Canned Food Choices of College Students Using the NuVal® Nutrient-Profiling System

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Introduction

➢ There is limited research on how consumers are determining the nutritional value of a food product and/or use available nutrition information to select foods (Grunert & Wills, 2007; Williams, 2005).

➢ To avoid confusion, food labeling systems need to be simplified (Chiuve, Sampson, & Willett, 2011).

➢ The NuVal® Nutritional Profiling System provides a simplified nutrition scoring guide for consumers, generating scores from 1 to 100, with a higher number indicating a higher nutritional value in a product (Katz, Njike, Rhee, Reingold, & Ayoob, 2010).

➢ Understanding nutrition food labels is important to help consumers follow the government's general dietary guidelines, which are 1.5 to 2 cup equivalents of fruits and 2 to 3 cup equivalents of vegetables (Rothman et al., 2006; NCI, 2015).

➢ Canned food consumption may be a viable, nutritious option for cost-conscious individuals to meet required amounts of fruits and vegetables all year-round (Miller & Knudson, 2014).

Research Question

Can students accurately determine the healthiest canned food when asked to choose their preference from common canned fruits and vegetables?

Hypotheses

➢ H0 1: There is no significant difference in mean percent correct score by type of canned food (canned fruits vs. canned vegetables).

➢ H0 2: There is no significant difference in mean percent correct score by gender of the respondent (by type of canned food).

➢ H0 3: There is no significant difference in mean percent correct score by age of the respondent (by type of canned food).

➢ H0 4: There is no significant difference in mean percent correct score by academic major of the respondent (by type of canned food).

➢ H0 5: There is no significant difference in mean percent correct score by income of the respondent (by type of canned food).

Methods

Sample Population (n=190)

• Convenience sampling

• Undergraduate students from general education courses offered at California State University Long Beach (CSULB) in fall 2017

  – Introductory Nutrition (n= 5 sections)

  – Consumer Affairs (n= 4 sections)

Methods

Procedures

• Permission from instructors granted

• IRB approval

Measures

• 5 popular canned food products selected at local grocery stores in Long Beach, California and Pittsburgh, Pennsylvania (n=2 canned fruits; n=3 canned vegetables)

• NuVal® score was determined for each of these products by scanning each canned item using the NuScan app.

Data Collection

• 9-item questionnaire using Qualtrics (2017 Version, Qualtrics, Provo, UT)

• Students were asked to rank, from one to three (3 being the highest score), which canned food item they perceived as the most nutritious.

Data Analysis

• H1: Paired samples t-test

• H2 - H5: Two-sample independent t-test

• Statistical Package for Social Sciences (SPSS; IBM Corp, Amonk, NY, 2016) was used to input and analyze the data.

FIGURE 1. Sample Question from Survey with NuVal® Scores

Sliced Peaches (3= most nutritious; 1= least nutritious)

Del Monte®   85 | Kroger®   24 | Simple Truth™   74
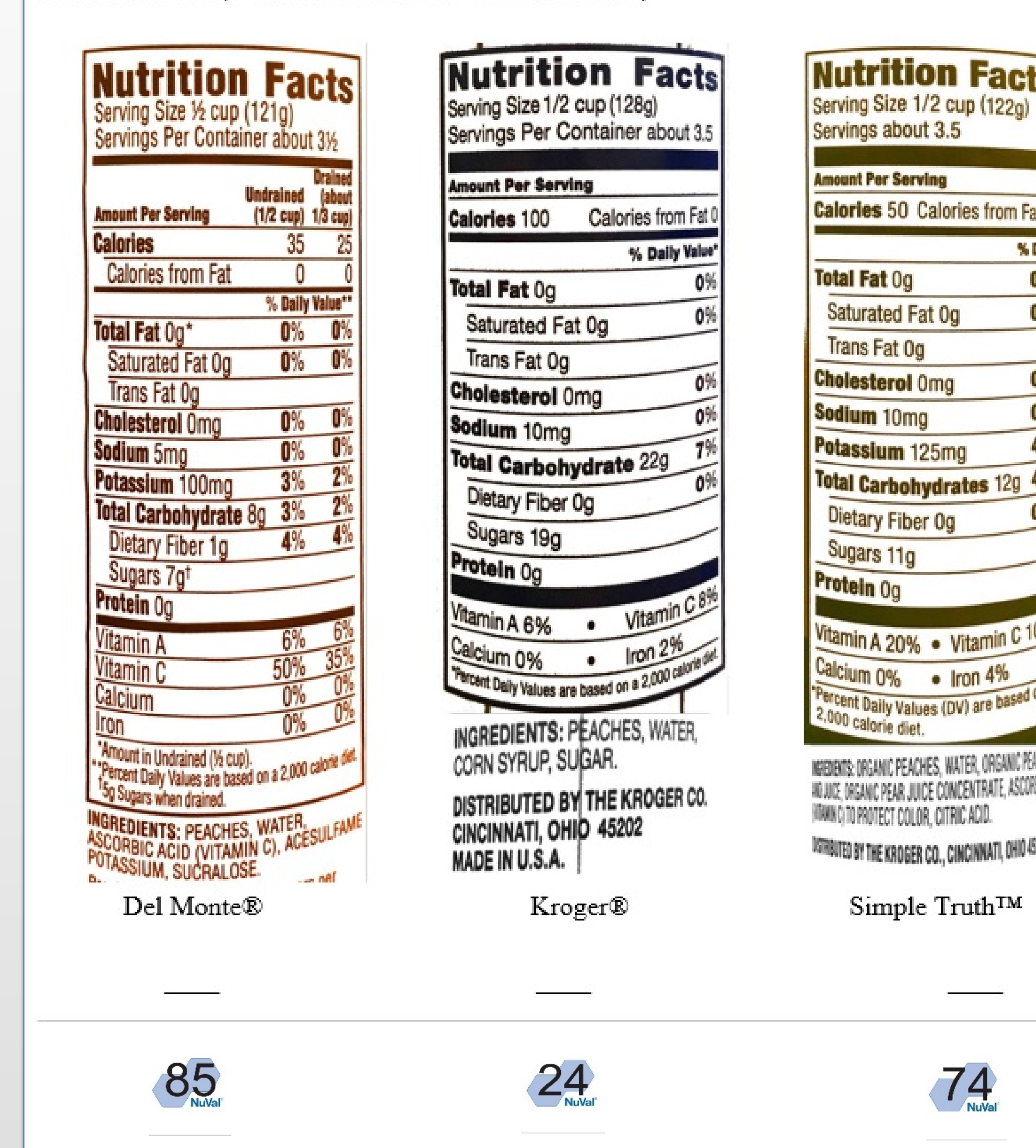
Results

➢ A total of 190 students completed the online survey.

➢ A majority of the respondents were:

  ➢ Female (n =129, 68.6%)

  ➢ Ages 18 to 45 years old (n =143, 75.3%)

  ➢ Non-health related majors (n=120, 67%)

  ➢ Annual income less than $10,000 per year (n =111, 68.9%)

➢ More accurate responses in canned fruits than in canned vegetables

TABLE 1. Comparison of Mean Percent Correct Scores Among Canned Food Types and Canned Food Items

Canned Food Type	Canned Food Item	n	%	Mean	Std. Error
Fruit (n = 2)		103	54.2	0.68	0.03
	Apple Sauce	127	67.2	0.67	0.03
	Peach (Slices)	132	69.5	0.69	0.03
Vegetable (n = 3)		39	20.5	0.52	0.03
	Sweet Peas	102	53.7	0.54	0.03
	Tomato (Diced)	100	52.6	0.53	0.03
	Whole Kernel Sweet Corn	94	49.5	0.49	0.03

➢ No statistical significant differences among gender and age groups

➢ Mean percent correct score of canned fruits was significantly higher among participants with annual income greater than $10,001 than participants with income less than $10,000 per year.

➢ Mean percent correct score of canned vegetables was significantly higher among non-health-related majors than health-related majors.

TABLE 2. Results of t Tests Comparing Mean Percent Correct Score for Canned Fruits by Gender, Age, Major, and Income of Respondent

Variable		n	Mean	Std. Error	t	df	p
Gender							
	Male	59	0.63	0.05	-1.31	186	0.193
	Female	129	0.71	0.03			
Age							
	Under 18 years old	47	0.66	0.06	-0.51	188	0.611
	Between 18 and 45 years old	143	0.69	0.03			
Major							
	Health related	59	0.72	0.05	0.75	177	0.453
	Non-health related	120	0.68	0.03			
Income							
	Income under $10,000	111	0.64	0.04	-1.98	109	0.050*
	Income greater than $10,001	50	0.76	0.05			

*Statistically significant at $p < 0.05$.

TABLE 3. Results of t Tests Comparing Mean Percent Correct Score for Canned Vegetables by Gender, Age, Major, and Income of Respondent

Variable		n	Mean	Std. Error	t	df	p
Gender							
	Male	59	0.47	0.04	-1.34	186	0.182
	Female	129	0.54	0.03			
Age							
	Under 18 years old	47	0.48	0.05	-1.03	188	0.304
	Between 18 and 45 years old	143	0.53	0.03			
Major							
	Health related	59	0.43	0.04	-2.48	177	0.014*
	Non-health related	120	0.56	0.03			
Income							
	Income under $10,000	111	0.51	0.03	-0.91	159	0.365
	Income greater than $10,001	50	0.56	0.05			

*Statistically significant at $p < 0.05$.

Conclusion

➢ It is uncertain that consumers are able to use the available nutrition information on product labels and interpret them correctly to select healthier canned food options.

➢ Being unable to properly interpret nutrition values of these canned products can result to poor food choices.

➢ This research study was similar to other studies that have questioned consumers' ability to comprehend and interpret food labels (Cowburn & Stockley, 2005; Gorton, Ni Mhurchu, Chen, & Dixon, 2009; Kim & Kim, 2009; Roberto et al., 2012).

➢ Further research is warranted to show trends in accuracy of choice of nutritious canned food items among gender, age, academic major, and income groups of college students.

➢ More research studies are needed to understand the associations of nutrition knowledge, judgment accuracy, and food choices among consumers.

Implications

➢ It is difficult to pinpoint specific nutrients and compare the nutritional value of food products.

➢ Everyone can benefit the NuVal® Nutritional Scoring System

  ➢ Quick

  ➢ Simple (from 0-100)

  ➢ Easy

  ➢ Convenient

➢ NuVal® helps consumers make decisions with confidence in navigating and selecting healthier food options.

References

Chiuve, S., Sampson, L., & Willett, W. (2011). The association between a nutritional quality index and risk of chronic disease. *American Journal of Preventive Medicine, 40*(5), 505-513

Cowburn, G., & Stockley, L. (2005). Consumer Understanding and Use of Nutrition Labelling: A systematic review. *Public Health Nutrition, 8*(01), 21-28.

Gorton, D., Ni Mhurchu, C., Chen, M., & Dixon, R. (2009). Nutrition labels: A survey of use, understanding and preferences among ethnically diverse shoppers in New Zealand. *Public Health Nutrition, 12*(9), 1359-1365.

Grunert, K., & Wills, J. (2007). A review of European research on consumer response to nutrition information on food labels. *Journal of Public Health, 15*(5), 385-399.

Katz, D., Njike, V., Rhee, L., Reingold, A., & Ayoob, K. (2010). Performance characteristics of NuVal and the Overall Nutritional Quality Index (ONQI). *The American Journal of Clinical Nutrition, 91*(4), 1102S-1108S.

Kim, W., & Kim, J. (2009). A study on the consumer's perception of front-of-pack nutrition labeling. *Nutrition Research and Practice, 3*(4), 300-306.

Miller, S., & Knudson, W. (2014). Nutrition and cost comparisons of select canned, frozen, and fresh fruits and vegetables. *American Journal of Lifestyle Medicine, 8*(6), 430-437.

National Cancer Institute. (2015, May 20). *Usual dietary intakes: Food intakes, U.S. population, 2007–10.* Retrieved March 8, 2017, from the Epidemiology and Genomics Research Program website: http://epi.grants.cancer.gov/diet/usualintakes/ pop/2007-10/

Roberto, C. A., Bragg, M. A., Schwartz, M. B., Seamans, M. J., Musicus, A., Novak, N., & Brownell, K. D. (2012). Facts up front versus traffic light food labels: A randomized controlled trial. *American Journal of Preventive Medicine, 43*(2), 134-141.

Rothman, R., Housam, R., Weiss, H., Davis, D., Gregory, R., et al. (2006). Patient understanding of food labels: The role of literacy and numeracy. *American Journal of Preventive Medicine, 31*(5), 391-398.

Williams, P. (2005). Consumer understanding and use of health claims for foods. *Nutrition Reviews, 63*(7), 256-264.

Acknowledgments

For more information

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