideas.

Kansas State Research & Extension and Collaborating Organizations

My field experience work began with Riley County K-State Research and Extension Agency, but expanded to Manhattan City Hall with the Department of Human Resources [(8)]. K-State Research and Extension is a branch of Cooperative Extension, which is a national education network used to extend research findings and technical expertise to people in counties and communities. The Cooperative Extension was established in 1914 and is committed to

expanding human capacity by improving leadership in the areas of communication, conflict resolution, and strategic planning to enhance the quality of life in communities. The extension branches of the Cooperative Extension are funded by federal, state and county governments. The mission statement for Riley County K-State Research and Extension is, "We are dedicated to a safe, sustainable, competitive food and fiber system and to strong, healthy communities, families and youth through integrated research, analysis and education." [(11)].

Ginny Barnard was one of the first three students to graduate from the MPH program at Kansas State University. Mrs. Barnard's range of work is comprehensive and involves many aspects of the community health and wellness, especially in the area of nutrition. I have helped Ginny Barnard with many different facets of her work, including: educational programs, community outreach, capacity-building, and program evaluations. She has continuously helped with events in the Manhattan community from Park Quest to Walk Kansas, which are two of the most recent, but she has been doing much more than just that. Some integral responsibilities of Mrs. Barnard's agency position consist of improving the well-being of residents, delivering and evaluating research-based educational programs, and collaborating with other agencies to meet the educational needs of local residents. The latter of that list is sufficiently fulfilled by the FWHC.

Ginny Barnard and Katy Oesteman, received a grant for the Flint Hills Wellness Coalition to promote and propagate a healthier community for the Riley County area. The grant extends over three years for an approximate amount of $75,000 ($25,000 annually). This money has been used to initiate the healthy vending initiative, fund interns like myself, and so much more. The money has helped alleviate the financial concerns of the vendors. We have used some of the grant to subsidize the healthier food options we have requested to be implemented into the

vending machine at Manhattan City Hall. We assumed that by funding the project we may be able to reduce barriers to making environmental and policy changes. In addition, we assumed there would be little to deter the initiative if the financial risks of the vendors were addressed.

The grant that Ginny Barnard and Katy Oesteman received was not an effortless attainment. They drafted a community change model and a written grant proposal. The grant proposal summarized the community change model given below. The grant money is to be used for community education, community mobilization, government policymaker education, and advocacy with organizational decision makers. Community education is self-explanatory in the fact that its prime objective is to educate the public and media about health issues with the intention of influencing behaviors and attitudes. Community mobilization attempts to gain community support, and push the community towards healthier lifestyles. Government policymaker education constitutes the education of local policy makers with respect to the health and economic impact of policy priorities. Finally, the advocacy with organizational decision makers is a prime example of what we are doing now with Five Star Vending. With Five Star Vending we are continually attempting to educate, mobilize, and advocate healthier lifestyles through the offering of healthier products.

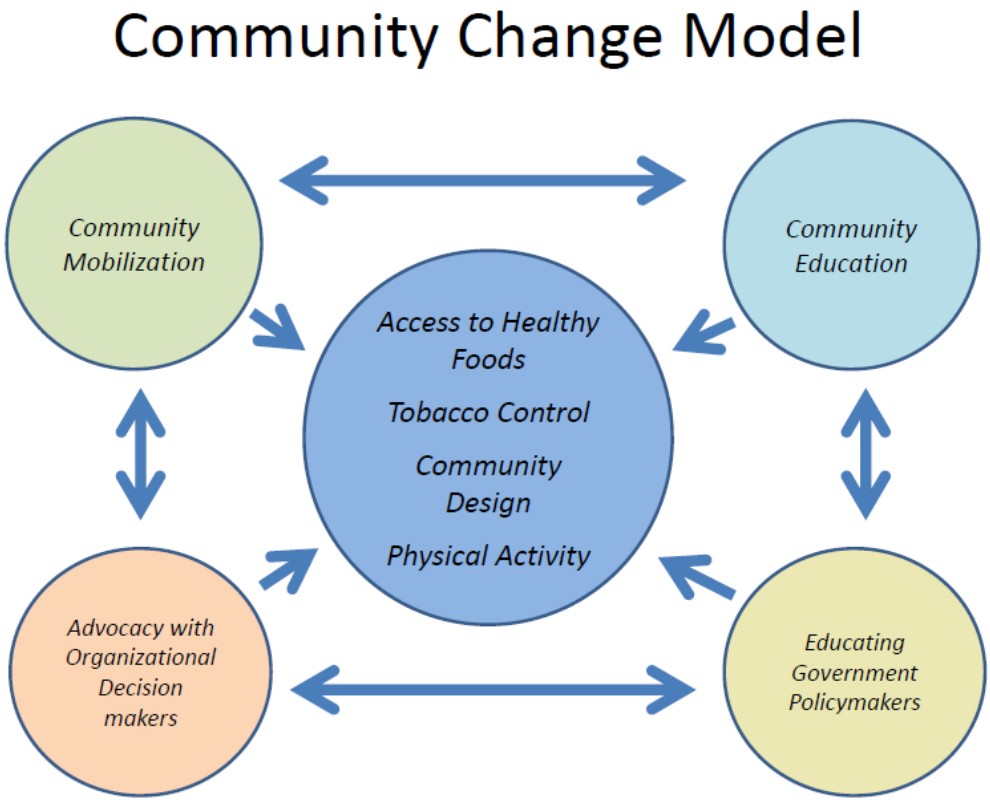


Figure 1.1 – Community Change Model

Chapter 2 – Public Health Education

Objective

The objective of my field experience was to provide public health education to the community of Manhattan, Kansas. Helping educate the workforce of the city and the citizens around the Riley County area has proven to be conducive for attaining an effective outcome for my capstone project completion. Healthy vending will most often be utilized by those that comprehend the benefits and understand that some items in the machine are potentially better

than other options. As a public health graduate student, I have learned the importance of educating the population about health in general. Working so closely with the Riley County Health Department and K-State Research and Extension has only reinforced my outlook towards the importance of public health education.

Interestingly enough, the United States ranked as one of the highest-cost nations for healthcare in 2010, at over $8,000 per person [(9)]. The colossal amount we are spending is clearly not accomplishing its intended goal; the Central Intelligence Agency wouldn't have the U.S. ranked 51st in life expectancy if the money was doing what it should. This lack of accomplishment is only reinforced by the fact that heart disease is the leading cause of death in the United States, followed closely by cancer [(19)]. Many studies have linked reduction of heart disease and cancer risk to better eating habits and nutrition [(17)]. Despite common knowledge that America's obesity and overweight rates have been increasing for decades, the counteraction has been far from overwhelming to say the least. The FDA is at least trying to counter the rising endemic by its attempt to ban partially hydrogenated oils (PHOs), also known as *trans* fats[(6)].

HLAC and Worksite Wellness Attitude Survey and Analysis

One of the first projects of my field experience was to design the graphs for the Healthy Little Apple Coalition (HLAC) of Riley County Perception Survey. The HLAC committee title was changed to the Flint Hills Wellness Coalition shortly after this survey was conducted. In addition to this survey, I was asked by the City of Manhattan to graphically document and create an executive summary for the Worksite Wellness Attitude Survey (WWAS) that was given just prior to my employment. I have included employee participation graphs drafted from the WWAS, which indicates the Manhattan departments that were surveyed.

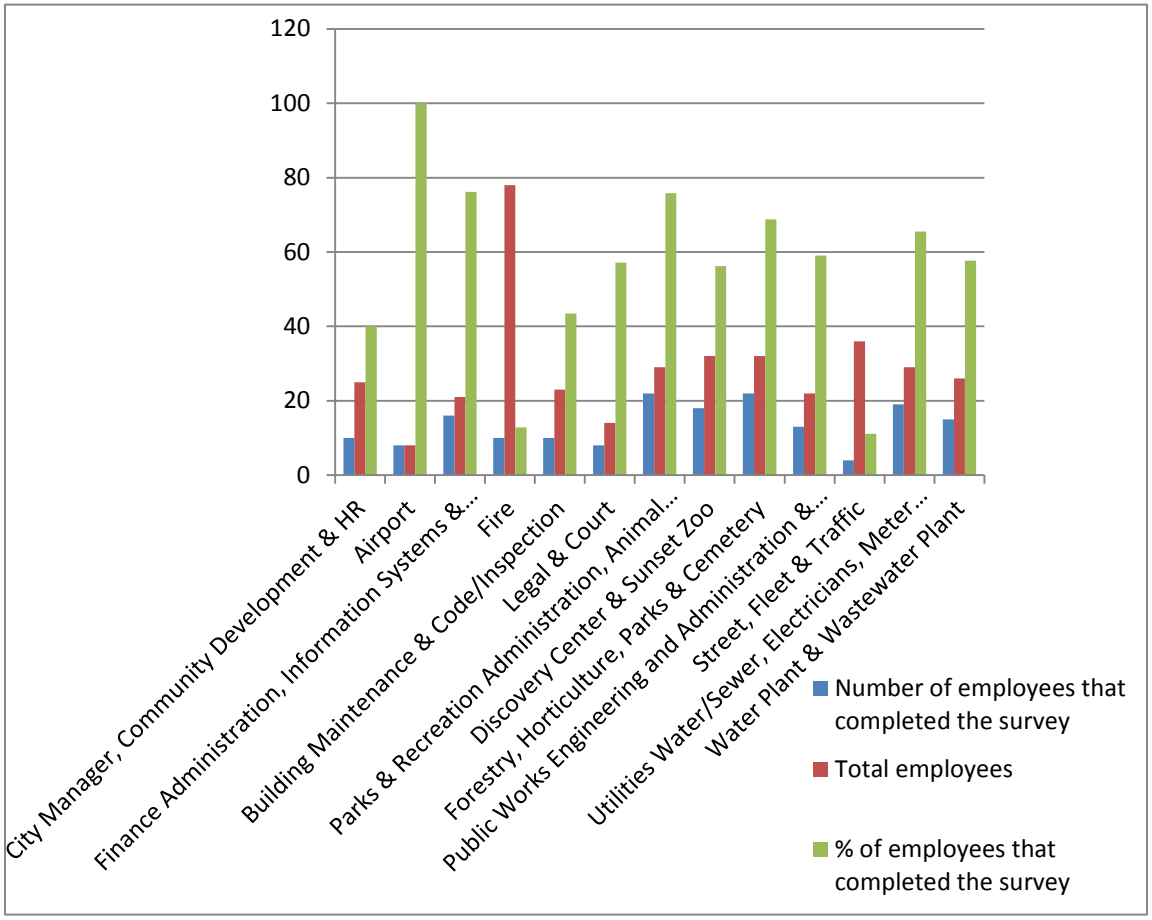


Figure 2.1 Worksite Wellness Attitude Survey Employee Participation Graph

City of Manhattan

Worksite Wellness Attitude Survey

August 2013

206 total employee participants (8 part-time, 9 seasonal, 173 full-time)

Executive Summary

Employees responded to a survey in an attempt to assess their attitudes and perceptions towards nutritional behaviors in the workplace, and the survey placed emphasis on vending machine usage in particular. The extrapolated data from the survey results indicated that if healthier options were to be implemented into the vending machines—not only would employees be more satisfied—but the overall amount of employees using healthy vending options would substantially increase.

Highlights of Survey Results

- Over 60% of the employees indicated that there is a vending machine available at their worksite.
- Over 55% of the employees indicated that they thought about the healthiness of the vending machine choices.
- Greater than 74% of the employees indicated that they would like different choices in the vending machines.
- **More than 40% of the employees indicated that they do not use the vending machines due to a lack of healthy options.**
- Approximately 70% of the employees said that if healthier food options were available they would change their current selection towards those healthier options.
- Slightly over 82% of the employees said they would like healthier options to be available at their worksite.

Reasons Cited for Healthier Vending Machine Choices:

1. Offering healthier options (Nature Valley, Fiber One, Special K, etc) would still provide significant turnaround for vendors, especially when purchased in bulk important to maintaining revenue
2. Offering a wider variety of food choices provides greater opportunity for purchase and satisfaction by consumers.
3. Offering healthier options will provide more satiation than junk foods which may influence an occasional employee customer to become a regular one.

Figure 2.2 Worksite Wellness Executive Summary

The executive summary was used to summarize the results from the survey. I presented the executive summary at one of our monthly Flint Hills Wellness Coalition meetings and we used these results to warrant whether implementing healthier vending options would resonate with the employees or not. We also wanted to gauge the employee's opinions of the vending machines and the volume of use they received. When we saw that over 40% of the City of Manhattan employees that took the survey did not use the machine due to the lack of healthy options, we were less reserved in our decision to implement healthier foods into the machines. This lack of

Figure 2.3 FHWC Logo

(https://www.facebook.com/FlintHillsWellnessCoalition)

inhibition was sparked primarily because we knew we had some leverage with the vending company, Five Star Vending. If the survey results were at all accurate to the employee's actual opinions, then implementing healthier food options would provide a mutual benefit for both the coalition and the vending company.

Elementary Nutritional Education

I am an individual who embraces variety, and that is what I graciously accepted with a significant portion of my field experience work. I have always enjoyed teaching and I have had many opportunities to do so. I have experience teaching elementary children, mainly due to my past years of employment as a teaching assistant for the Shawnee Mission Kansas School District. I helped Ginny Barnard teach nutrition lessons to many elementary classes, as well as teaching many lessons myself. The lessons I taught with and without Mrs. Barnard also enabled me to more efficiently lead a group nutrition education project for one of my classes, public health nutrition (HN 600).

The nutrition lessons were pretty consistent in structure, but the content would vary day to day. Ginny Barnard and I would discuss which food group the day's lesson would encompass. We structured our lessons around the key food groups of MyPlate comprised of: proteins, vegetables, fruits, grains, and dairy. In addition, we started each class period going over the six key nutrients: vitamins, minerals, proteins, carbohydrates (sugars), lipids (fats), and water.

Due to the age of the children, it was wise to make the lessons interactive. With this in mind, we made sure to include games involving the children and food labs at the end of each session. The game used to engage the kids most frequently involved food picture cutouts and having the kids raise their hands to tell us into which food group the cutout belonged. The food

lab was always one of the most exciting events of the lesson for the kids. The foods in the food varied and included: trail mix foods labs, fruit parfait type labs, or an air-popped popcorn food lab. Regardless, lavish or not—the kids still loved the food labs. I found it very interesting to observe the kids be much less prone to complain about the taste of a healthy food when demonstrated in a fun way. Air-popped popcorn has a taste that is extremely less intense and palatable to some individuals, especially in comparison to its heavily oiled and *trans* fat immersed counterpart. Not a single child complained about the lack of added salt, butter, or any other additives.

Elementary Gardening and Harvesting

My field experience was not necessarily restricted to my original area of emphasis of infectious diseases and zoonoses. It significantly—if not mostly—encompassed the field of human nutrition, but these two areas of emphasis are more closely linked than many may realize. Dr. Briggs actually commended me for designing a presentation correlating the infectious disease susceptibility and nutrition in her class, emerging pathogenic diseases (DMP 770). Our food almost always has the potential of being contaminated or infected by animals, either by us consuming the animals themselves, or the way the animals may roam around the plants being grown for harvest and human consumption. Animal and plant products have great capacity to harbor pathogens in many different processes in food production. In the 1900s and even today, cattle or cattle products are/were often infected or conditions worsened during transportation [(10)].

As mentioned previously, my culminating experience was one composed of many facets. One of these facets consisted of work with the fourth grade classes in many different elementary schools around Manhattan, KS. Ginny Barnard, Gregg Eyestone, and I planted

gardens with the classes and eventually harvested them a couple months later. Gregg Eyestone is Ginny Barnard's co-worker specializing in horticulture. Mr. Eyestone suggested the vegetables to plant and in cooperation with Mrs. Barnard, he designed worksheets that generated a great amount of interest from the children, despite being slightly complex for their learning levels. The worksheet was composed of dozens of different types of vegetables, their best growing season, best harvesting time, and all the main vitamins and minerals attributable to them. We went around the classroom helping the children finish and fill out the worksheets while preparing the equipment to go outside to the garden beds.

The vegetables that were planted were those with a rapid time to harvest. The plants would only have a short time to grow (about two months), so it was imperative that we plant seeds that matured quickly. In addition, the seeds we planted must be of the varieties that were in season for the Kansas climate at that time. We had the kids help us plant: lettuce, spinach, radishes, and onion sets. After we planted the seeds we needed to wait a couple of months before harvest. After the two months had passed we went out and harvested the garden with the kids.

Once the harvest was finished, we brought the kids inside to try the fruits of their labor. Mrs. Barnard and I took care of washing the vegetables to rid the food of any insects or dirt. Mrs. Barnard had individual salad bowls for the kids, which were made from decomposable cardboard-like substance. The portion of salad we gave them was relatively small; this served as a precaution against waste in case they didn't like the salad. Expecting them to eat a plain salad is unrealistic, so we brought little spray bottles of salad dressings.

Water Conservation Project and Booth

One of the first projects Mrs. Barnard assigned me during my field experience was to design and help setup a water conservation booth for the Manhattan Area Garden Show held at Pottorf Hall. Mrs. Barnard and I designed the following pages and expanded them to fit a large cut out display to make our booth. In addition, we ordered water conservation items for display with which interested attendees could interact with. We also had educational handouts available for anyone interested attending the event.

Figure 2.4 – Water Conservation Title Page

Tips for saving water

In the bathroom

- When waiting for hot water before getting in the shower use a bucket to collect the cold water to use on outside plants saving you up to 300 gallons a month.
- Turn off the water while brushing your teeth and save up to 3 gallons each day.
- Check toilets for leaks by putting food coloring in the tank and seeing if the water color changes without flushing. A leak could cause gallons a day to be wasted while not in use.
- Set toilets to ultra-low flush mode to save one and a half gallons per flush.

In the kitchen

- Don't defrost food with water. Either place it in the fridge overnight or use the microwave to save up to 250 gallons a month.
- Washing dishes by hand can save up to 500 gallons a month instead of using the washing machine.
- Fix leaky faucets, one drop a second can waste 2,000 gallons of water a year.

Outside

- Rain barrels provide natural rainwater for consumption or for any other method of water usage and make for a convenient method for watering plants.
- Put mulch around trees and plants to increase water retention and reduces evaporation saving 750 to 1,500 gallons a month.
- When mowing set your blades one notch higher to reduce evaporation and save 500 to 1,500 gallons a month.
- When washing your car park it in your lawn to water your grass.

Saving water saves energy because energy is used in pumping and treating water!

Figure 3.5 – Water Conservation Tips Page

Water Conservation Facts and Statistics

- 783 million people (11%) in the world do not have access to safe drinking water.
- Approximately 700,000 (2,000 per day) children die every year from diarrhea induced by unsanitary drinking water.
- The average North American uses 400 liters of water daily.
- Less than 2% of the Earth's water supply is actually fresh water.
- The human body is 75% water (indicating our need for it).
- A healthy individual could survive about a month without food, but would not be able to survive more than a week or less without water.
- Every day in the United States we drink 110 million gallons of water
- A little more than 25% (27.5 million gallons or more) of American water use is contributed to showering and bathing.
- You can refill an eight ounce glass of water nearly 15,000 times and pay the same price as an average six-pack of pop.

References

Creehan, Elizabeth. "Conserve Water." *Volunteer Guide*. N.p., n.d. Web. 1 Feb. 2013. http://www.volunteerguide.org/minutes/service-projects/water-conservation?gclid=CLiEk-bPmrUCFVSSPAod1kwAGQ

"Donate Now." *WaterAid America*. N.p., n.d. Web. 1 Feb. 2013. http://www.wateraidamerica.org/what_we_do/statistics.aspx?gclid=CL7q65jTnbUCFeGrPAod6x4A3g

"Water Conservation." *Water Conservation*. Mojave Water Agency, n.d. Web. 1 Feb. 2013. http://www.sscwd.org/tips.html

Figure 4.6 – Water Conservation Facts Sheet

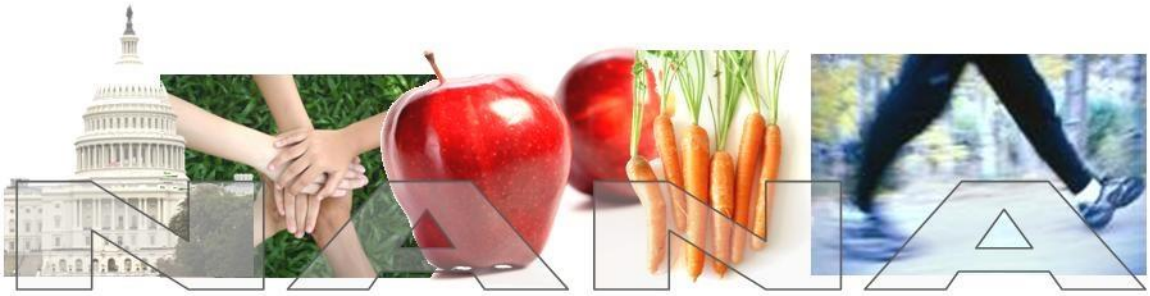
Product Sales for Five Star Vending

Before Mrs. Barnard and I began contemplating the food items to add into the vending machines at our trial location in Manhattan City Hall, we felt it necessary to analyze the sale and restock of certain products. More or less, we wanted to find out what the vending consumers of Manhattan purchased most often from the machines. I requested the sales data from Terry Francis, which he quickly provided. Five Star Vending records their monthly sales, but compounds them by quarter.

Chapter 3 – City of Manhattan Healthy Vending Initiative and Implementation

Nation Alliance for Nutrition & Activity Vending Standards

As part of the field experience I was asked to create a survey after Mrs. Barnard and I had ordered the foods that fit our guidelines. Some of the foods were an improvement, but did not meet the National Alliance for Nutrition & Activity (NANA) Model [(2)]. However, we ordered the food before attending the NANA meeting, so the proper standards were not solidified at that point; despite that fact, nearly all the foods we ordered met the standards. Mrs. Barnard and I both made contributions to the food selections, and as stated previously, almost all selections met the NANA standards. The only item that does not qualify for the NANA standards that we did implement is the trail mix, due to the size of the package—rather than nutritional content. The NANA vending standards are listed below [(2)].



Model Beverage and Food Vending Machine Standards

A key strategy for obesity prevention is improving access to healthy foods and beverages. Often, there is a lack of healthy options when eating away from home, particularly among selections in vending machines. Applying nutrition standards for foods and beverages in vending machines can improve access to healthier selections.

These vending standards were developed to provide a model for municipal, state, and federal government leased or operated vending machines or vending machines on public property. The standards also could be used by hospitals, private workplaces, and others to support the health of their employees or visitors.

Nutrition Standards

Beverage Standards:

- **100% of beverages must be one or a combination of the following:**
  - Water, including carbonated water (no added caloric sweeteners);
  - Coffee or tea with no added caloric sweeteners (if condiments are provided, sugars and sugar substitutes may be provided and milk/creamer products, such as whole or 2% milk, that have less fat than cream);
  - Fat-free or 1% low-fat dairy milk or calcium- and vitamin-D-fortified soymilk with less than 200 calories per container;
  - 100% fruit juice or fruit juice combined with water or carbonated water (limited to a maximum of 12-ounce container; no added caloric sweeteners);
  - 100% vegetable juice (limited to a maximum of 12-ounce container, no added caloric sweeteners, and ≤ 200 milligrams of sodium per container); and
  - Low-calorie beverages that are ≤ 40 calories per container.

Food Standards:
Provide an assortment of healthier food choices with more fruits, vegetables, whole grains, and fat-free/low-fat dairy products, and lower amounts of saturated and *trans* fats, added sugars, and sodium.

- **100% of snack foods (and side dishes) must meet all of the following criteria:**
    - No more than 200 calories per item as offered (per package).
    - No more than 35% calories from fat (which would be no more than 7 grams of fat for a 200 calorie snack, for example) with the exception of packages that contain 100% nuts or seeds; snack mixes that contain components other than nuts and seeds must have no more than 35% of calories from fat;
    - No more than 10% calories from saturated fat (which would be no more than 2 grams of saturated fat for a 200 calorie snack, for example) with the exception of packages that contain 100% nuts or seeds; snack mixes that contain components other than nuts and seeds must have no more than 10% of calories from saturated fat;
    - 0 grams *trans* fat;
    - No more than 35% of calories from total sugars and a maximum of no more than 10 grams of total sugars in the product, with the exception of fruits and vegetables that do not contain added sweeteners or fats; and with the exception of yogurt that contains no more than 30 grams of total sugars per 8-ounce container (and adjust proportionally for smaller containers);
    - No more than 200 mg of sodium per item as offered (per package/container); and
    - Each snack food item must contain at least one of the following: 1) a quarter cup of fruit, non-fried vegetable, or fat-free/low-fat dairy, or 2) 1 oz. of nuts or seeds or 1 Tbsp. of nut butter, or 3) at least 50% of the grain ingredients are whole grain (determined by the product having whole grain as the first ingredient, from the manufacturer, or if the product has a whole grain claim), or 4) at least 10% of the Daily Value of a naturally occurring nutrient of public health concern (calcium, potassium, vitamin D, or fiber).
    - Sugarless chewing gum can be sold without having to meet the above nutrition standards.

- **100% of entrée-type foods (e.g., sandwich, pizza, burger) must meet all of the following criteria:**
    - No more than 400 calories per item as offered (per package);
    - No more than 35% calories from fat (which would be no more than 15 grams of fat for a 400 calorie item, for example);
    - No more than 10% calories from saturated fat (which would be no more than 4 grams saturated fat for a 400 calorie entrée-type item, for example);
    - 0 grams *trans* fat;
    - No more than 35% of calories from total sugars and a maximum of no more than 15 grams of total sugars in the item;
    - No more than 480 mg of sodium per item as offered; and
    - Each food item must contain at least <u>two</u> of the following: 1) a quarter cup of fruit, non-fried vegetable, fat-free/low-fat dairy, or 2) 1 oz. of nuts or seeds or 1Tbsp. of nut butter, or 3) at least 50% of the grain ingredients are whole grain (determined by the product having whole grain as the first ingredient, from the manufacturer, or if the

product has a whole grain claim), or 4) at least 10% of the Daily Value of a naturally occurring nutrient of public health concern (calcium, potassium, vitamin D, or fiber)

Point of Purchase (POP) Calorie Labeling

- Each vending machine must display the total calorie content for each item as sold, clearly and conspicuously, adjacent or in close proximity to each individual item or its selection button, using a font and format that is at least as prominent, in size, appearance and contrast, as that used to post either the name or price of the item and where it can be seen before the consumer selects items (labeling should be consistent with federal law for calorie labeling of vending machines once in effect).

Tips for Successfully Implementing Vending Standards

- **Price** – beverages and foods that meet nutrition standards should be priced competitively (e.g., at or below) to similar items that do not meet the nutrition standards (if you chose a phased in approach).

- **Placement** – beverages and foods that meet nutrition standards should be as or more visible than similar items that do not meet the nutrition standards (for example, they should be closer to eye level).

- **Promotion** – promotional space on vending machines (e.g., sides and front panel), including but not limited to language and graphics, should promote only products that meet the nutrition standards.

- **Hold taste tests** – partner with vendors to offer taste testing of a variety of snack and beverage options that meet the nutrition standards. Have survey cards handy and tally up votes. Share results of taste testing and keep vending machines stocked with favorite items. Note: preferences may be location specific.

- **Administer online surveys** – provide online surveys in addition to or in lieu of in-person taste testing. Use online surveys as opportunities to promote healthy options in vending machines.

- **Provide education and promote program** – work with nutrition committee or health team to provide education to leadership and employees about the benefits of offering and choosing healthy foods and beverages. Use available methods to promote healthy options, cultivate support for the program, and promote educational events, taste testing, etc. Promotional methods might include posters, flyers, e-cards, emails to staff, newsletter articles, postings on bulletin boards, or signage near vending machines. Work with leadership from outset for strong buy-in and have leadership's message and signature on promotional materials and messages.

- **Announce to community** – share information with the public to increase acceptance of the program and make healthier snacking the norm. Share information with the public through press releases, social media, etc**.**

A Phased in Approach

Implementation Timeline:

- 100% of items in vending machines should meet the nutrition standards for beverages and foods. If this is not feasible to implement initially, then it is reasonable to use a phased-in approach as follows: ○ 50% of all items in vending machines will meet nutrition standards for beverages and foods within 1 year;
- ○ 75% of all items in vending machines will meet nutrition standards for beverages and foods within 2 years; and
- ○ 100% of all items in vending machines will meet nutrition standards for beverages and foods within 3 years.

Rationale for Healthier Foods and Beverages in Public Vending Machines

- Nutrition standards for foods and beverages found in vending machines can positively impact the eating habits of people working for and visiting government agencies, help shape social norms, and influence the practices and formulations of food companies.
- Through healthy vending policies, public agencies can provide healthy food and beverage options to many individuals, including employees and visitors to government parks and service agencies. For example, state and local governments employ 17 million people.
- Government agencies can be a model for healthy eating, reinforce other agency-sponsored obesity-prevention efforts, and show that healthy food tastes good and can generate revenue.
- Snack foods and sugary drinks are problems in Americans' diets. The top selling snacks include cookies, snack crackers, nuts, potato chips, tortilla chips, chocolate candy, and other candy. Sugary drinks are the number one source of calories in Americans' diets and contribute to obesity.
- More and more people are interested in healthier snack options. According to a 2010 study by the Snack Food Association, about 74% of consumers are trying to eat healthier, with about 65% eating specific foods to lose weight. Sales of healthier snacks are outpacing traditional snack foods by 4 to 1.
- Increasing healthier snack and beverage offerings is good for business. A study by the Hudson Institute found that companies that increased their healthier snack and

beverage portfolios between 2006 and 2011 enjoyed superior sales growth, operating profits, and operating profit growth.

- Nutrition standards ensure that foods and beverages sold in vending machines in government locations align with the Dietary Guidelines for Americans, the U.S. government's nutrition guidance for the nation.
- Offering foods and beverages that meet nutrition standards in vending machines located on government property is a promising, low-cost approach for supporting healthy eating and as part of a strategy to address obesity. It also could decrease the economic burden of obesity, which costs $150 billion a year – half of which is paid by taxpayers through Medicaid and Medicare.

For more information, contact any NANA member organization or Katie Bishop, M.S., M.P.H. at 1220 L Street, NW, Suite 300, Washington, DC 20005, Phone: 202-777-8351, FAX: 202-265-4952, E-mail: kbishop@cspinet.org.

Figure 3.1 NANA Vending Standards [2]

Other Vending Standards

When I initially joined the FHWC and started my field experience, the FHWC was using vending standards called "Fit Pick". In my opinion, I think that Fit Pick guidelines serve more as a base guideline rather than a set standard. For example, less than 35% fat is far too unspecific to be considered a viable standard. After all, the Fit Pick standards do not specify which types of fat should be included, in the 35% limit. The Fit Pick standards could enable foods with *trans* fats to be inclusive into their 35% fat limit with such lax standards. Also, not all saturated fats are created equal, especially when considering coconut saturated fats which are

Figure 3.2 Fit Pick Vending Standards [4]

medium-chain triglycerides (MCTs). It has been documented that coconut oil can be implemented in a weight loss regiment that reduces adipose tissue despite being a saturated fat [21]. The Fit Pick sugar requirements—like many other vending standards—do not include natural sugars like fruit. The Fit Pick guidelines are better than none, but they did not suffice for the individuals of the Flint Hills Wellness Coalition.

Still, Why Healthy Vending?

This question sometimes plagued my efforts, but I never faltered from attainment of our original goal. Sometimes during our efforts I would become discouraged because the number of vending machine customers is not necessarily vast, but many of the customers that do use the machines are regular users. I believe that if a single person benefits from the implementations we induced, than our efforts were not in vain. My field experience helped me to understand that small changes can cause large long-term shifts in behavior and policy.

From the sodium content of foods to the chemical additives, there are countless reasons for healthy vending as a component of promoting healthy diets. The average American 2 years of age or older consumes over 3,400 mgs of sodium a day according to the CDC Sodium Fact Sheet. Excess sodium intake contributes to increased risk for cardiovascular disease and increased blood pressure (hypertension). Reduced sodium intake would not only provide cardiovascular benefits, but it would also reduce chances of being afflicted from reduced bone mass or esophageal cancer [5].

Added sweeteners pose more of a threat than many realize. Too often Americans get caught up in the taste of things rather than the health disparities in consumable items. People eat and drink items with artificial sweeteners in them to avoid excess calorie consumption to lose

weight, but often it is counterintuitive to their original goal! Artificial sweeteners have been scientifically documented to not only provide no satiation to the consumer, but in fact cause the consumer to become hungrier and often eat more than they would otherwise. Scientific findings have led to increasingly supportive data indicating that the food reward pathway is not signaled with consuming drinks with artificial sweeteners in them, especially with respect to aspartame [(23)]. Added sweeteners have been accused of additional detriments to human health, such as increased risk for diabetes, increased cancer risk, and increased risk of developing other chronic diseases, but these accusations require additional research and may be inconclusive currently.

Trans fats are hidden in countless foods. For example, a Snickers Bar may claim 0g *trans* fats in their nutritional label, but the FDA enables any amount of *trans* fats below 0.5 grams to not be labeled according to their Federal Food, Drug, and Cosmetic Act (FD&C Act) [(20)]. A 2% increase in absolute energy intake of *trans* fats was synonymous with a 23% increase in cardiovascular risk [(20)]. As most individuals interested in health know, *trans* fats have been suggested to reduce HDL cholesterol (good cholesterol) and increase LDL cholesterol (bad cholesterol), and the data is rather conclusive and documented by many research papers [(20)]. Gram for gram, consuming *trans* fats compared to saturated fats puts you at a 15 times greater risk for heart disease [(20)]. *Trans* fats are undoubtedly one contributor to the overweight and obesity endemic. It is important to note that the healthiest shift from *trans* fats should be towards polyunsaturated and monounsaturated fatty acids, and not towards saturated fats.

Taste Testing Session

Mrs. Barnard, Katy Oesteman, Cathy Harmes, and I all agreed it would be beneficial to have a test group for the potential implementations into the vending machines of the City of

Manhattan. This taste testing session was conducted as a route to ascertain an approval rating for the foods in question. A lunch and learn presentation was given once a week for an entire month and during that time we finalized the new vending foods and were able to conduct a taste testing survey on the last day of the lessons. Below is the taste testing survey template and the results documented.

Taste Testing Food Ranking

Healthier Vending Machine Options	**Awful and Disgusting**	**Not Good**	**Okay**	**Tasty**	**Amazing**	**No Opinion**
Annie's Cheddar Bunnies	1	2	3	4	5	N/A
Annie's Bunny Grahams (Honey)	1	2	3	4	5	N/A
Annie's Bunny Grahams (Chocolate Chip)	1	2	3	4	5	N/A
Blue Diamond Whole Natural Almonds	1	2	3	4	5	N/A
Dry Roasted Edamame	1	2	3	4	5	N/A
GoGo Squeez Applesauce	1	2	3	4	5	N/A
Pop Chips (Barbecue)	1	2	3	4	5	N/A
Sunflower Kernels.	1	2	3	4	5	N/A

Trail Mix (Fruit and Nut)	1	2	3	4	5	N/A
Z Bar	1	2	3	4	5	N/A

Table 3.1 Taste Testing Survey Template

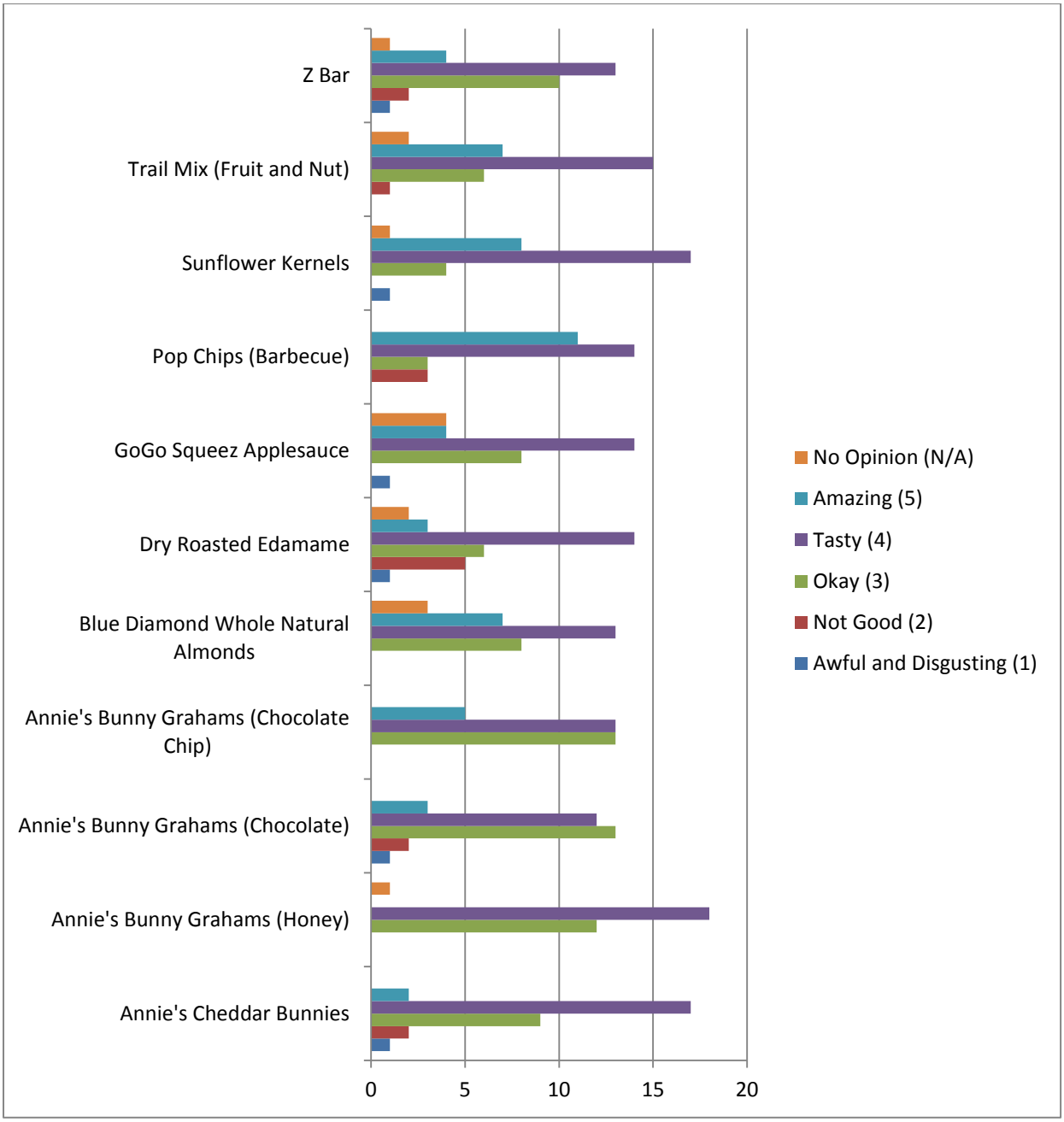


Figure 3.3 Taste Testing Survey Results

Taste Testing Food Ranking

Healthier Vending Machine Options	Awful and Disgusting	Not Good	Okay	Tasty	Amazing	No Opinion
Annie's Cheddar Bunnies [71%]	1	2	9	17	2	
Annie's Bunny Grahams (Honey) [72%]			12	18		1
Annie's Bunny Grahams (Chocolate) [69%]	1	2	13	12	3	
Annie's Bunny Grahams (Chocolate Chip) [75%]			13	13	5	
Blue Diamond Whole Natural Almonds [79%]			8	13	7	3
Dry Roasted Edamame [69%]	1	5	6	14	3	2
GoGo Squeez Applesauce [75%]	1		8	14	4	4
Pop Chips (Barbecue) [81%]		3	3	14	11	
Sunflower Kernels [81%]	1		4	17	8	1

Trail Mix (Fruit and Nut) [79%]		1	6	15	7	2
Z Bar [71%]	1	2	10	13	4	1

Table 3.2 Taste Testing Survey Results and Approval Rating (31 participants)

After totaling the results and extrapolating the data, I orchestrated a meeting between the prime individuals associated with the healthy vending initiative including the following members: Terry Francis, with Five Star Vending; Ginny Barnard, with Research and Extension; Katy Oesteman, health educator for the Riley County Health Department; Cathy Harmes, director of the Department of Human Resources of Manhattan City Hall; and myself an MPH student. During this meeting we discussed base prices paid per food unit (despite bulk purchases) and the markups necessary for Five Star Vending to maintain profits. In conclusion, we decided on which foods to implement into the testing area—Manhattan City Hall.

Results

As state previously, the implementation of NANA standard foods only took place in the vending machine at Manhattan City Hall. Terry, from Five Star Vending, sent me the sales report for the vending machine. The sales data was analyzed from the 1st of April till the 10th of March. I think it is imperative that the items sold be implicated on a smaller scale than they normally would be, because these items were only put into a single machine. Given those circumstances, the amount of items sold can be interpreted to be significant. The Annie's Bunny Grahams,

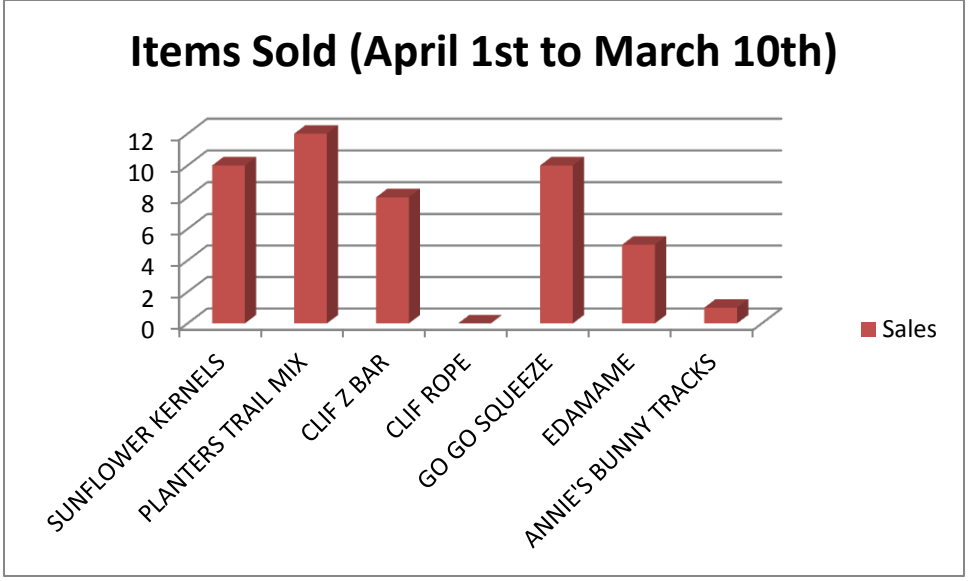


Figure 3.4 – Sales Data for Healthier Vending Options

however, did not do well surprisingly. The mean amount of all purchases was about 11 per item type. Majority of the healthy vending options did not live up to that machine average, but they are a new implementation and have not been in the machine for a significant testing period. Further testing and analyzing is necessary, and I believe additional testing sites would strengthen the healthy vending testing period substantially.

Core Competencies Fulfilled

The core competencies of my MPH education were fulfilled in many different areas throughout my field experience. My capstone project required me to make many surveys and document a significant amount of data graphically. In fact, one of the first projects of my field experience was to design the graphs for the Healthy Little Apple Coalition (HLAC) of Riley County Perception Survey. The HLAC committee title was changed to the Flint Hills Wellness Coalition shortly after this survey was conducted. In this survey, and others we conducted like it, epidemiological and biostatistical competencies were fulfilled. The Epidemiology competency was accomplished by measuring the dietary trends of individuals by preferences and documented eating habits, as well as comprehending the appropriate boundaries of the survey questions and the dissemination of the information attained by them. Biostatistics was probably

one of the most frequent themes of my field experience due to the immense amount of surveys and graphical analysis required.

The previously listed example of gardening and harvesting could potentially involve many of the core and emphasis MPH requirements. Environmental toxicology may be involved if we used pesticides in the garden (we did not) or if some individual decided to contaminate our harvest with a potential toxicant. Social and behavioral sciences are concerned when harvesting the vegetables, because many kids in the U.S. are accustomed to eating primarily processed foods and may in turn, view us indignantly for offering them such "bland" food [(3)]. Epidemiology is not really a concern unless the children were unfortunate enough to derive a sickness from the garden, like E. coli and salmonella infections.

Additional Knowledge Acquired

In addition to the normal activities of my field experience, I was given time to do independent research into nutritional and toxicological effects in the United States population. This research was imperative for me to provide the necessary understanding of food effects on individuals. This evidence-based research background helped enable me to provide a proper analysis of the standards we were abiding by and how we could make them better. The areas of research included many different types of chemical compounds, such as: natural and synthesized additives and preservatives, like BHT; partially hydrogenated oils (PHOs); artificial colorings; and artificial sweeteners. I also read into the overwhelming controversy behind GMO introduction and its rapid integration and domination in the national food supply. I am interested to see if the FDA eventually mandates companies to label foods as GMO.

Personal Recommendations

Healthy vending is a small step in making our community healthier as a whole. With that being said, just because it is small it does not make unwarranted. Healthy vending gives the opportunity for education as well as healthful benefits. These healthy snacks provide some physiological significance to the human body rather than just being empty calories to binge upon. I believe policy intervention would make the healthy vending initiative mandatory, which could provide numerous benefits. Having healthier snacks available would encourage individuals to experiment and test the products.

Despite the opposition against government intervention, certain policies would not hinder current behaviors if that is undesired by individuals. A policy implementation mandating at least 25% of the nation's vending machines to possess healthy snack options would not impede current trends, but support the choice for change instead. The mandate would make healthy options available to those that are health conscious and be conducive to changing the habits of those individuals who do not eat healthy, and are potentially suffering from that decision. The proposed percentage is modest at most and should be taken into consideration as a small step towards a healthier nation.

Conclusion

The knowledge I attained from the MPH program requirements and electives has changed the man I am, and made me into a person I am more grateful to be. It has also helped me strive for more knowledge daily and work more independently than ever before. I would like to thank everyone who was involved with my MPH endeavor once again. The healthy vending initiative, in all honesty, has just begun. Much more work is going to be done despite my absence, and I

wish the most successful future for those continuing to influence the healthy vending initiative. The Flint Hills Wellness Coalition, the Riley County Health Department, Kansas State Research and Extension, Kansas State University, and Manhattan City Hall have all been extremely influential in the project thus far. I know in my stead they will continue to pursue the healthy vending and concession endeavor relentlessly.

If I could take away one lesson from my field experience, it would be the necessity of collaboration. Without our different organizations coming together through the Flint Hills Wellness Coalition, I doubt anything would have been done. My MPH field experience has shown me that collaboration is integral in making any health impact nationwide or within a community. I know the lessons I have learned will benefit me greatly in my future career, wherever it takes me.

References

[(1)]Bell, C., Pond, N., Davies, L., Francis, J., Campbell, E., & Wiggers, J. (2013). Healthier choices in an australian health service: A pre-post audit of an intervention to improve the nutritional value of foods and drinks in vending machines and food outlets. *BMC Health Services Research, 13*(1), 492. Retrieved from http://www.biomedcentral.com/1472-6963/13/492

[(2)]Bishop, K. (January 2014). Model beverage and food vending machine standards. [NANA Model Vending Standards] *National Alliance for Nutrition & Activity,*

[3]Boyd, B. (2008, Summer 2008). Fast food and the family farm. *Stanford Social Innovation Review, 6*, 21-22. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/217171300?accountid=11789

[4]Bradshaw, J. *National automatic merchandising association.* Retrieved February 5http://www.vending.org/index.php/about-us

[5]*Centers for disease control and prevention. National center for chronic disease prevention and health promotion. sodium fact sheet.* (2013). Retrieved March 3, 2014, from http://www.cdc.gov/salt/pdfs/Sodium_Fact_Sheet.pdf

[6]*FDA targets trans fat in processed foods.* (2014). Retrieved February 6, 2014, from http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm372915.htm#pho

[7]Higdon, J. (2009). *Soy isoflavones.* Retrieved March 5, 2014, from http://lpi.oregonstate.edu/infocenter/phytochemicals/soyiso/

[8]*Human resources.* (2014). Retrieved February 1, 2014, from http://www.ci.manhattan.ks.us/index.aspx?NID=8

[9]Kane, J. (2012, Health costs: How the U.S. compares with other countries. *Pbs*,

[10]Kasimanickam, R. (August 2010). *Bovine respiratory disease "shipping fever" in cattle.* Retrieved February 5, 2014, from http://extension.wsu.edu/vetextension/Documents/Spotlights/BovineRespiratoryDisease_Aug2010.pdf

[11]*K-state research and extension.* (2014). Retrieved February 1, 2014, from http://www.riley.ksu.edu/p.aspx?tabid=192

[12]Lafontant, C., & Bogue, K. (2006). *Healthy vending machine policy county of san diego department of parks and recreation.* Retrieved February 5, 2014, from http://www.publichealthadvocacy.org/PDFs/01_San%20Diego%20Parks%20and%20Rec%20Vending%20Fact%20Sheet_FINAL.pdf

[13]Lobstein, T., & Davies, S. (2009). Defining and labelling 'healthy' and 'unhealthy' food. *Public Health Nutrition, 12*(03), 331-340. doi:10.1017/S1368980008002541

[14]Lobstein, T., & Jackson-Leach, R. (0918). *Child overweight and obesity in the USA: Prevalence rates according to IOTF definitions* Retrieved from 2007 database.

[15]A long and healthy life. (2010). *American human development project: The measure of america 2010-2011: Mapping risks and resilience*. New York University Press.

[16]Mid-America Coalition on Health Care and Johnson County Department of Health and Environment. (September 2012). Healthy vending in the workplace. *Working Well in Johnson County*,

[17]Middleton E Jr, Kandaswami C, Theoharides TC. The effects of plant flavonoids on mammalian cells: Implications for inflammation, heart disease, and cancer. *Pharmacol Rev. 2000 Dec;52(4):673-751. PubMed PMID: 11121513.*,

[18]Miller, J., Lee, A., Obersky, N., & Edwards, R. (2014). Implementation of A better choice healthy food and drink supply strategy for staff and visitors in government-owned health

facilities in queensland, australia. *Public Health Nutrition*, *FirstView*, 1-8. doi:10.1017/S1368980013003455

[19]Office of Information Services. (January 11, 2013). *Leading causes of death.* Retrieved February 20, 2014, from http://www.cdc.gov/nchs/fastats/lcod.htm

[20]Remig, V., Franklin, B. F., Margolis, S. F., Kostas, G. F., Nece T FAU - Street, James,C., & Street, J. C. (0401). *Trans fats in america: A review of their use, consumption, health implications, and regulation* Retrieved from 2010 Apr database.

[21]St-Onge, M. P., & Bosarge, A. (0415). *Weight-loss diet that includes consumption of medium-chain triacylglycerol oil leads to a greater rate of weight and fat mass loss than does olive oil* Retrieved from 2008 Mar database.

[22]van, d. B., Mikolajczak, J., & Bemelmans, W. (2013). Changes in school environment, awareness and actions regarding overweight prevention among dutch secondary schools between 2006-2007 and 2010-2011. *BMC Public Health*, *13*(1), 672. Retrieved from http://www.biomedcentral.com/1471-2458/13/672

[23]Yang, Q. Gain weight by "going diet?" artificial sweeteners and the neurobiology of sugar cravings: Neuroscience 2010. yale J. biol. med. 2010;83:101–108. [PMC free article

[24]*JOCO theatre-goers SCORE! with healthy concessions.* (2014). Retrieved March 25, 2014, from http://www.kchealthykids.org/Healthy-Eating/JOCO-SCORE