FOOD Manufacturing

Q&A: Weighing The Risks Of Nanotechnology

January 3, 2012

Interview by Lindsey Coblentz, Associate Editor with Amy Galland, Ph.D., Research Director, As You Sow

Nanotechnology is an emerging science that offers many new opportunities for the food industry, but food manufacturers should be aware that there are some potential risks with this new technology. *Food Manufacturing* spoke with Amy Galland of As You Sow about nanotechnology and what processors should consider before implementing this new science into their processes.

Q: What is nanotechnology?

A: Nanotechnology is the science of manipulating matter at the molecular scale to build structures, tools or products, known as nanomaterials. Materials reduced to the nanoscale either through engineered or natural processes can suddenly show very different properties compared to what they exhibit on a macroscale, enabling unique applications such as alterations in color, electrical conductance or permeability.

Q: What are the possible risks and benefits of nanotechnology to the food industry?

A: The risks and benefits of this emerging technology are still being discovered, yet the development, use and manufacturing of nanomaterials are being conducted with little transparency and inadequate regulatory oversight. This is particularly concerning to the food industry, where human exposure is virtually guaranteed. The food industry is reported to be extensively researching and developing the use of nanomaterials, however there is little known about the extent to which nanomaterials are used in food products, processing or packaging. Among uses, nanomaterials could be introduced in pesticides, to make enhancements to food products or flavorings or to extend shelf-life.

Q: What current regulations are in place for nanomaterials? Is more regulation needed? If so, who should provide these rules, and what guidance should be provided, especially when it comes to the food industry?

A: In June 2011, the Food and Drug Administration (FDA) stated that it "believes that evaluations of safety, effectiveness or public health impact of such products [containing nanomaterials] should consider the unique properties and behaviors that nanomaterials may exhibit," but did not put forth specific guidelines for evaluating nanomaterials or products containing nanomaterials; the FDA instead affirmed that agencies will adhere to the Principles for Regulation and Oversight of Emerging Technologies.

In June 2011, the EPA proposed a policy to collect information on nanomaterials in pesticides. The EPA effort, if approved, will determine "whether the registration of a pesticide may cause unreasonable adverse effects on the environment and human health." This follows the agency's April 2010 announcement that it would issue new regulations that would treat nano-antimicrobials used in food processing and other processes as new pesticides. The latter regulation has been held up at the Office of Management and Budget.

The Project on Emerging Nanotechnologies (PEN) at the Woodrow Wilson International Center for Scholars and the Grocery Manufacturers Association, in a joint report, found that the "FDA and EPA pre-market reviews do not […] address the full range of circumstances in which possible adverse impacts could occur and in which preventive efforts are appropriate."

Yes, there should be more regulation of nanomaterials. Nanomaterials in food fall under the FDA, but in pesticides and

packaging they are under the rubric of different laws in other regulatory agencies — so there needs be an integrated approach to nanomaterials in order to assure the safety of the food supply.

Q: What considerations should manufacturers take when deciding whether or not to source products containing nanomaterials?

A: They can survey the supply chain to get an understanding of the risks involved by:

- Assuring transparency through the supply chain
    - Companies should insist upon full transparency on nanomaterials that will be in direct contact with their customers, either through ingestion or exposure. They should also require transparency throughout their supply chains on nanomaterials, testing, and management.
- Receiving details on materials
    - Information on the materials, and particularly risks, related to human exposure is critical to the food industry where exposure is inherent to the product's use. Companies should request information from their suppliers on the nanomaterial in the products and those used to make products.
- Obtaining data on risk at different levels of uncertainty
    - To assure safety, companies should require full testing data related to exposure via ingestion, the skin, inhalation and other membranes, including how each nanomaterial behaves as it travels through the body. In addition, companies should require testing data on a nanomaterial's potential impact on the ecosystem after the manufacturing process or end-of-life of packaging.

On emerging technologies, it is critical that companies engage with stakeholders and, when appropriate, enter into stakeholder dialog in conjunction with suppliers.