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Characteristics and Perception of Healthy Food as Perceived by College Students

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Characteristics and Perception of Healthy Food as Perceived by College Students

Abstract

This study was designed to determine the characteristics of healthy food as reported by college students at a university in the southwestern United States. The results of this study validated the premise that healthy foods could be identified by classifying several features common to them, and that healthy food could then be defined using these characteristics: “low calorie food” ($\alpha=.869$), “low greasy food & healthy drink” ($\alpha=.764$), and “low cholesterol food “ ($\alpha=.734$). This study helped to classify the characteristics of healthy food and, therefore, this information could be used to develop healthy menus in university foodservice settings and related marketplaces.

Key Words: Healthy food, Healthy menu, College student

Approximately two-thirds of adults in the United States, over the age of 20, face the challenge of being overweight or obese (Hedley et al., 2004), and the obesity rate has increased steadily in the U.S. over the last 30 years (Ogden et al., 2006). The National Health and Nutrition Examination Survey II (NHANES) reported that between 1976 -1980 about 15% of adults over the age of 20 were obese. In the 1988–1994 NHANES III, obesity rates increased to over than 20%. By 2007 the NHANES reported that over one-third of American adults (34%) were obese, and the majority (65.7%) were now overweight or obese (Ogden, Carroll, McDowell, & Flegal, 2007). There was a continuous increase in the prevalence of obesity as reported in the 2003–2004 NHANES II study (30.6%) to the 2005–2006 study even though there was no significant increase (Ogden et al., 2007).

Previous research has shown the most important factors predicting food choices or selection among adults are: taste, cost, nutrition, convenience, pleasure, and weight control (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). Many previous studies have shown people often establish taste preferences and eating habits while they are relatively young (Birch, 1999; Drewnowski & Hann, 1999). However, the most important time of life for food selection or choice is when individuals are college students (Deshpande & Basil, 2009). Leaving the family home to attend college is a critical period for young adults, in which they are given the opportunity to make their own food decisions and this can have a negative impact on students' eating behaviors (Marquis, 2005). The increasing rates of obesity, which, unless there is disease, are a result of excessive caloric intake in relation to caloric output, are evident across all populations and this is raising concern. Additionally, inadequate consumption of nutrients essential to health presents a risk to the nation's level of wellness (Hendricks & Herbold, 1998).

Over the past 30 years, the trend of food consumption has changed in the United States and the foodservice industry has undergone a great deal of improvement in recent years (Sneed & Strohbahn, 2008). The restaurant food service industry is an important part of American culture. In 2007

approximately 57% of Americans used “delivery service” to their home or office and about 37% of consumers used “takeout service” according to the National Restaurant Association. The foodservice industry has been modernized by developing technology for automated procurement systems; improved hardware and software interfaces; superior connectivity in multi-unit restaurant facilities; and interactive employee-training tools (Liddle, 2005). Increased healthy food consciousness is one of major characteristics in recent times (Hwang & Lorenzen, 2008). The National Restaurant Association (NRA) identified “interest in health and nutrition” among its top 10 consumer trends for 2004. A study of 1,127 menu items lower in fat, 878 regular fat items, and 44% of an unknown classification, from eight restaurant companies found customers were significantly more satisfied with lower-fat menu items than with regular menu items regardless of food type, dining experience, frequency of eating out, or informants’ characteristics (Fitzpatrick, Chapman, & Barr, 1997). In a study by the National Restaurant Association consumers in full-service restaurants reported that they were eating more salads (33%), seafood entrees (30%), chicken entrees (25%), and drinking more bottled water (25%) than they did in the year 2000 (NHR, 2002). The managers of foodservice are examining new ways of exploiting market opportunities to satisfy their customers. For the ultimate success in the foodservice industry, managers must make available healthy menus.

The general awareness of the healthy menu that dominated the 1990s has led to greater menu choices in foodservice for both business and industry. A report of the Public Health Agency (2001) showed that the term ‘healthy eating’ meant cutting down on fried or fatty foods, and 51% of the informants also said “eating plenty of fruit, vegetables, and salad.” Kwan, Lee and Yoon (2009) defined a healthy menu item as “a menu item with an increased nutritional value or decreased health risk attributed to a change of food ingredients or cooking methods.” Generally speaking, healthy menus are now being provided with more varied choices including low-fat and lowered calorie menu options.

The data were collected using the intercept technique during the spring 2010 at a major university in the southwest. The researchers distributed the survey to college students in the library and restaurant at the university. Data were compiled and statistically analyzed by using the statistical analysis program SPSS (Statistical Package for Social Science) release 17.0 for Windows (SPSS Inc., Chicago, IL). Demographic statistics were analyzed to determine the informants' socio-demographic factors. To test the reliability and internal consistency of each factor, Cronbach's Alpha of each factor was determined and the factors with Alpha of .6 were retained for further analysis.

Results

Out of 200 questionnaires, 161 questionnaires (80.5%) were collected and used for the statistical analysis. Forty-seven percent of the informants were male students and around 53% were female. Eighty percent of the informants were White and 9.9%, 6.8%, 1.9% and 1.2% were Hispanic, African-American, Native American-Indian, and Other, in that order. The most frequently occurring classification group was Sophomore (31.7%), followed by Senior (30.4%), Junior (23.0%), freshman (14.3%), and graduate student (0.6%). For the marital status category, approximately 94% informants were single and 3% were married. More than 93% of the students were living on their own alone, and only 6.8% of the students were living with their family.

Table 1 showed that where college students get information about healthy food. As you can see the most popular source was the Internet (21.6%), followed by classes (17.5%), friends and/or family members (16.6%), books and/or magazines (16.4%), television (16.2%), research journals (3.1%), newspapers (3.1%), and radio (2.7%). According to previous studies exposure to food advertising, such as fast food, convenience food, and soft drinks can affect a viewer's food choices (Story et al., 2002), and television was the favorite advertising medium used by the food industry (Gallo, 1999). A study conducted by Freisling, Haas, and Elmadfa (2010) reported that television and the Internet—as a source

of nutrition information—are positively associated with daily fruit and beverage consumption. The U.S. food marketing system is the second-largest advertiser in the economy and a leading supporter of network television, magazine, radio, and newspaper advertisements (Story et al., 2002). This shows that mass media plays an important part as a source for healthy food information.

A paired t-test was conducted to compare factors of food choice between “normal foods” and “healthy foods” (Table 2). There were significant differences in the score for “reasonable price” between normal food (M = 3.89, SD = 0.975), and healthy food (M = 4.02, SD = 0.869), and for “nutrition value” between normal food (M = 4.01, SD = 0.802) and healthy food (M = 4.16, SD = 0.880). Those two factors were found to be significant at the 0.05 significance level. This means that these two factors show a significantly different mean value between healthy foods and normal foods. This result is supported by previous studies such as Barratt (1997) who reported that a healthy diet is more expensive than the average diet, and Magnusson, et al., (2003) who reported that organic food was more expensive and healthier than other food. The informants also thought that the price and nutritional value of healthy foods were significantly more important factors than for normal foods.

Color is everywhere and is an important source of information. And color is one of most important parts in the marketing of food (Singh, 2006). In a pilot test, we asked that “which color(s) represent healthy foods?” by using short answer questions. Based on the responses, we classified several items in order to ask about the color of healthy foods. As shown in Table 3 and Figure 1, eight colors were used to define healthy food. Green (34.3%) was the most popular color selected to represent healthy foods, followed by orange (14.6%), red (14.0%), yellow (12.7%), white (8.7%), purple (7.9%), and brown (5.7%). This result is very similar to the “Food Guide Pyramid” which is one way for people to understand how to eat healthfully. A rainbow of colored, horizontal stripes: orange, green, red, yellow, blue, and purple, represents the five food groups plus fats and oils. Research suggests that people try to eat five different colors of fruits and vegetables daily. According to the U.S. Department of Agriculture, it is important to eat a rainbow since disease-fighting antioxidants also give foods their color (USDA, 2005).

In addition, Nadeau, and Underwood (2003) reported that eating colorful fruits and vegetables can prevent many kinds of disease from occurring. The authors strongly advocate eating colorful foods can protect people's health from diseases. The following results support using the eight healthy colors we classified in this study to identify which colors represented healthy food to the participants.

"Drink water" was reported as the most important factor ($M = 4.02$, $SD = 1.00$) to college students (Table 4) followed by "eat vegetable" ($M = 3.98$, $SD = 0.95$), "drink fruit juice" ($M = 3.97$, $SD = 0.98$), "eat fruit" ($M = 3.90$, $SD = 0.94$), "reduce fatty food" ($M = 3.58$, $SD = 1.19$), "reduce fried food" ($M = 3.57$, $SD = 1.19$), "eat fiber" ($M = 3.45$, $SD = 1.06$), "reduce sugar" ($M = 3.41$, $SD = 1.15$), "eat white meat" ($M = 3.29$, $SD = 1.28$), "reduce salt" ($M = 3.02$, $SD = 1.19$), and "avoid red meat" ($M = 2.02$, $SD = 1.19$). According to previous studies, many researchers reported that salt intake has been linked to cardiovascular diseases and obesity and they suggest that people reduce their salt intake for health (Desmond, 2006; Dickinson & Havas, 2007; Frieden & Briss, 2010). Even though, many researchers emphasize reducing salt intake, the participants in this study responded that the "reduce salt" factor was not a more important factor than any other. This result may mean that this population of college students has misconceptions about healthy food.

Factor analysis was used to confirm whether the number of dimensions conceptualized could be verified empirically. In this study, the factor analyses for "healthy food factors" were classified into three categories: 1) Low Calorie Food, 2) Low Greasy food & Healthy Drink, and 3) Low Cholesterol Food. As shown in Table 5, each factor had an Eigen value above 1.0 and the total variance was 66.43%. The coefficient alpha is the basic statistic to determine the reliability of the measurement based on the internal consistency. One of the most commonly used statistics is Cronbach's alpha. As shown the Table, the total Cronbach's alpha value designated that the model was internally reliable ($\alpha = .874$). Three factors were above .70 criterions therefore all of the factors were retained for additional analysis based on Cronbach's alpha values: factor 1 ($\alpha = .869$), factor 2 ($\alpha = .764$), and factor 3 ($\alpha = .734$). The content validity was verified since all items of the measurement were adopted from previous studies (Nunnally, 1967).

The three factors identified were: “low calorie food” ($\alpha=.869$), “low greasy food & healthy drink” ($\alpha=.764$), and “low cholesterol food” ($\alpha=.734$). The low-calorie food dimension included five items that pertained to calories: reduce fatty food, reduce fried food, reduce sugar, eat vegetable, and eat fruit. There were four items in the low greasy food & healthy drink dimensions: eat starch, eat fiber, drink water, and drink fruit juice. In the low cholesterol food dimension, there were three items: reduce salt, eat white meat, and avoid red meat. Therefore, to classify the characteristics of healthy food, a factor analysis was conducted for “low calorie food,” “low greasy food & healthy drink,” and “low cholesterol food.”

Conclusions

The results of this study validated the premise that healthy foods could be identified by classifying several features common to them, and that they could then be defined using these characteristics. In addition, the results clearly demonstrated that perception of healthy foods showed significantly different features among demographic characteristics. Also, this study found few different factors for “healthy food choice” decisions as compared to other types of foods among this population of college students. Even though the correlation was not considered to be a strong one, there was a significantly positive correlation between knowledge of healthy foods and health concern. Finally, this study helped to classify the characteristics of healthy food and, therefore, this information could be used to develop healthy menus in university foodservice settings and related marketplaces.

Implication

These results are relevant for foodservice establishments working with consumers. Understanding the perception of healthy foods and determining healthy eating behaviors and health knowledge of college students can help in the development of strategies for foodservice industry management. Meaningful strategies for promoting healthy food consumption are important to encourage people about the benefits of healthy food choices. Foodservice managers need to fully understand the importance of healthy eating behaviors, characteristics of healthy foods, and the importance of healthy foods, which can help reduce the frequency of obesity and related health problems. University foodservice managers can create healthy

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food just by changing a cooking method or ingredients to make healthier foods. Providing these healthier foods will satisfy consumers, and they will come back to a dining facility or recommend it to their friends. The current findings also support the earlier research of Arredondo, Castaneda, Elder, Slymen, & Dozier, 2008 that healthy food is an important marketing strategy to foodservice companies. Foodservice managers need to know “what makes a food healthy?” and “what kinds of healthy food do customers want to eat?” Hence, the managers of university foodservices need to develop strategic plans for including healthy food on their menus in order to provide more sustainable, healthy food options to satisfy customer demands.

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Table 1 International CHRIE Conference-Refereed Track, Event 8 [2011]
Healthy Food Information Sources (N=161)

Information Source	Frequency	Percent
Television	84	16.2
Radio	14	2.7
Book or Magazines	85	16.4
Friends or Family members	86	16.6
Internet	112	21.6
Classes	91	17.5
Research Journals	16	3.1
Newspaper	16	3.1
Other	15	2.9
Total	519*	100

* Multiple choices allowed

Table 2
Paired Sample t-test for Important Factors in Food Choice (N=161)

	Normal Food		Healthy Food		t
	M	SD	M	SD	
Ingredients	3.88	1.07	3.96	0.89	1.36
Temperature	3.65	1.04	3.68	0.93	0.46
Price	3.89	0.96	4.02	0.87	2.07*
Taste	4.60	0.67	4.50	0.66	1.93
Nutrition Value	4.01	0.80	4.16	0.88	2.45*
Short serving time	3.34	0.88	3.41	0.96	1.30
Suggestions of my friends or family	3.17	0.99	3.25	0.97	1.43

* $P < 0.05$.

Table 3 Lee et al.: Characteristics and Perception of Healthy Food as Perceived by Co
Healthy Food Colors

Rank	Color	Frequency	Percent
1	Green	157	34.3%
2	Orange	67	14.6%
3	Red	64	14.0%
4	Yellow	58	12.7%
5	White	40	8.7%
6	Purple	36	7.9%
7	Brown	26	5.7%
8	Other	10	2.2%
Total		458*	100%

* Multiple choices allowed

Table 4
Important Feature of Healthy Foods among College Students (N=161)

Rank	Factors	Mean	SD
1	Drink water	4.02	1.00
2	Eat vegetable	3.98	0.95
3	Drink fruit juice	3.97	0.98
4	Eat fruit	3.90	0.94
5	Reduce fatty food	3.58	1.19
6	Reduce fried food	3.57	1.19
7	Eat fiber	3.45	1.06
8	Reduce sugar	3.41	1.15
9	Eat white meat	3.29	1.28
10	Eat starch	3.03	1.01
11	Reduce salt	3.02	1.19
11	Avoid red meat	2.02	1.19

Table 5 International CHRIE Conference-Refereed Track, Event 8 [2011]
Factor Analysis Results of Healthy Food Characteristics Factors (N=161)

Factors and Items	Factor Loading	Eigenvalue	Variance (%)	Cronbach's alpha
Factor 1: Low Calorie Food		3.299	27.492	0.869
Reduce sugar	.836			
Reduce fatty food	.745			
Eat vegetable	.744			
Reduce fried food	.740			
Eat fruit	.732			
Factor 2:Low Greasy Food & Healthy drink		2.378	19.819	0.764
Drink Water	.878			
Drink fruit juice	.873			
Eat Starch	.500			
Eat fiber	.480			
Factor 3: Low cholesterol food		2.251	18.761	0.734
Reduce salt	.768			
Eat white meat	.751			
Avoid red meat	.721			
Total			66.072	0.874

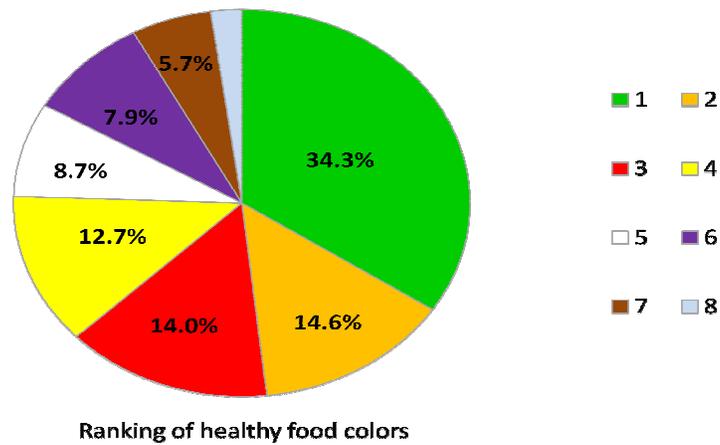


Figure 1. Diagram of healthy colors by college students