

**Institution:** Iowa State University

**Participants:** Aubrey Mendonca, Terri Boylston, Byron Brehm-Stecher, Cheryl Reitmeier, Lester Wilson

**Introduction:** Research is being conducted to improve the microbial quality and safety of fresh produce. Efforts are being made to increase the antimicrobial effectiveness of foodgrade chemical sanitizers for killing pathogens on the skin surface of cantaloupes and apples with the aim of reducing contamination of the fresh-cut fruit. Hydrogen peroxide, selected surfactants, and organic acids alone or in combination are being tested for improving the microbial quality of cantaloupe, apples, lettuce and almonds. Also, the effectiveness of low dose irradiation is being evaluated for eliminating microbial contamination on the outer rind surface of cantaloupe. The main objective is to develop and evaluate novel approaches for assuring the quality and safety of fresh-cut vegetables.

## Activities

**Objective 5:** Evaluate and control unintentional and intentional microbial contamination of intact and fresh-cut produce.

- 5.1. Determine efficacy of selected chemicals for destroying *Salmonella* and *Escherichia coli* O157:H7 on cantaloupe skin and whole apples
- 5.2. Determine the fate of pathogens on the outer rind surface of cantaloupe and whole apples following sequential application of chemical washes and low dose irradiation
- 5.3. Evaluate the impact of selected antimicrobial treatments on quality characteristics of cantaloupe and apples

## Work in Progress

Experiments are being conducted to enhance the antimicrobial activity of selected organic acids, hydrogen peroxide and sodium bicarbonate buffer solutions against human enteric pathogens on fresh produce including whole cantaloupe and raw almonds. This approach involves evaluating the antimicrobial efficacy of these antimicrobials in combination with various concentrations of chelating agents. The effectiveness of applying antimicrobial wash solutions followed by ozonation or low dose irradiation to destroy pathogens on fresh produce is being investigated along with the influence of antimicrobial interventions on microbial shelf-life and selected quality attributes (including color, texture, etc) of the fresh produce.

## Publications

Orozaliev, A., and A. Mendonca. 2005. Inactivation of *Salmonella* spp. and *Escherichia coli* O157:H7 on cantaloupe skin using citric acid, hydrogen peroxide and a foodgrade

surfactant. Abstract P2-42, International Association for Food Protection Annual Meeting, Baltimore, Md., August 14-17, 2005

Orozaliev, A. Efficacy of selected chemicals and electron beam irradiation for destroying *Escherichia coli* O157:H7 and *Salmonella* on cantaloupe skin. M.S. Thesis, Iowa State University, 2005.

Mendonca A., and A. Orozaliev. Combined effectiveness of hydrogen peroxide and a food-grade surfactant for destroying *Salmonella* and *Escherichia coli* O157:H7 on whole cantaloupe. Abstr. 016-06. IFPA Annual Meeting on April 26-29, 2006.