Summary of Findings: Influence of Nutrition Information Provision

People want nutrition information from restaurants; 78% of Americans support menu labeling policies (Caravan Opinion Research, 2008). In addition, they need it. Consumers, and even nutrition professionals, are **unable to accurately estimate the calorie content of popular restaurant foods** (Technomic, 2008; CCPHA, 2007; End Hunger Connecticut, 2007; Wansink & Chandon, 2007; Burton et al., 2006; Kozup et al., 2003; Backstrand et al., 1997).

Studies have found that the provision of **nutrition information for packaged foods** (Fitzgerald et al., 2008; Variyam 2008; Variyam & Cawley, 2006; Lin & Lee, 2003; Kral et al., 2002; Kim et al., 2001; Kristal et al., 2001; Finke, 2000; Kim et al., 2000; Mathios, 2000; Neuhouser et al., 1999; Kreuter et al., 1997; Ford et al., 1996; Russo et al., 1986) and **away-from-home foods** (Bassett, 2008; Technomic, 2008; Burton et al., 2006; Conklin et al., 2005, Yamamoto et al., 2005; Burton & Creyer, 2004; Cranage et al., 2004; Kozup et al., 2003; Balfour et al., 1996; Cincirpini 1984; Milich et al., 1976) can have a **positive influence on food-purchase decisions**.

Packaged Food Labeling Studies

- ❖ Crutchfield S et al. "The Economic Benefits of Nutrition Labeling: A Case Study for Fresh Meat and Poultry Products." Journal of Consumer Policy 2001;24:185-207. The U.S. Department of Agriculture estimated the economic benefits of extending nutrition labeling on packaged foods to fresh meat and poultry to be \$62 million to \$125 million per year due to reduced intakes of saturated fat and cholesterol and the prevention of stroke, heart disease and cancer.
- ❖ Finke MS. "Did the Nutrition Labeling and Education Act Affect Food Choices in the United States?" The American Consumer and the Changing Structure of the Food System Conference. Arlington, VA: Economic Research Service, USDA, 2000. The author assessed fat intake and label use from the 1989 (prior to the implementation to the Nutrition Labeling and Education Act [NLEA]) and 1995 (post-NLEA implementation) Continuing Survey of Food Intakes by Individuals (CSFII) and Diet and Health Knowledge Survey. Multivariate analysis revealed that people who often used food labels in 1995 (post-NLEA) were more likely to eat a low-fat diet than people who often used 1989 food labels (pre-NLEA). The likelihood of eating a low-fat diet in the 1995 sample was 37% higher for people who often used food labels than for people who rarely used labels.
- ❖ Fitzgerald N et al. "Nutrition Knowledge, Food Label Use, and Food Intake Patterns among Latinas with and without Type 2 Diabetes." *Journal of the American Dietetic Association* 2008;108:960-967. A study of 201 Latinas with

- and without type 2 diabetes found that after adjusting for likely confounders, using food labels to choose high-fiber foods was associated with eating more fruits and vegetables, and using labels to choose low-sodium foods was associated with lower salty snack intake.
- ❖ Food and Drug Administration, U.S. Department of Health and Human Services. Federal Register 1999;64:62772-62774. The U.S. Food and Drug Administration (FDA) estimated that requiring trans fat to be listed on packaged-food labels would save 2,100 to 5,600 lives a year and \$3 billion to \$8 billion a year.
- ❖ Ford GT, Hastak M, Mitra A, Ringold DJ. "Can Consumers Interpret Nutrition Information in the Presence of a Health Claim? A Laboratory Investigation." Journal of Public Policy and Marketing 1996;15:16-27. Nutrition information on frozen dinners had a strong effect on consumer beliefs regarding the products.
- ❖ Kim SY et al. "Food Label Use, Self-Selectivity, and Diet Quality." Journal of Consumer Affairs 2001;35:346-363. The authors used the USDA's 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII) and the Diet and Health Knowledge Survey. The results show that food label use has a positive effect on diet quality as measured by the Healthy Eating Index.
- Kim SY et al. "The Effect of Food Label Use on Nutrient Intakes: An Endogenous Switching Regression Analysis." Journal of Agricultural and Resource Economics 2000;25(1):215-231. Using the USDA's 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII) and the Diet and Health Knowledge Survey, the authors found that food label use decreases average daily intake of fat, saturated fat, sodium, and cholesterol and increases intake of fiber.
- ❖ Kral TVE, Roe LS, Rolls BJ. "Does Nutrition Information about the Energy Density of Meals Affect Food Intake in Normal-Weight Women?" Appetite 2002;39:137-145. The relationship between dietary restraint (that is, whether or not the consumer was consciously trying to regulate food consumption for the purpose body weight regulation) and food intake differed depending on whether or not nutrition information was presented. While the intake of food by restrained eaters was not influenced by information provision, unrestrained eaters consumed less food when nutrition information was presented.
- Kreuter MW et al. "Do Nutrition Label Readers Eat Healthier Diets? Behavioral Correlates of Adults' Use of Food Labels." American Journal of Preventive Medicine 1997;13:277-283. A survey of 885 patients from four family medicine clinics found that patients eating less fat and more fruits, vegetables, and fiber were more likely to report that food labels influence their food purchase decisions.

- ❖ Kristal AR et al. "Predictors of Self-initiated, Healthful Dietary Change." Journal of the American Dietetic Association 2001;101:762-766. A cohort study of 838 men and women found that food label use was one of the strongest predictors of decreased fat intake, but was not linked with changes in fruit and vegetable consumption.
- ❖ Lin CTJ and Lee JY. "Dietary Fat Intake and Search for Fat Information on Food Labels: New Evidence." Consumer Interests Annual 2003;49:1-3. The Food and Drug Administration and Florida Department of Citrus used simultaneous-equation modeling of data from the USDA 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII) and Diet and Health Knowledge Survey. They found that the less a person used food labels the higher the percentage calories from fat in a person's diet (and vice versa, the more fat in the diet, the less likely a person was to have used food labels).
- ❖ Mathios AD. "The Impact of Mandatory Disclosure Laws on Product Choices: An Analysis of the Salad Dressing Market." Journal of Law and Economics 2000;43:651-675. The impact of the Nutrition Labeling and Education Act (NLEA) was assessed using nutrition label information and supermarket scanning data from a supermarket chain in New York. The author found a significant decrease in the sales of higher fat salad dressings after they were required to be labeled.
- ❖ Moorman C. "Market-level Effects of Information: Competitive Responses and Consumer Dynamics." Journal of Marketing Research 1998;35:82-98. The author assessed the effects of packaged food labeling between 1987 to 1993 and 1993 to 1996 on 124 brands in 21 product categories. She found an increase in the addition of positive nutrients to products after labeling went into effect, but did not find more deletions of negative nutrients from products. However, Moorman did find an increase in brand extensions involving the deletion of negative nutrients from products between 1993 and 1996.
- ❖ Neuhouser ML et al. "Use of Food Nutrition Labels Is Associated with Lower Fat Intake." Journal of the American Dietetic Association 1999;99:45-50,53. A survey of 1,450 adults found that food label use was significantly associated with lower fat intake.
- ❖ Russo JE et al. "Nutrition Information in the Supermarket." *Journal of Consumer Research* 1986;13:48-70. Posting prominent lists of added sugars information for breakfast cereals in a supermarket resulted in 1) a decrease in the average sugar per ounce of cereal purchased and 2) increased market share for low-sugar brands and a decrease in the share of high-sugar brands compared to a store without posted nutrition information.

- ❖ Variyam JN. "Do Nutrition Labels Improve Dietary Outcomes?" *Health Economics* 2008;17:695-708. Using difference-in-difference models the author found that food label use is associated with higher intakes of fiber and iron as compared to people who do not use labels.
- ❖ Variyam JN and Cawley J. *Nutrition Labels and Obesity*. NBER Working Paper No. W11956, January 2006. Using a difference-in-differences method and National Health Interview Survey data, the authors estimated the effects of NLEA. They found that Nutrition Facts labeling was associated with a decrease in body weight and the likelihood of obesity for the overall population, with the main effect on non-Hispanic white women. The economic benefit of this effect on body weight was estimated to be \$63 to \$166 billion over 20 years.

Identifying Healthier Options at Restaurants Is Difficult

- ❖ Backstrand J, Wootan MG, Young LR, Hurley J. Fat Chance. Washington, DC: Center for Science in the Public Interest, 1997. A study conducted by the Center for Science in the Public Interest and New York University found that even well-trained nutrition professionals could not accurately estimate the calorie content of typical restaurant meals. Although the dietitians were able to accurately estimate the caloric content of a cup of whole milk (the control in the study), they consistently underestimated the calories in restaurant foods and meals. Their estimations were off by large amounts − by 200 to 600 calories. For example, when shown a typical dinner-house hamburger and onion rings, the dietitians on average estimated that it had 865 calories, when it actually contained 1,550 calories.
- ❖ Burton S et al. "Attacking the Obesity Epidemic: The Potential Health Benefits of Providing Nutrition Information in Restaurants." *American Journal of Public Health* 2006;96:1669-1675. Burton and his colleagues explored how much the average consumer knows about the calories, fat and other macronutrient levels found in foods served at restaurants. Their results show that consumers substantially underestimated the levels of calories, fat, saturated fat, and cholesterol found in many less healthful menu items.
- California Center for Public Health Advocacy (CCPHA). Statewide poll on March 20-31, 2007 conducted by Field Research Corporation of 523 registered California voters. Accessed at www.publichealthadvocacy.org/menulabelingpoll.html. A representative, state-wide telephone poll in California found that few Californians are able to identify from among popular fast-food and other chain restaurant menu items those with the fewest/most calories, salt, or fat. Not a single respondent answered all four questions correctly. Less than 1 percent answered three of four questions correctly, only 5 percent answered two of the four questions

correctly, and nearly 68 percent were unable to answer even one question correctly. Scores were equally poor regardless of education or income levels.

- Equivalent results were found from a similar state-wide poll in Connecticut (End Hunger Connecticut. State-wide poll conducted between April 17 and April 23, 2007 by the Center for Survey Research and Analysis at the University of Connecticut of 501 Connecticut residents. Accessed at www.endhungerct.org/PDF/pollresults.pdf).
- ❖ Kozup KC, Creyer EH, Burton S. "Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items." *Journal of Marketing* 2003;67:19-34. A series of laboratory studies demonstrated that many consumers have very little knowledge of the high levels of calories, fat, and saturated fat found in many popular, less healthful restaurant items. For example, for some items such chicken fajitas and chef salad, actual calorie levels were twice what consumers expected.
- ❖ Technomic, Inc., September 2008. An on-line survey was conducted August 27-29, 2008 with 299 adults who live in the five New York City (NYC) boroughs. Of the people who have seen menu labeling at chain restaurants, 84% have been surprised by the calorie counts, with 97% finding the calories higher than expected.
- Wansink B and Chandon P. "Meal Size, Not Body Size, Explains Errors in Estimating the Calorie Content of Meals." Annals of Internal Medicine 2006;145:326-332. In two studies of 1) 105 lunchtime diners and 2) 40 undergraduate students, people underestimated the calorie content of fast-food meals by an average of 23% in study 1 and by 9% in study 2. Participants greatly underestimated the calories in larger fast-food meals, but more accurately estimated the calories in smaller meals.

Restaurant Labeling Studies

- ❖ Balfour D, Moody R, Wise A, Brown K. "Food Choice in Response to Computer-Generated Nutrition Information Provided about Meal Selections in Workplace Restaurants." Journal of Human Nutrition and Dietetics 1996;9:231-237. Employees in two worksite cafeterias were provided the opportunity to view nutrition information on computers in the cafeteria. Half (45%) opted to view the nutrition information. Of those, approximately, 15% changed what they ordered; their second (informed) choice was lower in calories and saturated fat.
- ❖ Bassett MT, Dumanovsky T, Huang C, Silver LD, Young C, Nonas C, Matte TD, Chideya S, Frieden TR. "Purchasing Behavior and Calorie Information at Fast-Food Chains in New York City, 2007. *American Journal of Public Health*

2008;98. A survey of 7,318 customers from 275 fast-food restaurants found that the average caloric content of fast-food restaurant lunches was 827 calories; 34% of purchased lunches contained over 1,000 calories. Subway customers who saw nutrition information in the restaurant purchased meals with an average of 52 fewer calories than people who did not see the information. A third of the Subway customers (37%) reported that the nutrition information affected their purchases; those customers purchased meals with 99 fewer calories than those who saw the information and reported it had no effect.

- ❖ Burton S, Creyer EH, Kees J, Huggins K. "Attacking the Obesity Epidemic: The Potential Health Benefits of Providing Nutrition Information in Restaurants." American Journal of Public Health 2006;96:1669-1675. Burton et al. found that when objective, quantitative nutrition information was provided, consumers had more unfavorable attitudes towards the less healthful menu options. Consumers' purchase intentions for the less healthful items were significantly diminished by the provision of nutrition information.
- ❖ Burton S and Creyer EH. "What Consumers Don't Know Can Hurt Them: Consumer Evaluations and Disease Risk Perceptions of Restaurant Menu Items." Journal of Consumer Affairs 2004;38:121-145. Burton and Creyer found that when favorable nutrition information was presented on restaurant menus, consumers had more favorable attitudes towards the items and higher purchase intentions. When unfavorable nutrition information was presented, there was a negative influence on product attitudes and purchase intentions. The authors note that the results imply that if restaurants were required to disclose nutrition information, consumers would be more likely to choose more healthful menu items. In addition, requiring restaurants to provide nutrition information may encourage restaurants to improve the healthfulness of their menu options.
- Caravan Opinion Research Corp., February 28 March 2, 2008, accessed at http://www.cspinet.org/new/pdf/census_menu_board_question.pdf). A nationally representative poll of 1,003 adults found that 78% of Americans believe fast-food and other chain restaurants should list nutritional information, such as calories, fat, or salt, on menus and menu boards.
- Center for Weight and Health, University of California, Berkeley and California Center for Public Health Advocacy. Potential Impact of Menu Labeling of Fast Foods in California. August 2009. Accessed at http://www.publichealthadvocacy.org/menulabeling.html. The U.C. Center for Weight and Health calculated that, on an annual basis, menu labeling could reduce the average adult fast-food patron's yearly intake by 9,300 calories, preventing the equivalent of 2.7 pounds of weight gain per person per year. If 80% of patrons see the nutrition information, menu labeling could result in prevention of 40 million pounds of weight gain annually for the entire state of

California; or an average of a one pound weight loss per person per year, rather than the current average weight gain of one pound per person per year.

- Cinciripini PM. "Changing Food Selections in a Public Cafeteria: An Applied Behavior Analysis." Behavior Modification 1984;8:520-539. Calorie information was provided on two large signs at each entrance of a university cafeteria. 5542 observations of undergraduates during lunch time found that providing calorie information was associated with reductions in consumption of red meat, carbohydrates, and regular dairy products. It also resulted in increased intakes of salads, vegetables, fruits, soup, and low-fat dairy products and a decrease in desserts and sauces for obese females.
- Conklin MT, Lambert CU, Cranage DA. "Nutrition Information at Point of Selection Could Benefit College Students." Topics in Clinical Nutrition 2005;20:90-96. Conklin, Lambert, and Cranage examined the use of nutrition and ingredient information by college freshman at the point of sale in campus dining facilities. Results showed that females were more likely than males to use the nutrition information labels to make food choices. Whereas females used to nutrition information to identify and select lower fat, lower calorie foods, males used the information to select foods with higher levels of protein. These results confirm the findings of a previous study that found that the provision of nutrition information can have a positive influence on the food purchase behaviors of college students.
- Cranage DA et al. "Effect of Nutrition Information on Perceptions of Food Quality, Consumption Behavior, and Purchase Intentions" Journal of Foodservice Business Research 2004;7(1):43-61. When nutrition information was displayed for entrée items in a restaurant setting, lower fat, lower calorie entrées were chosen more often and higher fat, higher calorie entrées were chosen less often.
- ❖ Kozup KC, Creyer EH, Burton S. "Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items." *Journal of Marketing* 2003;67:19-34. A series of laboratory studies conducted by Kozup and his colleagues demonstrated that many consumers have very little knowledge of the high levels of calories, fat, and saturated fat found in many popular, less healthful restaurant items. For example, for some items such chicken fajitas and chef salad, actual calorie levels were twice what consumers expected. When levels of calories, fat, and saturated fat substantially exceeded consumers' expectations, the provision of nutrition information had a significant negative effect on product attitude, purchase intention, and choice. The authors suggest that the provision of nutrition information on restaurant menus could potentially have a positive impact on public health by reducing the consumption of less healthful menu items.

- Milich R, Anderson J, Mills M. "Effects of Visual Presentation of Caloric Values on Food Buying by Normal and Obese Persons." Perceptual and Motor Skills 1976;42:155-162. In a study in a cafeteria setting, signs indicating the calorie content of available foods significantly decreased the number of calories that people ordered.
- ❖ New York City Department of Health and Mental Hygiene (NYCDHMH). Notice of Adoption of Resolution to Repeal and Reenact §81.50 of the New York City Health Code. New York City: NYCDHMH, January 2008. Using conservative estimates, the New York City Department of Health and Mental Hygiene estimated that, over the next five years, its menu labeling policy for fast-food and other chain restaurants would lead to at least 150,000 fewer New Yorkers being obese, resulting in at least 30,000 fewer cases of diabetes.
- Simon P, Jarosz CJ, Kuo T, Fielding JE. Menu Labeling as a Potential Strategy for Combating the Obesity Epidemic: A Health Impact Assessment. Los Angeles, CA: County of Los Angeles Public Health, Division of Chronic Disease and Injury Prevention, May 2008. Using conservative estimates, Los Angeles County Public Health estimated that menu labeling could prevent 39% of the 6.75 million pounds gained annually in Los Angeles County for people 5 years and older. The impact would be greater if larger proportions of people ordered fewer calories per restaurant meal.
- ❖ Technomic, Inc. poll, September 2008. An on-line survey was conducted August 27-29, 2008 with 299 adults who live in the five New York City (NYC) boroughs to assess the NYC menu labeling law. 84% responded that the calorie information on menus at chain restaurants is helpful when they are ordering. 75% of New Yorkers report that the nutrition information on menus has made an impact on their ordering; they are ordering lower calorie options, are no longer ordering certain menu items, or are ordering smaller portion sizes.
- ❖ Yamamoto JA et al. "Adolescent Fast Food and Restaurant Ordering Behavior with and without Calorie and Fat Content Menu Information."

 Journal of Adolescent Health 2005;37:397-402. 106 adolescents ordered dinner from three different restaurant menus without and then with nutrition information. The provision of nutrition information on the menu resulted in the selection of meals with lower calorie and fat content on average from two out of the three restaurant menus. About a third of the teens changed at least one of their meal orders when provided with menu labeling.

Updated 10/08