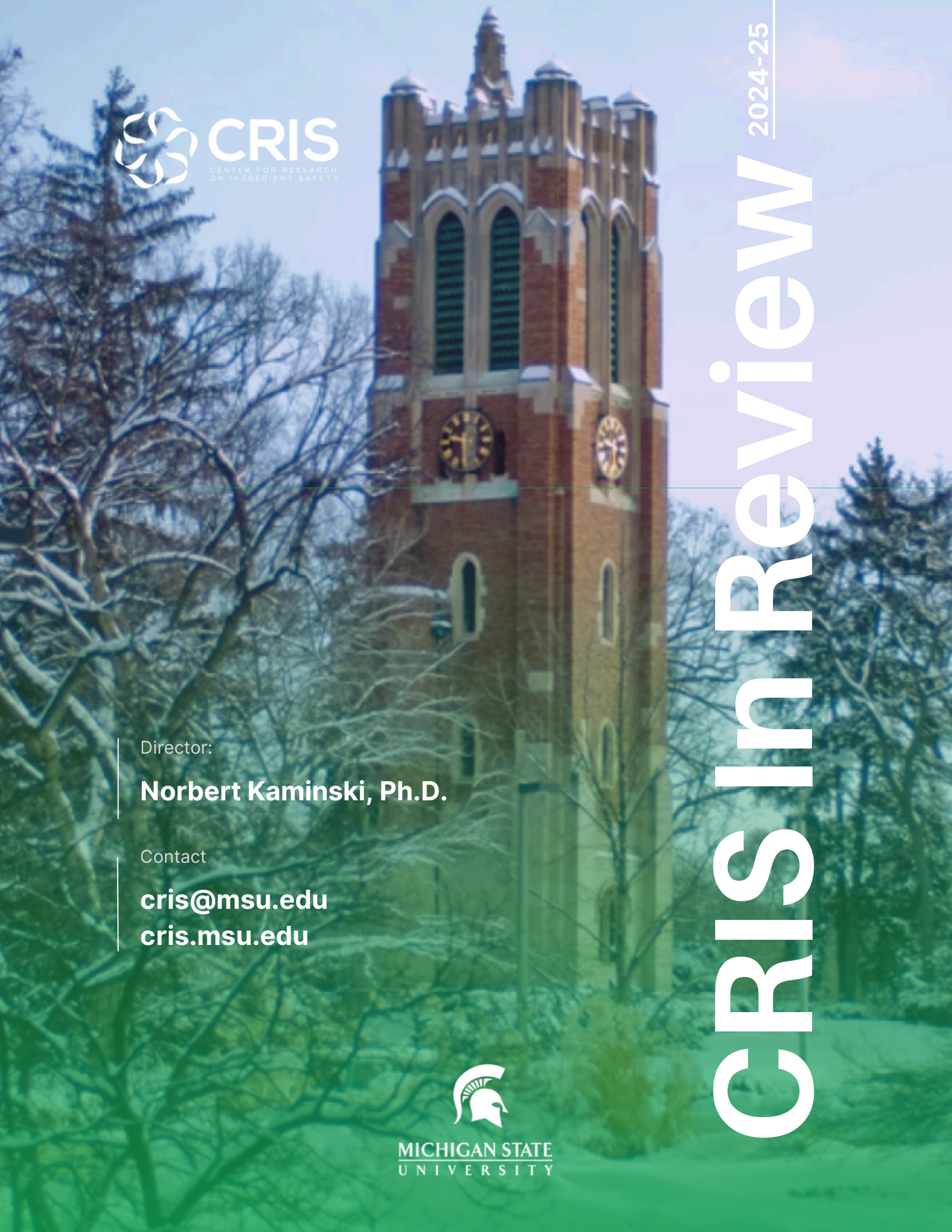

CRIS
CENTER FOR RESEARCH ON INGREDIENT SAFETY

CRIS In Review 2024-25

Director:

Norbert Kaminski, Ph.D.

Contact

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MICHIGAN STATE UNIVERSITY

ABOUT CRIS

The Center for Research on Ingredient Safety at Michigan State University (CRIS) is one of the few organizations in the world willing to tackle the hard questions about ingredient safety in our everyday products.

We are unique in that we work with academia, government, non-governmental organizations, and industry to understand the safe use of ingredients. To be a CRIS Partner, an entity must be willing to submit to our code of ethics of complete transparency and always put the consumers' best interests regarding ingredient safety first.

But how do we ensure these entities have our best interests at heart? How do we know that what they are saying about the ingredients in our everyday products is true?

CRIS fills that void. We use expert knowledge to research, fact-check, and supply the global community with the latest science-based information about the ingredients in our food, beverages, and cosmetics.

When data gaps exist, CRIS conducts laboratory-based research to obtain information on ingredient safety.

We leverage the expertise of established investigators who have devoted their lives work to science, and we demystify dense academic journal findings and governmental reports so you can make informed decisions about the science in our lives.

While this may make us unpopular with some groups, we believe that transparency and truth are requirements to earn your trust, and the confidence of the global community.

MISSION & VISION

Our mission is to conduct research and provide insight into the safety of ingredients in food and consumer products to support evidence-informed decisions by consumers, industry, and policymakers.

Our vision is to ensure credible, relevant information on ingredient safety is accessible to a wide range of decision-makers.

CORE VALUES

We operate using our core values:

- Integrity
- Responsibility
- Transparency
- Inclusivity
- Engagement
- Diversity

THE OBJECTIVE

We at the Center for Research on Ingredient Safety at Michigan State University (CRIS) strive to become the go-to source for information on ingredient safety.

OUR COMMITMENT & OUR ETHICS

We at the Center for Research on Ingredient Safety at Michigan State University (CRIS) believe that science and research should speak for itself. That is why we wrote transparency and accountability into our bylaws and governance practices from CRIS's inception to ensure that we

- produce and disseminate unbiased and credible research data and analysis on the safe use of ingredients in food and consumer products.
- offer unbiased and transparent evaluation of new technology that can be applied to evaluate ingredient safety.
- expand the opportunity to conduct basic and applied research on the safety and toxicology of ingredients in food and consumer products to support the management of potential safety issues.

This also means that the established investigators conducting research at CRIS have final say on all scientific research, including

- driving the research agenda.
- research design, methods, and conduct.
- interpreting and publishing findings in peer-reviewed journals.

To ensure impartiality, all research outcomes from CRIS-conducted projects must undergo the peer review process and are published. Research findings are not shared, including with members, or communicated until accepted for publication in the peer-reviewed literature. All of our research methods and processes are available openly and freely for any person to evaluate.

While our partners can participate in CRIS advisory committees, all final research and communication decisions are made by the CRIS team using the CRIS bylaws and established governance.

Additionally, we follow the code of ethics outlined by Michigan State University.

CRIS MEMBERS

Cargill

Bumble Bee Foods, LLC

Conagra Brands

The Coca-Cola Company

McCormick

The Hershey Company

PepsiCo

P&G

Sherwin-Williams

CRIS TEAM

The Center for Research on Ingredient Safety at Michigan State University (CRIS) consists of a core team of individuals who provide leadership, management, research, educational opportunities, and direction for CRIS activities. In addition to our core team, we're connected to a global network of scientists and researchers available to support CRIS research.

These activities are guided by input from CRIS advisory committees. However, all final decisions are made by the CRIS team.

Norbert Kaminski, Ph.D.

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A NOTE FROM THE DIRECTOR

Photo: Dr. Norbert Kaminski

This past year has been one of accelerated growth and meaningful impact for the Center for Research on Ingredient Safety (CRIS). As public conversations around food, consumer product ingredients, and chemical safety continue to intensify, the need for credible, science-based information has never been more essential. Across research, education, communication, and global engagement, CRIS has strengthened its role as a trusted scientific resource for industry partners, academia, regulatory agencies, journalists, and consumers seeking clarity in an increasingly complex information landscape.

Building on major scientific milestones, CRIS advanced its research portfolio through expanded work in developmental immunotoxicology, the continued refinement of human-relevant testing models, and deeper collaboration across academic, clinical, and international institutions. These efforts reflect CRIS's commitment to advancing evidence-based

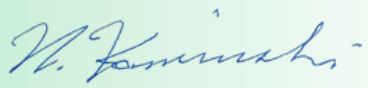
continued

A NOTE FROM THE DIRECTOR CONTINUED

ingredient safety while supporting innovative approaches that improve relevance, reproducibility, and transparency in toxicological science.

Equally important, CRIS expanded its communications and outreach impact to ensure that this science reaches audiences where it matters most. Through national and international media coverage, a robust and growing blog ecosystem, a fast-expanding podcast platform, and strategic speaking engagements, CRIS continues to translate complex research into accessible, actionable knowledge for diverse stakeholders.

This report highlights the achievements that defined the past year and the strong foundation they have established for future progress. Together, these efforts position CRIS to continue leading at the intersection of science, policy, and public understanding as we pursue our mission in the years ahead.



Norbert Kaminski, Ph.D.
Professor, Pharmacology & Toxicology
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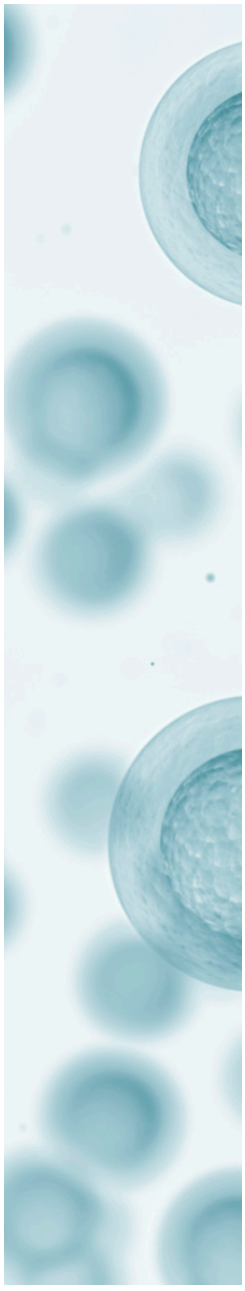
Research Highlights

ADVANCING HUMAN-RELEVANT TOXICOLOGY



CRIS researchers published a paper validating a human cell-based model of immune development, demonstrating that this method accurately reflects how in utero lead exposure affects the developing immune system. This research marks an important step in expanding New Approach Methodologies (NAMs) and reducing reliance on animal models.

Top Takeaways:

- Human cell–based assays can reliably model developmental immunotoxicity.
- Lead exposure findings align with real-world human data.
- NAMs offer a powerful path toward future regulatory science.

> Read the Paper
https://doi.org/10.1016/j.tox.2025.154323

Research Highlights

CLARIFYING MICROPLASTIC RISK

CRIS researchers coauthored a paper in Environmental Science & Technology Letters showing that seafood is not a major source of human microplastic exposure. The paper discusses that exposure from fish and shellfish is comparable to that from other foods and far lower than exposure from indoor air and dust, and that avoiding seafood due to plastic concerns could undermine important nutritional benefits. This manuscript adds critical context to public conversations about microplastics and supports the continued safety of seafood consumption.

Top Takeaways:

- Microplastics are everywhere—in the air, dust, and across foods—not unique to seafood.
- Seafood remains a safe, nutrient-rich component of a healthy diet.
- Avoiding seafood due to plastic fears may cause more harm than good.

> Read the Paper

https://go.msu.edu/rgk5

Research Highlights

PYRROLIZIDINE ALKALOIDS

Pyrrolizidine alkaloids (PAs) are a large group of naturally occurring plant compounds that can contaminate foods such as teas, honey, grains, and some supplements. While high exposures to certain PAs can harm the liver, not all PAs behave the same way. CRIS research used a novel human cell-based liver model to study five specific PAs and found substantial differences in their toxicity and potency. These findings challenge blanket regulatory approaches that treat all 600+ PAs as equally hazardous and instead support a more scientifically grounded, risk-based approach that considers both the specific compound and real-world exposure levels.

Top Takeaways:

- Pyrrolizidine alkaloids are naturally occurring plant compounds, not intentionally added to foods or supplements.
- Health risk depends on both the specific PA and exposure level, not just the presence of PAs.
- CRIS research shows wide differences in toxicity among PAs, meaning they should not be treated as equally hazardous.
- Risk-based regulation using human-relevant data is more scientifically sound than blanket, hazard-only approaches.

> Read the Paper

https://doi.org/10.1016/j.fct.2024.114584

Research Highlights

COLLABORATIVE ALLIANCE

Qualification of the CD34 Cell Developmental Immunotoxicology Assay

With the explosion of NAMs, much of the current discussion in this area has been focused on what will be required to gain broad acceptance of an in vitro assay for regulatory use. It is noteworthy that in the US, in vitro methods that are not fully "qualifited" may be fit-for-purpose for regulatory applications; however, this is determined on a case-by-case basis and is also dependent on the regulatory agency.

CRIS has been participating in a Developmental Immunotoxicology Working Group comprised of immunotoxicologists from government, industry, and academia, led by Dr. Fenna Sille at Johns Hopkins University, to identify and qualify DIT assays.

The DIT assay developed at Michigan State University is presently the lead candidate for qualification.

Presently, four laboratories have agreed to participate in an inter-laboratory validation, which will include Dr. Fenna Sille's laboratory at the Johns Hopkins, Burleson Research Technologies Inc, Health Canada and CRIS at Michigan State University.

In 2023, the four laboratories submitted a proposal to the U.S. Food and Drug Administration (FDA) seeking funding to further continue research to conduct cross comparison of the assay.

The proposal which was submitted to the FDA but was not funded at this time.

JOHNS HOPKINS
UNIVERSITY

Research Highlights

SCIENTIFIC ENGAGEMENT

CRIS researchers engage with scientific, industry, and professional audiences to share research findings, advance dialogue on ingredient safety, and support evidence-based decision-making. These engagements highlight CRIS's commitment to transparent science, human-relevant methods, and practical application across sectors.

CRIS experts were invited to present at major national and international forums, including:

- **American Frozen Foods Institute Annual Meeting** – Invited presentation
- **Corteva NAMs Group** – Briefing on New Approach Methodologies
- **EuroToxicology Meeting** – Presentation on further characterization of CRIS's stem cell model system using dioxin-like compounds
- **Food Research Institute Meeting** – Presentation on pyrrolizidine alkaloid (PA) research
- **Frozen Food Manufacturers Association** – Invited presentation on ingredient safety
- **International Union of Toxicology (IUTOX) 17th International Congress of Toxicology (ICT), Beijing, China** – Co-chaired by Dr. Kaminski, Program Committee Selection
- **UIC PEHSU Meeting** – Presentation on CRIS lead exposure research
- **Whole Foods Market** – Workshop on introductory toxicology and heavy metals

CRIS Activities

ENGAGEMENTS: RESEARCH & OUTREACH

CRIS Annual Meeting & Science Symposium

The 2025 CRIS Science Symposium brought together leading experts in nutrition, toxicology, science communication, and journalism to explore how chemical ingredient safety can be effectively communicated to diverse audiences.

Featured Speakers and Presentations

Bridging the Gap: Integrating Ingredient Safety into Everyday Nutrition Messaging
Joanne Slavin, Ph.D., R.D. | University of Minnesota

Risk, Dose, and Trust: Making Chemical Safety Concepts Make Sense to Non-Experts
Anne Chappelle, Ph.D., DABT | SafeBridge Consultants

Storytelling That Works: Communicating Ingredient Safety in the Digital Age
Jessica Steier, Dr.PH. | Unbiased Science

Chemicals in the News: Ingredient Safety Through the Lens of Journalism and the Click Economy
Jill Adams, Ph.D. | The Washington Post

Communicating Effectively and Strategically in the Context of Chemical Ingredient Safety
John Besley, Ph.D. | Michigan State University

> Watch the Symposium
https://go.msu.edu/2mk5

Communication Highlights

COMMUNICATION & PUBLIC ENGAGEMENT

CRIS significantly expanded its public-facing communication footprint, strengthening trust, access, and public understanding.

CRIS experts were invited to present at major national and international forums, including:

- **International Food Information Council Annual Summit** – Addressing rising fears about chemicals in food
- **Science Talk '25** – Workshop on TikTok trend forecasting and mis/disinformation
- **International Association for Food Protection Annual Meeting** – Ingredient safety perspectives from toxicologists
- **Household & Commercial Products Association Meeting** – Applying science communication in practice
- **Personal Care Products Council Annual Meeting** – Two sessions on value chains and science storytelling
- **ILSI U.S. & Canada Annual Symposium** – Communication challenges in the modern food system
- **JIFSAN–CFS3 Advisory Council Symposium** – Navigating ingredient misinformation online
- **Personal Care Products Council Annual Fall Meeting** – Panelist

Communications Highlights

CRIS IN THE MEDIA & NEWS

Our approach to ensuring our content is universally accessible and optimized for search engines makes it easy for the media to engage with CRIS experts.

Associated Press: "Do drinks that are meant to do more than taste good actually provide any health benefits?"
> Read the article

Bon Appétit: "Stanley Cups Apparently Contain Lead. Here's How Worried You Should Be"
> Read the article

Chemical & Engineering News (C&EN): "Girl Scout cookies are safe to eat, scientists confirm."
> Read the article

Inside Climate News: "Does the Insect Repellent DEET Affect Reproductive Systems?"
> Read the article

Modern Retail: "Unpacked: How brands are complying with California's new baby food transparency law"
> Read the article

National Public Radio (NPR), Planet Money: "Crumbling Trust in American Institutions: A MAHA activist takes on Girl Scout cookies"
> Read the article

New York Post: "You're probably eating sunscreen — this common cosmetic ingredient is also used as a food additive"
> Read the article

New York Times: "What's the Best Way to Do Laundry?"
> Read the article

Communications Highlights

CRIS IN THE MEDIA & NEWS CONTINUED

Politifact: "Are Girl Scout Cookies Toxic? No, Experts Say Study's Findings Are Misleading"
> Read the article

New York Times, Wirecutter: "Cutting Boards"
> Read the article

New York Times, Wirecutter: "Non-stick Coatings"
> Read the article

Reuters: "Baby food makers are failing California's lead standards, Reuters review shows"
> Read the article

The Daily Beast: "Can Non-Alcoholic Drinks Really Give You a 'Buzz'?"
> Read the article

The Today Show: "Risk of black plastic utensils"
> Watch now

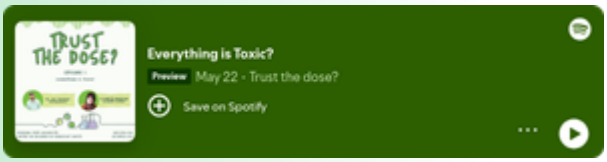
The Washington Post: "How plastic hides in supposedly eco-friendly laundry products"
> Read the article

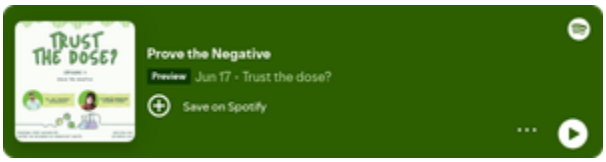
Communications Highlights

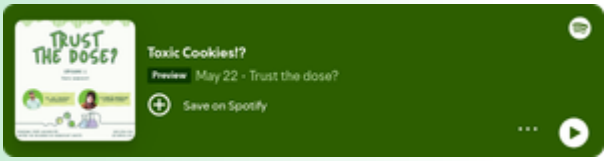
CRIS PODCAST LAUNCH

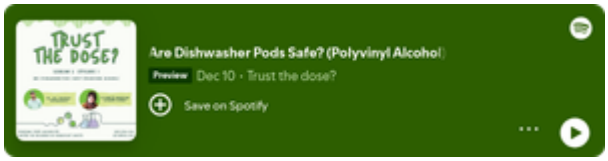
TRUST THE DOSE?

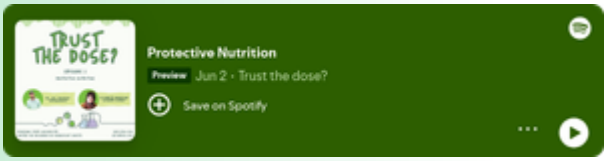
Trust the Dose? is CRIS's science communication podcast focused on making ingredient safety, toxicology, and risk assessment understandable for non-expert audiences. Now in its second season, the podcast features conversations with CRIS researchers that connect peer-reviewed science to real-world questions about food and consumer products. Through clear, evidence-based discussion, *Trust the Dose?* supports informed decision-making and reinforces CRIS's role as a trusted voice in ingredient safety.

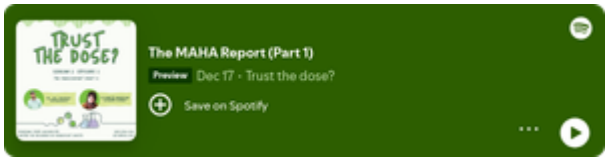












Communications Highlights

CRIS & MAHA

DEMONSTRATING A DECADE OF LEADERSHIP IN INGREDIENT SAFETY SCIENCE

In 2024, the release of the Make Our Children Healthy Again (MAHA) Report brought renewed national attention to issues surrounding food, nutrition, chemical exposures, and ingredient safety. While the report elevated these topics in public discourse, many of the scientific questions it raised have long been central to the Center for Research on Ingredient Safety (CRIS) 's work.

For nearly a decade, CRIS has conducted research, developed educational resources, and published science-based explanations addressing the very concepts highlighted in the MAHA Report. Rather than responding reactively, CRIS created a dedicated resource that maps existing CRIS research and communication—published years prior—to the themes outlined in the MAHA Report. Our approach demonstrates CRIS's sustained leadership and long-standing relevance in ingredient safety science.

Furthermore, this effort reinforces CRIS's role as a proactive scientific authority that anticipates emerging issues and builds the foundational knowledge needed to support informed public understanding.

Communications Highlights

CRIS & MAHA

CONTINUED

To illustrate alignment between CRIS's long-standing work and the MAHA Report, at CRIS we developed detailed tables linking report themes to peer-reviewed research, educational explainers, and public-facing content published over the past decade. A simplified summary of this alignment is shown below.

Alignment Between MAHA Report Themes and CRIS Content & Research

MAHA Topic Area	CRIS Focus Areas
Heavy Metals	Lead, cadmium, exposure thresholds
Endocrine Activity	Dose-response relationships, biological mechanisms
Plastics & Polymers	Microplastics, migration, exposure pathways
Pesticides	Residue levels, risk assessment frameworks
Food Additives	Regulatory context, safety evaluation
Nutrition & Food Tradeoffs	Risk–benefit context in food choices

> Read full MAHA-mapped content
https://go.msu.edu/maha

CRIS EXTERNAL SCIENTIFIC ADVISORS

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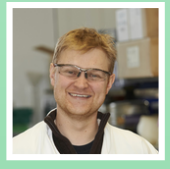

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George Pugh, PhD
Coca-Cola Company

Michael Rizzo, PhD
PepsiCo, Inc.

Robert Sills, DVM PhD
National Institute of Environmental Health Sciences

David Tonucci, PhD
Michigan State University

THANK YOU

We extend our sincere appreciation to our members for their continued commitment and collaboration. Your engagement plays a vital role in shaping the direction and impact of CRIS, and the expertise and perspectives you bring strengthen every aspect of our work.

Your ongoing support makes it possible for CRIS to advance research and deliver clear, science-based insights on the safety of food and consumer product ingredients. Together, we help inform responsible decision-making for consumers, industry leaders, and policymakers.

We look forward to building on this partnership in the year ahead as we continue working toward a safer, healthier future through evidence-driven science.

The CRIS Team

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