



United States
Department of
Agriculture

National Institute
of Food
and Agriculture



BIOENERGY, CLIMATE,
AND ENVIRONMENT



FOOD PRODUCTION
AND SUSTAINABILITY



YOUTH, FAMILY,
AND COMMUNITY



FOOD SAFETY
AND NUTRITION



INTERNATIONAL
PROGRAMS



USDA NIFA

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A4131: Enhancing Food Safety through Improved Processing Technologies

AFRI Food Safety Challenge Area

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New Approach (FY 2010)

Focus + Scale = Impact



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Stakeholders' Assessments of Knowledge Gaps



The poster features a central image of a fork piercing a tomato and a cucumber slice. The background is a warm, yellow-orange gradient with faint images of various fruits and vegetables. The text is arranged in a clean, professional layout.

"This workshop will facilitate the development of a common agenda among scientists from Government, Academia and Food Industry in Emerging Technologies and to strengthen links among all people interested in the subject..."

EMERGING FOOD PROCESSING TECHNOLOGIES WORKSHOP

FROM THE LAB BENCH TO THE TABLE

Emerging Technologies

- Nonthermal Technologies
 - High Hydrostatic Pressure
 - Pulsed Electric Fields
 - Ultrasound
 - Ultraviolet
 - Radiation
 - Ozone/CO₂
- Thermal Technologies
 - Microwave
 - Radio frequency
 - Ohmic Heating

Further information:

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Barbosa-Canovas, Bermudez-Aguirre, and Chen, 2008. An Update on Emerging Food Processing Technologies in North America, Special Issue, Food Science and Technology International



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Vision Statement

A Center of Excellence for Innovating Food Processing Technologies (led by Dr. Dennis Heldman)

“To facilitate commercialization and communication for innovative food processing technologies through collaboration among university researchers, governmental agencies and industry users, in the research, development, design and application of processes for safe food products with enhanced food quality attributes and consumer acceptance”





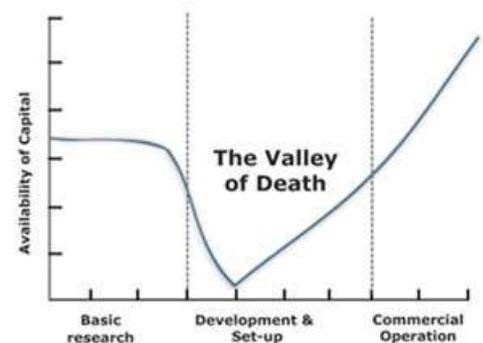
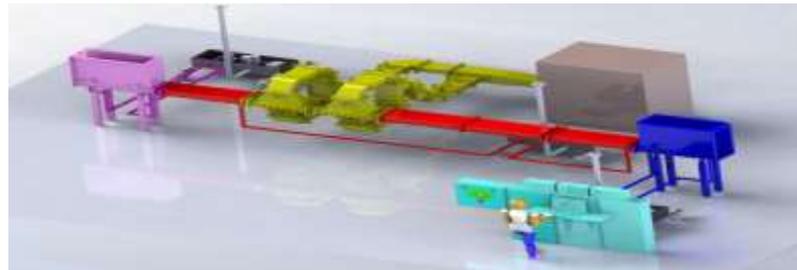
Food Processing Technologies

- Develop and/or improve thermal and non-thermal processing technologies for effective decontamination and inactivation of pathogens in food and food products.
- Develop strategies to prevent cross contamination during one or more of the following: processing, packaging, transportation and/or storage.

up to \$5M/project

FY2010, 3 projects; and

FY2014, 3 projects, plan 2 FASE projects





Food Processing Technologies

1. *MW assisted pasteurization (MAPS)*
2. *Infrared (IR) heating*
3. *Radio frequency (RF) heating*
4. *Ultra violet (UV) radiation*
5. *EO water wash*
6. *Levulinic acid with sodium dodecyl sulfate (LA-SDS) wash*
7. *UV activated titanium dioxide (UV-TiO₂) nanoparticle coating*
8. *High pressure processing*
9. *Pulsed light*
10. *Cold plasma*
11. *Ionizing irradiation*
12. *Ozone*



Advance Technology to Marketplace through PPP

- Encourage to develop technology system prototypes and scale-up
 - Theoretical and experimental validation of effective processes
 - Demonstration of versatility for processing different food products
- Research consortium will be comprehensively multidisciplinary approach led by academic leading experts, and including industry R&D personnel and **regulatory agency from get-go**
- The goal is to further develop, and subsequently promote the use of, innovative and sustainable food processing technologies that improve food safety, and enhance or retain food quality and nutritional value.

WSU 15 kW 915 MHz Single-mode MAPS system (finalized in June, 2013) operating at ambient pressure

