

Institute of Food Technologists

Comments of the Institute of Food Technologists on the NSET research priority document and public meeting Jan 4, 2007

The Institute of Food Technologists (IFT) commends the NSET committee on its document *Environment, Health, and Safety Research Needs for Engineered Nanoscale Material* and the National Nanotechnology Coordination Office for convening the public meeting. Members of our Working Group on Nanostructured Materials in Food attended the public meeting and have reviewed the document. In general, the approach presented for addressing and prioritizing the research needs for nanotechnology seems sound and acceptable for the needs of the IFT membership. IFT is a not-for-profit science society representing 22,000 food scientists and technologists in industry, government and academia.

The purpose of this statement is to encourage the committee to consider and explore research issues that are of particular importance to the environmental, health and safety research needs for engineered nanoscale materials that are relevant to food. We believe that because every person must consume food on a daily basis, there is likely to be great public interest and concern regarding the potential health benefits and safety issues of nanostructured materials in foods. The IFT working group would welcome the opportunity to work with the NSET committee to address these issues and ensure they are encompassed in the future research priorities.

It is important to consider that nanostructured materials for use in foods will likely have greater use and exposure potential than other applications (e.g. specific cancer drugs) because the technology may be targeted towards the general population of healthy retail food consumers.

Specific research needs that are relevant to food include the following:

- 1) Food-related nanostructured materials have the potential to reduce currently existing food safety problems and nutritional issues in food, thereby improving overall nutritional and health benefits of the current food supply. Examples include enhanced bioavailability of nutrients (vitamins & minerals), reduced potential for microbial spoilage, and improved retail product quality (taste, appearance, and shelf stability). Allocation of federal research funds to researchers working to develop these beneficial applications and solve food safety problems through applications of nanostructured materials is needed.

For additional information on potential food applications please refer to IFT's scientific status summary "*Functional Materials in Food Nanotechnology*"

<http://members.ift.org/NR/rdonlyres/FA9DE19E-1AFF-4B94-9012-CDAC3C45B0FF/0/Nanotech.pdf>

- 2) The physicochemical properties of nanostructured food materials, e.g., size, shape, surface chemistry, solubility properties, etc., that determine functionality in foods and physiological behavior of these materials upon ingestion is needed as a preliminary step towards the design of criteria for safe and beneficial nanoscale food structures.
- 3) Researchers working with food-related nanostructured materials require access to federally-funded research facilities that have state-of-the-art equipment for characterization and fabrication of nanostructured materials, such as the nanotechnology characterization laboratory (NCL) facility (see <http://ncl.cancer.gov/>) that is currently available to drug researchers. The researchers can have their nanomaterials tested for toxicity effects at no cost. Such facilities are needed to allow academics and industry working on development of nanostructured materials for applications in food to adequately characterize the materials used in their research.
- 4) Development of a testing framework to validate safety of food nanostructured materials is urgently needed. The National Cancer Institute (NCI) has worked in collaboration with the Food and Drug Administration (FDA) to establish which tests are needed for FDA approval and has established a program whereby companies and academic researchers can have these materials evaluated. In contrast, the food industry has yet to establish or gain support for test guideline and protocol development, as well as analytical methodology creation and validation.
- 5) Although nanostructured materials have long been a component of foods, as part of their normal molecular architecture, research is needed to differentiate between naturally occurring nanomaterials or those resulting from normal food processing and the engineered ones that are added to food. Assessment of the various applications and development and application of a screening mechanism to assess their safety could be beneficial to the entire field of nanotechnology.
- 6) There is an urgent need to develop approaches to understand the interaction between non-food nanotechnology and food products, e.g., migration, absorption, adsorption, partitioning from packaging and the environment.
- 7) Funding for public education is critically needed immediately to effectively communicate to the public accurate and research-based scientific information on nanostructured materials in food and food applications. There are numerous examples of the rejection of new technologies that have the potential to provide health and safety benefits to the food and agricultural communities, because of unfounded public concern borne from fear and exaggerated risk perception.

To avoid repeating history and subsequent unwarranted fear and rejection of nanostructured materials in foods, we urge the NSET to be proactive and provide the food and agriculture communities the funding and resources needed to address the issues above. Responsible scientists in industry and academia are anxious to generate the data needed to ensure the safe and responsible use and development of nanostructured materials for food and food industry applications, as we recognize the great potential for improvement of the safety and nutrition of the food supply both in the US and worldwide.

If additional information is needed, please contact one of the following members of the IFT Working Group on Nanostructured Materials in Food.

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