

Consumer Attitudes and Labeling Regime Key to the Market Potential of Food Nanotechnology

The use of nanotechnology in all phases of the food cycle – from farm to fork – has the potential to revolutionize the agri-food sector by increasing food supply and enhancing food quality and safety. Applications include: nanosensors for monitoring crop growth and pest control; additives and ingredients that enable changes in food texture, taste, processability and quality; packaging material that release preservatives to extend food life and improve food safety by signaling whether food is contaminated or spoiled. While the potential benefits of food nanotechnology can be immense, its potential risks, including possible toxicity of nanoparticles, are not well understood.

Research shows that, even though most consumers lack knowledge and understanding of the technology, they nevertheless have strong opinions as to its potential risks and benefits. Advocates are determined to not repeat the mistakes of biotechnology. Understanding the factors determining the market acceptance of food nanotechnology and its potential impact on the different interest groups involved can inform the design of effective policies and strategies governing food nanotechnology innovations.

CAFIO-PRG Research

A CAFIO-PRG study examines the determinants of market acceptance and success of food nanotechnology innovations and the welfare effects of their introduction for the interest groups involved (i.e., consumers and suppliers of nanofoods and their conventional and organic counterparts) under different labeling regimes. In so doing, the study explicitly accounts for the, empirically relevant, (1) differences in consumer attitudes towards interventions in the production process, and (2) imperfect competition in the supply channels of interest.

CAFIO-PRG Findings

The CAFIO-PRG research shows that:

- The market and welfare effects of the introduction of food nanotechnology innovations are case-specific and dependent on (a) consumer attitudes towards the use of nanotechnology in food production, (b) consumer valuation of the enhanced attributes of nanofood innovations, (c) the labeling regime governing food nanotechnology, (d) processor/retailer adoption costs, and (e) the degree of competition in processing/retailing.
- High consumer valuations of the enhanced attributes of nanofoods (e.g., enhanced food quality or/and safety) can lead to the market acceptance and success of food nanotechnology innovations even when consumers are averse to the use of nanotechnology in food production.
- The introduction of a labeling regime can be detrimental to the market acceptance and success of nanofood innovations when consumer aversion to nanotechnology or/and segregation and labeling costs are high.
- The introduction of food nanotechnology innovations that offer enhanced food quality and/or food safety can be beneficial for all consumers.
- Producers of conventional and organic food products lose from the introduction of food nanotechnology.

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