

## Research Quality in Focus: A Retrospective Look at Food & Nutrition Research

Nutrition research informs consumer eating habits, public policy, healthcare practice decisions and research agenda development. Yet, virtually every individual scientific study has limitations in design and methodology. The authors of a new analysis, “Opportunities for Improvement in Nutrition-Related Research: Implications of Overall Quality and Risk of Bias Domain Ratings,” examined these limitations to identify ways to improve scientific methods and in turn, research quality, in the future.

### Methodology:

Researchers use “Risk of Bias (ROB) domains” to evaluate the relative strengths of individual studies when conducting systematic reviews. A new study used this construct, in conjunction with other variables, to quantify research quality and its evolution over time.

This is one of the first studies to use ROB domains, as defined by Cochrane, in this way. Researchers typically use ROB domains to evaluate the relative strengths of individual studies when conducting systematic reviews.

This retrospective cross-sectional study investigated ROB domains identified in studies used in systematic reviews extracted from three databases: the Academy of Nutrition and Dietetics Evidence Analysis Library (EAL), USDA Nutrition Evidence Library (NEL) and the Agency for Healthcare Research and Quality (AHRQ) Evidence-Based Practice Center Reports.

The authors conducted a statistical review of 5,675 studies on a range of topics -- clinical nutrition, food safety, dietary patterns and dietary supplements. The studies utilized 15 different research designs with a balance of intervention (49%) and observation (51%) types. They were published between 1930 and 2015.

Study variables included: data source (EAL, NEL or AHRQ), ROB domains, overall quality rating (negative, neutral or positive), type of research (intervention or observational) and specific research design, publication year and funder.

Government-only funding (23.9% of the studies in the sample) served as the comparator for the analysis. The other categories include combined funders (25.6%), university only (16.9%), not reported or no funding (14.9%), industry only (8.1%), nonprofit only (5.9%), and other only (4.7%).

### Risk of Bias, Defined

Dimensions used by scientists to evaluate the relative strength of the evidence from study to study:

- **Selection bias**, or how participants are chosen and assigned to groups
- **Performance bias**, or how study interventions are defined, measured and managed
- **Detection bias**, or how well researchers measure outcomes and account for other factors that might influence results
- **Attrition bias**, or missing data, such as when participants drop out of a study
- **Reporting bias**, or ensuring study conclusions represent the data

Source: [Cochrane Methods](#)



### **Findings:**

The analysis found the quality of food and nutrition research has steadily improved since 2000. This is when the research community began to adopt [detailed guidelines](#) for published research.

The research community has done particularly well in minimizing Attrition bias and Reporting bias. It has not been as successful in minimizing Selection bias, Performance bias or Detection bias.

Publication year and study design were more consistent predictors of quality than study funding source. Industry-funded studies were not generally found to be lower in quality. Studies with “combined” funding sources – typically the work of public-private research partnerships – were higher in quality, by and large, than studies with single-source funding. It is widely recognized that there is a benefit to collaboration as experts bring different perspectives to the table.

### **Implications:**

The research community can put these insights into action to increase public trust in food and nutrition research. Based on the findings of the study, these strategies will be most impactful:

- Enhance researcher training on the latest scientific methods and tools to reduce selection, performance and detection ROB;
- Publish nutrition-specific extension of publication reporting guidelines to expressly define ways to reduce ROB; for example, establishing best practices to characterize study subjects’ background diets when examining the impact of a single nutrient;
- Continuously monitor for improvement, perhaps by establishing a new research registry; and
- For enhanced transparency, commit to 100% disclosure of study funding source.

This is the first scientific publication to statistically demonstrate that the guidelines for published research that have been in place since 2000 have been successful. Efforts to improve the quality of food and nutrition research are ongoing. ILSI North America has been working for the past 10 years alongside federal agencies and scientific professional societies to support continual improvement in scientific integrity. For more information, visit <http://ilsina.org/our-work/scientific-integrity/>.

### **Study Authors:**

The research team included scientists from universities, a professional society and individually-owned private consultancies:

- Esther Myers, PhD, CEO, EF Myers Consulting, Inc. (formerly Chief Science Officer, Academy of Nutrition and Dietetics)
- James Parrott, PhD – Associate Professor, Rutgers University (statistician)
- Patricia Splett, PhD – Consultant, Splett and Associates, evaluation consultant (formerly University of Minnesota, School of Public Health)
- Mei Chung, PhD – Associate Professor, Tufts University School of Medicine (system reviews to inform public policy)



- Deepa Handu, PhD – Researcher, Academy of Nutrition and Dietetics, Evidence Analysis Library (EAL)

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