

Application of Nutritional Epidemiology to Support Food Safety and Nutrition Research

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Nutritional epidemiology is the study of how the foods we eat are involved in the etiology of disease. This includes the evaluation of how dietary patterns, components, nutrients, and contaminants are associated causally and non-causally with health outcomes or markers of disease. At Exponent, nutritional epidemiologists combine nutrition expertise, knowledge of national food and health databases, applied statistics, and risk-assessment to quantify the effects of the above factors on health outcomes including nutritional adequacy, diet quality, and incidence and biomarkers of disease. Methods to evaluate these relationships can range from conducting analyses, including meta-analyses, of observational data to designing and performing systematic, evidence-based reviews of the scientific literature. Companies in the food and beverage industry, associated trade and commodity groups, and food lawyers can apply nutritional epidemiology to support regulatory submissions to government agencies including the US Food and Drug Administration (FDA), provide safety evaluations of food ingredients, respond to litigation, and develop impactful public health messaging about their products.

The study of nutrition and disease has traditionally focused on individual foods or nutrients. Within the food and beverage industry, this type of focus remains relevant and necessary. Examples include proactive safety evaluations of food products or ingredients as well as conducting studies to contribute to the scientific evidence base of the effect individual dietary components have on health. In addition, reactive responses to litigation and the need to defend a specified food product against adverse claims can require this application of nutritional epidemiology. The food and beverage industry have used nutritional epidemiology to defend allegations of false advertising and the potential presence of contaminants that have been listed by the Office of Environmental Health Hazard Assessment (OEHHA) under California Proposition 65.¹ Teams of experts within the field of public health can examine nutritional epidemiology data to determine whether or not a contaminant found in a food is associated with adverse health outcomes and further, if those adverse effects outweigh the benefits of the role that food plays in the total diet. While the

significance of this work is noted, a shift in how health agencies are viewing and evaluating food presents new opportunities for organizations to proactively use nutritional epidemiology to determine how a specific food fits into a consumer's dietary patterns and the overall impact on health.

Every five years, the Department of Health and Human Services (HHS) and the United States Department of Agriculture (USDA) publish the Dietary Guidelines for Americans (DGA), the nation's go-to source for nutrition advice.² Beginning with the 2015-2020 DGA, there was a shift from evaluating foods and nutrients in isolation to examining them as part of a consumer's dietary pattern. The 2020-2025 DGA will continue this focus on dietary patterns to understand what is a "healthy" pattern and what are the potential benefits of following this pattern to the U.S. population. This presents an opportunity for the food and beverage industry, and related trade and commodity associations, to evaluate how their products fit within healthy dietary patterns and how their products

¹ <https://oehha.ca.gov/proposition-65>

² <https://health.gov/dietaryguidelines/>

³ <https://www.forbes.com/sites/megykarydes/2018/06/11/improving-our-diets-could-save-billions-in-health-related-costs/#3b703b044ac7>

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contribute within that pattern to helping Americans achieve nutrient adequacies, improve overall diet quality, and reduce chronic disease incidence. Exponent's team was recently highlighted in Forbes³ for their work on a comprehensive analysis of the potential billions of dollars in U.S. healthcare cost savings that could be realized from reductions in chronic disease incidence if the U.S. population were to make realistic improvements in their diet quality. The results of these analyses, funded by the National Dairy Council, were published in the Journal of the Academy of Nutrition and Dietetics⁴.

Exponent's team of public health scientists recently partnered with the American Beverage Association (ABA) to evaluate how the diet quality of consumers of low- and no-calorie sweetened beverage as well as zero-calorie unsweetened beverages compared to consumers of sugar-sweetened beverages. To answer this question, our team analyzed cross-sectional data from the National Health and Nutrition Examination Surveys (NHANES) including food consumption and composition databases that reflect the current U.S. food supply. We also conducted intricate analyses that required expert knowledge of the nutrition, diet, and health variables that are the same as those frequently relied

upon by the FDA, USDA, and Environmental Protection Agency (EPA) to monitor and enforce the safety of our food supply as well as set policy. Our team's findings were published in the peer-reviewed journal Nutrients and are publicly available. To view this publication, visit nutrients-422658.⁵ Both of these peer-reviewed publications provide concrete examples of Exponent's expertise and capabilities in the application of nutritional epidemiology and are now part of the scientific literature to provide highly relevant and timely data points that will add to the evidence base available for the updates to the 2020–2025 DGA.

Exponent's team of epidemiologists, statisticians, registered dietitians, toxicologists, and risk assessors are recognized by many in the food and beverage industry as well as U.S. and international authoritative bodies on food safety and nutrition as experts in their field. This unique multi-disciplinary team has a proven history of conducting nutritional epidemiological analyses and systematic reviews to help clients support regulatory submissions to government agencies, provide safety evaluations of ingredients within products, respond to litigation, and develop impactful public health messaging about their products.

⁴ [https://jandonline.org/article/S2212-2672\(18\)30461-1/fulltext](https://jandonline.org/article/S2212-2672(18)30461-1/fulltext)

⁵ <https://www.mdpi.com/2072-6643/11/2/314>



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