

Traffic Light System Approach to Identifying Healthy Choices in Retail-Dining Facilities at a Historically Black University

Heather L Colleran^{1*}, Alexis Sharkey¹, Roberta Claro da Silva¹ and Tiffany Fuller²

¹Department of Family and Consumer Sciences, North Carolina Agricultural and Technical State University, Greensboro, USA.

²Department of Human Performance and Leisure Studies, North Carolina Agricultural and Technical State University, Greensboro, USA.

*Correspondence:

Dr. Heather L Colleran, Assistant Professor in Food and Nutritional Sciences, Department of Family and Consumer Sciences at North Carolina Agricultural and Technical State University, US, Tel: 336.285.3627.

Received: 06 March 2019; Accepted: 27 March 2019

Citation: Heather L Colleran, Alexis Sharkey, Roberta Claro da Silva, et al. Traffic Light System Approach to Identifying Healthy Choices in Retail-Dining Facilities at a Historically Black University. Food Sci Nutr Res. 2019; 2(1): 1-5.

ABSTRACT

Application of a simple menu labelling system may appeal to decision-making skills of college students, thereby improving their food choices and thus promoting healthy lifestyle behaviors. Therefore, the purpose of this project was to analyse menus on a Historically Black University campus to create a handout of healthy menu options for students. Nutritional information from the six retail-dining facilities were colored coded based on a percentage of energy from total fat (green <30%; amber 30-40%; red >40%). Results showed less than 25% of menu items were green, primarily condiments, resulting in increasing the criteria to <35% kcal total fat for purposes of the handout. The application of a simplified traffic light system to analyse the menus from the six-retail dining facilities demonstrated that students have less variety and choices when it comes to the selection of healthful menu items. The handout will be used for future studies.

Keywords

Obesity, Traffic light system, Healthful choices, College students, Campus dining.

Introduction

In the United States (U.S.), the prevalence of obesity continues to increase [1]. Obesity defined as a body mass index (BMI) of greater than 30 kg/m². From 2011-2014, the obesity rate in U.S. adults was 36.4%, and of that, 48.0% were non-Hispanic blacks. Additionally, the obesity prevalence rate for non-Hispanic black youth ages 12-19 years was 22.6%.

African American college students are at an increased risk of obesity due to familial factors (i.e., family health history and socioeconomic status) [2]. There is a paucity of research on the weight status of students attending HBCU's. In a recent study, 47.5% of African American students were considered either overweight or obese with about 25% of which are obese [3]. Compared to the American College Health Association (ACHA) National College Health Assessment, which included 52 post-secondary institutions (excluded HBCU's) in fall 2017 [4], less than 38% of college students reported being either overweight or

obese and less than 15% as obese [5].

The effects of unhealthful dietary consumption and low-level physical activity habits on the impact of weight gain among college students are widely acknowledged [6,7]. The shift from living at home to living independently, such as the transition from high school to college, can pose significant challenges to healthful eating [8]. Additionally, college students often report difficulty in acquiring food, with the affordability of food, lack of knowledge of meal preparation and time management, including meal times. A study of 764 students (mean BMI 22.7 kgm⁻², normal weight classification) found that 70% of freshmen reported eating less than five servings of fruit and vegetables per day, and close to half ate fried or high-fat foods at least three times a week [9]. Similarly, a survey of 117 universities conducted by the American College Health Association reported only about 4.6% of their students ate the recommended five servings daily of fruit and vegetables [4].

Early adoption of a healthy lifestyle is a good predictor of success and good health in adulthood. Unfortunately, positive health habits (e.g., healthy eating patterns and physical activity) of undergraduate college students frequently fall far short of public

health recommendations [5,9,10]. Current public health approaches to combat the obesity epidemic include, but not limited to, taxation on high energy dense food and beverages, reduction in the marketing of unhealthy food to children, lifestyle interventions (e.g., bariatric surgery, diabetes prevention, pharmacology) and traffic-light nutrition labelling [11].

Efforts to help students manage their calorie intake have included a wide variety of strategies including nutrition education, food intake monitoring, labelling nutritional content of foods, promotion of healthy food choices, and social media appeals to eat foods from “recommended” food groups [12,13]. While these efforts have had some success, their lack of total success is due in part to the insufficient attention paid to the contextual environment in which students make food choices and decisions of when and how much to eat.

One way to improve food choices of college students and promote healthy lifestyle behaviors is to appeal their decision-making skills [12]. The Traffic Light System (TLS) is a labelling method that nutritionally rates menu items as a whole (i.e., energy) or as individual nutrients (i.e., fat, saturated fat, sodium) within the food using traffic light colors (i.e., green, amber, red). Green refers to healthier choices, amber is okay but use caution, and red is less healthy and should be limited. Point of purchase interventions using systems such as the TLS food labelling has been shown to be effective in increasing healthy food choices within cafeterias [14]. In another study, TLS was used to effectively reduce intake of calories, total and saturated fat, and sodium [15]. In general, studies using the TLS to identify healthier menu items in cafeterias or on menus have shown effectiveness in promoting healthful eating [16].

Purpose

Therefore, the purpose of this project was to apply the TLS to retail-dining facilities menus at a South Eastern HBU in order to create a handout of healthier menu options for students to promote healthier food choices.

Methods

We sourced the menus from six retail-dining facilities on a South Eastern HBU campus during the 2016-2017 academic year. The nutritional information for the six-retail dining facilities was obtained from the dining facilities website and entered into a spreadsheet for analysis. The spreadsheet captured the following information: menu item, serving size, energy (calories), fat (grams), saturated fat (grams), protein (grams), carbohydrate (grams), and sodium (milligrams). Percentile columns were then created to calculate the percentage of energy from fat, saturated fat, protein and carbohydrates. A simplified TLS application was used to color code menu items based off of the percentage of energy from fat. The following cut-off points were identified based on United States Department of Agriculture Dietary Guidelines for Americans 2015-2020 to categorise menu items: “green” (<30%), “amber” (30-40%) and “red” (>40%) [17].

Analyzing and Evaluation of Data

Descriptive data were used to determine the number of menu items from each restaurant identified as “green,” “amber” and “red.” Data reported as percentages (TLS category divided by total menu items multiplied by 100). Menu items categorized as “green” and “amber” were then used to create a handout for faculty, staff, and students. Results below are for the menu analysis and handout creation.

Results

There is a total of six retail-dining facilities located on the HBU campus studied. Only five of the six locations offered nutritional information on their website associated with their menus. Nutritional information was not available for the sixth retail-dining facility. For purposes of creation of the handout for the students on the HBU campus, we included all six retail-dining facilities. Five of the six retail-dining facilities were analysed using the TLS system; the sixth retail-dining facility recommendations were based off general nutrition knowledge from a restaurant that prepared similar menu items (Figure 1).

The majority of the locations offered at least one “green” food, but the majority of the options available were considered “red” foods (Figure 2). Overall, among the six retail-dining facilities 22.75% of the menu items were considered “green” foods, 9% “amber” foods, and 69% “red” foods (Figure 3). As displayed in the results from the figures for five of the six retail-dining locations, the majority of the menu items available to students were considered “red” foods or have > 40% energy coming from total fat. The “green” foods at some retail-dining locations only included merely condiments and sauces. Due to this deficit, “amber” foods up to 35% energy from fat were included on the handout to include food options available at all retail-dining facilities (Figure 4).

Discussion

The application of a simplified TLS to analyse the menus from the six-retail dining facilities at a South Eastern HBU demonstrated that students have less variety and choices when it comes to the selection of healthful menu items. Over two-thirds of the menu items available were coded “red,” indicating that total fat provided over 40% of the total energy and less than one-third of the menu-items were coded “green” or “amber.” The findings were similar to other college campuses, which showed 12% of entrees and 36% of entrée salads as healthful [18]. In another study, approximately 50% of students routinely purchased food from on-campus dining facilities at least three times per week, resulting in higher dietary fat and added sugar consumption [19]. The findings indicate a lack of healthful food options on campus or a lack of knowledge of healthier food choices [20].

Although studies have been conducted on college campuses addressing the foods choices of college students, research that addresses increasing awareness of healthy food choices on an HBCU college campus is limited. Traditionally one of three approaches (environmental, in-person, online) to increase awareness of healthful food choices on college campuses have been employed

Menu Items	Serving Size	Cal	Fat (g)	Saturated Fat (g)	Pro (g)	Carbs (g)	Fiber (g)	Sodium (mg)	Cal	%Fat	%Sat Fat	%Pro	%CHO	Sodium
Turkey Sub on Wheat	1	450	21	7	24	41	5	1390	450	42%	14%	21%	36%	1390
Turkey Sub on White	1	456	22	7	23	43	2	1470	456	43%	14%	20%	38%	1470
Buffalo Ranch Chicken Sub on Wheat	1	593	28	7	28	37	6	1630	593	42%	11%	19%	38%	1630
Buffalo Ranch Chicken Sub on White	1	599	28	7	27	39	3	1710	599	42%	11%	18%	39%	1710
Bag Chicken Sub on Wheat	1	654	41	13	30	42	5	1210	654	50%	18%	18%	26%	1210
Bag Chicken Sub on White	1	660	41	8	29	45	3	1290	660	50%	13%	18%	27%	1290
BBQ Crispy Chicken Sub on White	1	542	23	8	24	62	6	1430	542	38%	13%	18%	46%	1430
BBQ Crispy Chicken Sub on Wheat	1	542	23	8	24	61	6	1430	542	38%	13%	18%	45%	1430
Meatball Sub on Wheat	1	729	44	21	36	31	6	1620	729	54%	26%	20%	28%	1620
Meatball Sub on White	1	735	44	21	35	33	3	1690	735	54%	26%	19%	29%	1690
Chicken Parmesan Sub on Wheat	1	530	23	7	25	55	5	1120	530	39%	12%	19%	42%	1120
Chicken Parmesan Sub on White	1	536	23	7	24	57	2	1190	536	39%	12%	18%	43%	1190
BLT on Wheat	1	484	27	9	19	41	5	1210	484	50%	17%	16%	34%	1210
BLT on White	1	490	27	9	18	43	2	1280	490	50%	17%	15%	35%	1280
Au Jus	1	2	0	0	0	0	0	245	2	0%	0%	0%	0%	245
Brown mustard (1 tsp.)	1	5	0	0	0	0	0	68	5	0%	0%	0%	0%	68
Kara's Tablada Caesar dressing	1	70	8	3	1	1	0	240	70	103%	39%	6%	6%	340
Kara's Cannonball BBQ Sauce	1	25	0	0	0	6	0	115	25	0%	0%	0%	96%	115
Crook Mayo	1	63	7	1	0	0	0	36	63	100%	14%	0%	0%	36
Kara's Dijon Horseradish	1	70	7	1	0	3	0	140	70	90%	13%	0%	17%	140
Horseradish Cream Sauce	1	45	5	1	0	1	0	144	45	100%	20%	0%	9%	144
Mayonnaise	1	99	11	2	0	0	0	78	99	100%	18%	0%	0%	78
Olive oil	1	119	14	2	0	0	0	0	119	106%	15%	0%	0%	0
Kara's Oriental sesame dressing	1	45	3	0	0	6	0	160	45	60%	0%	0%	53%	160
Kara's Honeydew Ranch dressing	1	50	6	1	0	0	0	145	50	108%	18%	0%	0%	145
Southwest Mayo	1	99	11	2	0	0	0	120	99	100%	18%	0%	0%	120
Kara's Men Forest	1	64	7	1	0	1	0	87	64	38%	14%	0%	6%	87
Red Wine Vinaigrette	1	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0
Buffalo Chicken Salad	1	543	39	7	20	33	5	3240	543	64%	12%	15%	23%	3240
Chicken BLT Salad	1	669	43	11	38	31	3	1540	669	58%	15%	23%	19%	1540
Grilled Chicken Caesar Salad	1	765	54	10	23	36	4	1520	765	64%	12%	13%	19%	1520
Vegetarian Sub on Wheat	1	501	27	7	17	49	9	1120	501	49%	13%	14%	39%	1120
Vegetarian Sub on White	1	507	27	7	16	51	6	1190	507	48%	12%	13%	40%	1190

Figure 1: Traffic Light System analysis example of one retail-dining facility at a Historically Black University.

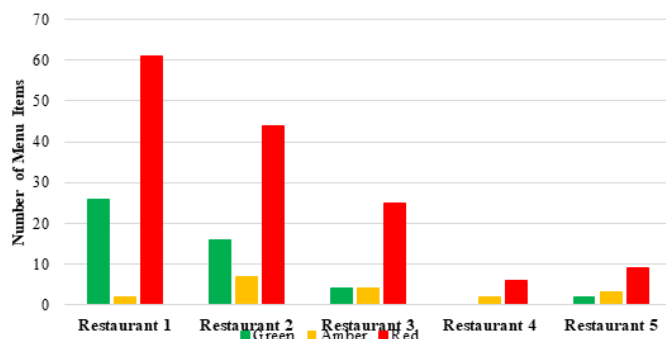


Figure 2: TLS analysis of menu Items in the five retail-dining facilities at a Historically Black University.

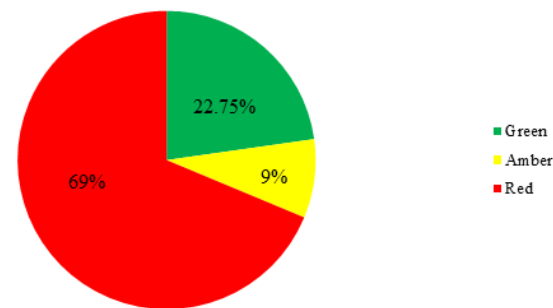


Figure 3: Traffic Light System analysis of menu items of all restaurant menus at retail-dining facilities at a Historically Black University.

Healthy Choices in Retail-Dining Facilities at a HBU

For your beverage, always choose water!
Keep yourself hydrated!

1

Club Sandwiches: Grilled Chicken Club
Hot Sandwiches: The Big Nasty*, French Dip, Memphis
Salads: Savannah Chopped Salad
• Top with Fat-free Chipotle Peach dressing or Lite Ranch Dressing
Soups: Chicken & Dumplings, Chicken & Sausage Gumbo, Chicken Noodle, Fire Roasted Vegetable, Southwest Roasted Corn, Veggie Chili (Choose from Cup, Bowl, or Bread)
Classic Sandwiches: All Deli Classics
Spuds (Any): Bacon*, Black Angus Roast Beef*, Cheese*, Grilled Chicken*, Spud Max*, Spud Ole*
Grilled Sandwiches: Sweet Chipotle Chicken*
Sides: Applesauce, Fruit Cup
*Good "Choose 2" option

2

Limit fancy drinks, enjoy a simple cup of coffee!
Bakery: Bagels (Plain, Everything w/ Cheese, Multigrain, Chonga, 8-Grain), Marshmallow Dream Bar, Reduced-Fat Banana Chocolate Chip Coffee Cake, Chewy Chocolate Meringue Cookie, Reduced-Fat Cinnamon Swirl Coffee Cake, Reduced-Fat Very Berry Coffee Cake, Cinnamon Roll
Bistro Boxes: Chicken & Hummus
Hot Breakfast: Oatmeal, Turkey Bacon & White Cheddar Classic Breakfast Sandwich
Sandwiches, Panini & Wrap: Chicken Santa Fe Panini, Ham & Swiss Panini, Tarragon Chicken Salad Sandwich
Yogurt & Fruit: Peach Raspberry Yogurt Parfait, Seasonal Harvest Fruit Blend, Strawberry Blueberry Yogurt Parfait

3

Options for Ordering a 6" Healthy Sub:
1. Choose any bread
2. Meat: Grilled Chicken, Roasted Chicken, Ham, Turkey, Veggie, Deli Club, Chicken Caesar
3. Add Any Cheese
4. Add: Banana Peppers, Cucumbers, Green Peppers, Jalapeno Peppers, Lettuce, Olives, Onions, Pickles, Spinach, Tomato
5. Add Condiments/Extras: Brown Mustard, BBQ, Mayo, Olive Oil, Vinegar, Caesar, Ranch
6. Choose a side of fruit

6

Smoothies
1. Pick your fruits and/or vegetables
2. Add non-fat yogurt or ice cream
3. ENJOY!
Wings
Baked wings with no sauce, in moderation
Sides: Pasta Salad
Go for a delicious smoothie

4

- Meaty Marinara pasta and Cheese pizza is okay, in moderation
- SKIP the cheese sticks, breadsticks, wings, and cinnamon sticks

5

Grilled Chicken Sandwich & Grilled Market Salad
Sauces: Buffalo, Fat-Free Honey-Mustard & Dressing.

Figure 4: Application of the Traffic Light System applied to a handout for faculty, staff and students identifying healthy choices at retail-dining facilities at a Historically Black University.

[13]. There is a lack of research to support one approach over another. For this study, we focused on the environmental approach to creating a handout for future interventions that would include the other two approaches, both in-person and online nutrition education. Lastly, a combination of the approaches may be the best method to improve the dietary habits of college students.

Regarding environmental approaches specifically food labelling (e.g. guideline daily amount, point of purchase and TLS), the TLS has been shown to be the most effective approach to increase consumer awareness of healthful food choices [21-24]. Traffic light labels on menu items were more likely to be utilised when compared to total energy provided and percent daily intake [23]. Furthermore, color coding helps to simplify decision making when it comes to food choices [25].

Increasing the awareness of the healthy menu items through the creation of an easy to read handout may help the improvement of food choices on college campuses. In a recent study, TLS labels applied to menu items served in a college cafeteria [26]. Seventy-five percent of the students reported the traffic light labels were helpful in making food choices. Lastly, students expressed the need for a nutrition labelling system, such as the TLS, on college dining menus [27].

The criteria used for the project was limited to only applying a traffic light system based on a percentage of total fat contributing to energy for menu items served at the five-retail dining facilities. The sixth dining-facility did not provide nutritional content of menu items served on campus. Therefore, we used a comparable nutritional analysis to make recommendations for the handout. Another limitation was the menu from the cafeteria was not analysed due to the weekly rotation of the menu. Finally, we did not test the handout for effectiveness in improving students' food choices within the retail-dining facilities. Future studies will look into testing the effectiveness of aiding students to make healthier food choices at the six retail-dining facilities.

Conclusion

College provides unique opportunities for dietary interventions since students are living within an atmosphere where learning occurs and behaviors are still mutable. The application of the TLS to college dining menus provides a simple method to identify healthful foods on campus. Lastly, the application of the TLS may help improve the nutritional quality of food offerings on campus as well as improve students' dietary habits. Future research projects will focus on increasing awareness and sales of healthy choices on an HBCU campus and students' nutrition knowledge.

References

- Hyattsville MD. National Center for Health Statistics (NCHS) Health, United States, 2016: With Chartbook on Long-term Trends in Health; National Center for Health Statistics: Hyattsville, MD. 2017: 239-244.
- Gary TL, Gross SM, Browne DC, et al. The College Health and Wellness Study: baseline correlates of overweight among African Americans. *Journal of Urban Health: Bulletin of The New York Academy of Medicine*. 2006; 83: 253-265.
- Sa J, Heimdal J, Sbrocco T, et al. Overweight and Physical Inactivity Among African American Students at a Historically Black University. *Journal of The National Medical Association*. 2016; 108: 77-85.
- American College Health Association (ACHA). American College Health Association-National College Health Assessment II: Reference Group Executive Summary Fall 2017; American College Health Association: Hanover, MD, 2018.
- American College Health Association (ACHA). American College Health Association-National College Health Assessment II: Reference Group Undergraduates Executive Summary Fall 2017; American College Health Association: Hanover, MD. 2018; 13.
- Holm-Denoma JM, Joiner TE, Vohs KD, et al. The "freshman fifteen" (the "freshman five" actually): predictors and possible explanations. *Health psychology: Official Journal of The Division of Health Psychology, American Psychological Association*. 2008; 27: 3-9.
- Vella-Zarb RA, Elgar FJ. The 'freshman 5': A meta-analysis of weight gain in the freshman year of college. *Journal of American College Health*. 2009; 58: 161-166.
- Cluskey M, Grobe D. College weight gain and behavior transitions: Male and female differences. *Journal of the American Dietetic Association*. 2009; 109: 325-329.
- Racette SB, Deusinger SS, Strube MJ, et al. Weight changes, exercise, and dietary patterns during freshman and sophomore years of college. *Journal of American College Health*. 2005; 53: 245-251.
- Wald A, Muennig PA, O'Connell KA, et al. Associations between healthy lifestyle behaviors and academic performance in U.S. undergraduates: A secondary analysis of the American College Health Association's National College Health Assessment II. *American Journal of Health Promotion*. 2014; 28: 298-305.
- Lagerros YT, Rossner S. Obesity management: What brings success? *Therapeutic Advances in Gastroenterology*. 2013; 6: 77-88.
- Deliens T, Van Crombruggen R, Verbruggen S, et al. Dietary interventions among university students: A systematic review. *Appetite*. 2016; 105: 14-26.
- Kelly NR, Mazzeo SE, Bean MK. Systematic review of dietary interventions with college students: Directions for future research and practice. *Journal of Nutrition Education and Behavior*. 2013; 45: 304-313.
- Sonnenberg L, Gelsomin E, Levy DE, et al. A traffic light food labeling intervention increases consumer awareness of health and healthy choices at the point-of-purchase. *Preventive Medicine*. 2013; 57: 253-257.
- Emrich TE, Qi Y, Lou WY. Traffic-light labels could reduce population intakes of calories, total fat, saturated fat, and sodium. *PloS One*. 2017; 12: e0171188.
- Fernandes AC, Oliveira RC, Proenca RP, et al. Influence of menu labeling on food choices in real-life settings: A

- systematic review. *Nutrition Reviews*. 2016; 74: 534-548.
17. U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015-2020 Dietary Guidelines for Americans. 8th Edn. 2015.
 18. Tseng M, DeGreef K, Fishler M, et al. Assessment of a university campus food environment, California, 2015. *Preventing Chronic Disease*. 2016; 13: 18.
 19. Pelletier JE, Laska MN. Campus food and beverage purchases are associated with indicators of diet quality in college students living off campus. *American Journal of Health Promotion*. 2013; 28: 80-87.
 20. Peterson S, Duncan DP, Null DB, et al. Positive changes in perceptions and selections of healthful foods by college students after a short-term point-of-selection intervention at a dining hall. *Journal of American College Health*. 2010; 58: 425-431.
 21. Cecchini M, Warin L. Impact of food labelling systems on food choices and eating behaviours: A systematic review and meta-analysis of randomized studies. *Obesity Reviews*. 2016; 17: 201-210.
 22. Gorski Findling MT, Werth PM, Musicus AA et al. Comparing five front-of-pack nutrition labels' influence on consumers' perceptions and purchase intentions. *Preventive Medicine*. 2018; 106: 114-121.
 23. Morley B, Scully M, Martin J, et al. What types of nutrition menu labelling lead consumers to select less energy-dense fast food? An experimental study. *Appetite*. 2013; 67: 8-15.
 24. Roberto CA, Bragg MA, Schwartz MB, et al. Facts up front versus traffic light food labels: A randomized controlled trial. *American Journal of Preventive Medicine*. 2012; 43: 134-141.
 25. Hieke S, Wilczynski P. Colour Me In--An empirical study on consumer responses to the traffic light signposting system in nutrition labelling. *Public Health Nutrition*. 2012; 15: 773-782.
 26. Seward MW, Block JP, Chatterjee A. A Traffic-Light label intervention and dietary choices in college cafeterias. *American Journal of Public Health*. 2016; 106: 1808-1814.
 27. Feldman C, Harwell H, Brusca J. Using student opinion and design inputs to develop an informed university foodservice menu. *Appetite*. 2013; 69: 80-88.