

IAFNS Food and Chemical Safety Committee Request for Proposals

Relationship between soil characteristics and toxic element levels in food crops

The Institute for the Advancement of Food and Nutrition Sciences (IAFNS) is a non-profit, 501(c)(3) scientific organization that pools funding from industry collaborators and advances science through the in-kind and financial contributions from public and private sector participants. IAFNS adheres to strict procedures to maintain scientific integrity in all work we support. These requirements are described further in the attached TOP Guidelines and Guiding Principles for Scientific Integrity addendums.

Issue to be addressed:

Mitigations for managing toxic elements (e.g., lead, arsenic and cadmium; sometimes termed heavy metals) are deployed throughout the agricultural and food supply chain to minimize their presence. These efforts by growers, ingredient suppliers, and food manufacturers align with public health efforts and regulatory agency activities, such as FDA's Closer to Zero initiative. Since these elements are often found in foods that are part of a healthy diet, defined action levels must balance minimizing exposure to these elements with the availability, predictability and affordability of the supply of nutritious foods.

This project will build upon recent work funded by IAFNS that identified a critical need for a deeper understanding of the interrelationships among soil characteristics, mitigation options and resulting levels of toxic elements in plants and commodities. This need was also confirmed via discussions with FDA and other stakeholders. This project will address key questions around how soil levels of toxic elements are impacted by soil characteristics to affect potential transfer to crops while also investigating the distribution and variability of these elements in specific crops across growing regions.

Objectives:

1. Characterize the distribution and variability of toxic elements in selected food crops across key US growing regions. This can be accomplished by targeting 1-2 key food crops grown across diverse/representative growing regions.
2. Establish relationships among these results, soil levels where the crops are grown, and soil characteristics that can impact translocation to plant parts.
3. Leverage these findings to identify new mitigations and refine existing ones to optimize effectiveness and alignment with accepted growing practices to maintain access to safe and affordable foods.

**Scope:**

Heavy metals/toxic elements in foods that are subject to regulatory review under FDA's Closer to Zero initiative. Heavy metals/toxic elements in drinking water are NOT in scope.

Deliverables:

- The primary deliverable is 1-2 high-impact publications in a peer reviewed journal.
additional deliverables:
- Quarterly updates to the IAFNS Food and Chemical Safety Committee
- One to two presentations at appropriate scientific conferences

Proposal Content:

1. **Approach:** Please provide your approach to the research design elements. Identify key research questions, outcomes, methodology, and analysis plan. Where appropriate, please reference the validation of proposed methods.
2. **Anticipated Challenges**
3. **Research Team:** Please indicate the primary (and secondary) investigators, plus any additional contributors or collaborators.
4. **Investigator Credentials and CV of the principal investigator(s).**
5. **Potential Conflicts of Interest:** List any potential conflicts of interest for all investigators, co-investigators, collaborators. We suggest using the Conflict of Interest Guidelines as set forth by the American Society for Nutrition:
<https://nutrition.org/publications/guidelines-and-policies/conflict-of-interest/>
6. **Budget:** Please provide a budget summary. IAFNS will cover costs of open access publication fees. IAFNS has a target maximum of \$100,000. Deviations from this target can be considered if justified by the proposed research. Indirect costs of up to 10% of total direct costs will be considered for the management of the research project by the sponsoring institution and should be included in the total budget.
7. **Timeline of Key Deliverables:** IAFNS endeavors to complete projects in an aggressive yet timely manner.
8. **Page Limit:** No more than 3-4 pages excluding references and investigator CVs.

Deadline: Oct 31, 2024

Submission Instructions: Please submit completed proposals to:

Neal Saab, PhD
Senior Science Program Manager
nsaab@IAFNS.org

Proposal Review Process:

- a) Proposals will be reviewed promptly by the Food and Chemical Safety Committee.



- b) The review process will consider investigator credentials, fit with objectives, timeliness of deliverables, fit for budget and expected impact of the research.
- c) Applicants will be notified by email if additional information is needed.
- d) Once the review process is over, all applicants will be notified of the disposition of their proposals in a timely manner.
- e) Upon initiation, the project summary and awarded institution will be published on our funded projects portal: <https://iafns.org/funded-projects/>

References:

1. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-action-levels-poisonous-or-deleterious-substances-human-food-and-animal-feed#lead>
2. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-action-level-inorganic-arsenic-rice-cereals-infants>
3. <https://www.fda.gov/food/cfsan-constituent-updates/fda-response-questions-about-levels-toxic-elements-baby-food-following-congressional-report>
4. <https://www.fda.gov/food/metals-and-your-food/closer-zero-action-plan-baby-foods#:~:text=The%20U.S.%20Food%20and%20Drug,to%20as%20low%20as%20possible.&text=the%20type%20of%20food%20crop,elements%20from%20the%20environment%2C%20and>
5. Review of Regulatory Reference Values and Background Levels for Heavy Metals in the Human Diet (2022). Candace Wong, Stephen M. Roberts, Neal Saab Regulatory Toxicology and Pharmacology 130: 105122-105132.
<https://www.sciencedirect.com/science/article/pii/S0273230022000095?via%3Dihub>