

Project No. and Title:	S-294 - Postharvest Quality and Safety in Fresh-Cut Vegetables and Fruits
Period Covered:	04-2006 to 04-2007
Date of Report:	30-May-2007
Annual Meeting Date:	28-April-2007

COOPERATIVE STATE STATIONS AND OTHER AGENCIES:

Participants: F.M. Woods - Auburn University; Luke R. Howard - University of Arkansas; D. Barrett, M. Cantwell, Linda J. Harris, Adel Kader, Mikal Salveit - University of California, Davis; Jerry A. Bartz, Jeffrey Brecht, Donald J. Huber, S. A. Sargent - University of Florida; Larry Beuchat, William C. Hurst, Mark A. Harrison - University of Georgia, Athens; Aubrey Mendonca, Terri Boyston, Byron Brehm-Stecher, C. Reitmeier, L. A. Wilson - Iowa State University; Randolph M. Beaudry - Michigan State University; Witoon Prinyawiwatkul – Louisianan State University; Chang Y. Lee – Cornell University, Geneva; Jinhe Bai - Oregon State University; Alejandro Castilo, Luis Cisneros-Zevallos - Texas A&M University; Jorge Fonseca - University of Arizona; Mosbah M. Kushad, Hao Feng - University of Illinois; John Mount - University of Tennessee; Elizabeth A. Baldwin, Anne Plotto - USDA-ARS, Florida; J. C. Beaulieu - USDA-ARS, Louisiana; B.A. Annous, Xuetong Fan, Gerry Sapers (retired) - USDA-ARS, Pennsylvania; Kenneth C. Gross, Moon S. Kim, Alan M. Lefcourt, Yaguang Luo, Robert Saftner - USDA-ARS, Maryland; Tara H. McHugh, Mendel Friedman, Roberto de Jesus Avena-Bustillos - USDA, ARS, WRRRC; Peter M.A. Toivonen, Jennifer DeEll, Margaret A. Cliff, Susan J. Bach, P. J. Delaquis - Agriculture and Agri-Food Canada; Vasantha Rupasinghe - Nova Scotia Agricultural College, Canada; Maria Isabel Gil - CSIC, Spain; Maria Teresa Sanchez - University of Cordoba, Spain; Vlasta Pilizota - University J.J. Strossmayer in Osijek; Giancarlo Colelli - University of Foggia, Italy

Brief Summary of Minutes of Annual Meeting:

The Annual Business Meeting began at 12:40 pm on Saturday, April 28, 2007

Motion passed to approve minutes of the 2006 annual business meeting.

Old Business

1. Relocation of S294 website to the UC Davis Postharvest Outreach Website.

The website was relocated through the cooperative efforts of Jeffery Brecht and Adel Kader. The process of updating personal profiles for S294 participants was initiated, but is yet to be completed.

New Business

1. Report of administrative adviser, Reuben Moore

Dr. Moore said S-294 is the most productive among all groups in the Southern Association of Agricultural Experiment Station Directors' projects. He welcomed industry representatives

attending the meeting (Susan Butris, Sunkist Taylor LLC; Bob Elliott, Sunkist Growers, Inc; Art Davis, Sholl Group/Green Giant Fresh; Valerie Hannig, The Oppenheimer Group; David Gombas and Jim Gorny, United Fresh Produce Assoc; Ozgur Koc, Earthbound Farms). There are 76 members for the S-294 project, one of the largest ones. The USDA has proposed a \$100 million Specialty Crop research Initiative and \$10 million for organic research. Reuben suggested that S-294 scientists may apply for the Specialty Crop research fund when available.

Reuben wanted to make sure that we are working on each objective of the project and asked whether we need to make any change on the objectives. He would like to be notified about significant impacts.

2. Remarks from David Gombas, Vice President of UFPA

The quality of the science symposium and food irradiation symposium was considered to be quite high. The attendance was also high at the food safety summit sessions.

David asked about opinions about the poster section and research pavilion. Alan Lefcourt proposed to change the location and orientation of posters to attract more people. Mikal Saltveit suggested setting up the posters in the lunch area. John Beaulieu believed that having the ARS booth was a big success, giving industry people a place to go for information, so that we did not have to look for people. Jeff said he spent the whole time manning the booth, no time to participate in other sessions. There is a challenge to find enough people to man the booth. Yaguang Luo suggested an S-294 booth for next year's FreshTech meeting. Diane agreed. Alan Lefcourt suggested that a message board (or similar mechanisms) should be established so that those with specific requirements about technical problems can meet with scientists with expertise and solutions.

David said we had 19 posters presented this year. The quality of posters is very good. The judges had a difficult from making the decision on the best poster. This year's winner of best poster goes to Yaguang Luo and her group.

3. Nomination and election of incoming secretary

John Beaulieu nominated Ann Plotto for the position and she accepted. There were no other nominations and Ann was voted into the position of secretary for the upcoming year. Xuotong Fan moves up to vice-chair and Aubrey Mendonca moves up as chair.

4. Oral Reports from S-294 Participants

The following participants presented reports on research at their reprehensive institutions for the 2006-2007 reporting period.

Anne Plotto reported on quality and flavor research at USDA, ARS Citrus & Subtropical Products Lab.

John Beaulieu reported on antimicrobial activities of CPC and ASC on cantaloupes at USDA, ARS, SRRC.

Diane Barrett reported her work on analysis of texture and measurement of tissue integrity at UC Davis.

Jeff Brecht reported on quality and postharvest physiology research at Univ. Florida.

Xuetong Fan reported work on quality and microbiology work at USDA, ARS, ERRC.

Randy Beaudry reported work on 1-MCP absorption and gas permeability model at Michigan State Univ.

Aubrey Mendonca reported work on microbial detection and combination of irradiation and sanitizers at Iowa State Univ.

Jinhe Bai reported work on package and ethanol vapor at Oregon State Univ.

Peter Toivenen reported work on 1-MCP releasing, and ATP at Agric. Agric.-Food Canada.

Mikal Saltveit reported work on reduction of lettuce browning at UC Davis.

Marita Cantwell reported work on vitamin C and reduction of sunchoke browning at UC Davis.

Bill Hurst reported work on pathogen ecology and reduction at Univ. Georgia.

Jorge Fonseca reported work on pre-harvest factors and quality at Univ. Arizona.

Roberto Avena-Bustillos reported work on antibrowning coating at USDA, ARS, WRRRC.

Moon Kim reported work on imaging technology at USDA, ARS, BARC

Yaguang Luo reported worked on sanitizers and hot water at USDA, ARS, BARC.

1. Feedback and discussion from industry representatives present

Art Davis of Green Giant Fresh said he used to work with Bacon industry, and there were much more collaborations between industry and academics. Industry provided research funds. He thought that fresh produce industry was more loosely constructed. He encouraged scientist to meet with people and listen to the needs of industry people, and find a person who needs solutions.

Jeff Brecht suggested that United Fresh establishes an advisory committee for the S-294 group so that the need of industry could be heard by S-294 scientists. David Gombas said there were 4-5 S-294 members on the Technology Council who should report back to S-294 scientists.

Barry Eisenberg, co-chair of the UFPA Technology Council said the industry had written research priorities. One of the areas is food safety. He said many practices in the industry have no scientific justification and therefore need back-up from scientific data. The industry as a whole should figure out how to raise funds for research. He said that individual companies have funded research. For example, Fresh Express established a \$2.5 million research fund. If the industry works together, much more funding will be raised for research. Research should focus on technologies that can be commercially applied. The industry needs to establish a mechanism to raise money and ask other members to support. Each research institution has own expertise. We can learn from the alliance between McDonald and Disney which benefits each party.

Reuben thanked the presence of Industry representatives, and encouraged them to join the meeting next year. He also asked industry to support research.

Bill said that National Cattleman's Beef Association has a mechanism to raise money by taking \$1/ cattle for research. Xuetong said that the Washington State Apple Commission also raises research money (\$0.25 per box of apples).

Art Davis said Dole is tacking on food safety surcharges, charging \$0.20 more each carton beginning April 29, 2007. However, for UFPA, it is hard to collect even 2 cents. California Department of Agriculture charged \$0.02 /carton for inspection. He reminded the consequence of spinach outbreaks: 25% of loss in spinach consumption. UFPA needs a change so that research funds can be raised.

Anne Plotto asked about the difference between PMA and UFPA. David Gombas said that PMA is for marketing/retailers while UFPS is for processors. There are also many activities scheduled to lobby congress to support produce industry.

At 4:30: Aubrey took over from Peter Toivonen (who needs to catch a plane) to chair the session.

Ozgur Koc of Earthbound Farms said he has been working with Earthbound for 7 months. Before that, he worked with Crunch Pak. Crunch Pak funded a research project to Gerald Sapers about de-contamination of anti-browning solutions.

Jeff Brecht said someone needs to take a lead to put ideas together to apply for funds.

Aubrey adjourned the meeting at 5:00 pm.

Accomplishments:

Objective 1. Develop, evaluate, and standardize subjective and objective quality evaluation methods in intact and fresh-cut fruits and vegetables.

- The catechol and nitroso visual assays of Kader and Chordas (1984) were adapted using fresh-cut mango slices to visualize the distribution of PPO and phenolics, respectively, within the mesocarp. (Brecht)
- Digital images of several fresh-cut products were associated with previously developed rating systems for inclusion in the database developed by project participants at UC Davis. (Brecht)
- A rapid method for extraction and determination of lycopene content has been developed and verified. (Barrett)
- A book chapter for the Ingersoll Rand Encyclopedia on methods of measuring fruit and vegetable quality has been written and should be published in 2007. (Barrett)
- Methods for comparing analytical and sensory methods of analysis of tomatoes and oranges has been initiated. (Baldwin and Plotto)
- A comparative study for antioxidant contents and flavors in tropical fruits was completed. (Baldwin and Plotto)

- A trained panel developed and implemented for study of flavor and aroma profiling of 1-MCP treated versus non-treated tomatoes. (Baldwin and Plotto)
- Rank testing (an approach not requiring a trained panel) was utilized to compare mangoes, oranges and tangerines with different coatings and effects of enzyme peel pre-cut treatments of oranges.(Baldwin and Plotto)
- Off-the-shelf ATP swab kits are being evaluated for their utility in rapid assessment of maturity in apples. Initial results indicate a dramatic drop in measured ATP levels at the time of induction of ethylene climacteric in Granny Smith apples (Toivonen).

Objective 2. Develop new strategies to maintain fresh-cut product quality

- The influence of the ethylene action inhibitor, 1-methylcyclopropene (1-MCP), on shelf life and deterioration of fresh-cut cantaloupe during storage was determined. Intact 3/4 to full-slip cantaloupes were treated with 1-MCP, then fresh-cut cubes and intact fruit were stored for 12 d at 5C. The more physiologically advanced distal tissue developed significantly more watersoaking than the less advanced portions. Firmness retention was better in 1-MCP treated intact fruit, but the effect of 1-MCP on firmness retention and watersoaking of fresh-cut cubes was variable. 1-MCP did not significantly influence flesh color or soluble solid contents of either intact cantaloupe fruit or fresh-cut cubes. (Brecht & Huber)
- The effectiveness of 1-MCP applied continuously to fresh-cut tomato slices during storage for 10 d at 5C in a modified atmosphere package (MAP) was no better compared to slices from whole fruit treated with 1-MCP prior to slicing and storage, however, all 1-MCP treatments reduced gel loss and juice leakage compared to controls not stored in MAP. (Brecht & Huber)
- Ripe papaya fruit were treated with 1-MCP, immediately processed into fresh-cut slices or left intact, and stored for 10 d at 5C. Ethylene production by mesocarp tissue was not significantly affected. Firmness of slices and intact fruit mesocarp was significantly better retained by 1-MCP. Electrolyte leakage remained low and changed little in intact fruit while increasing in slices after 4 d; after 6 d control slices were higher than slices from 1-MCP-treated fruit. Microbial counts in stored slices were generally unaffected by 1-MCP. Informal sensory analysis indicated that the edible shelf life was 6 d in slices from 1-MCP-treated fruit compared with 2 to 3 d for slices from control fruit. (Huber)
- Low temperature blanching was found to inactivate pectin methyl esterase and thus firm tissues of 10 different vegetables. (Barrett)
- Heating the cut ends of leaves in cored iceberg lettuce reduces subsequent phenolic accumulation and tissue browning. (Saltveit)

- Development of a decision-support tool for MA packaging (Beaudry). MS-Excel program which allows user to select an appropriate MA-film for a particular fruit or vegetable product.
- Evaluated 1-MCP sorption by target plant materials and found that those containing cellulose absorbed significant quantities of 1-MCP, which might compromise efficacy (Beaudry).
- Antimicrobial phytochemicals with distinctive flavors can be incorporated in compatible fresh-cut fruits and vegetables achieving similar flavors as already accepted by consumers in salad dressings and fruit-based desserts (Avena-Bustillos).
- Hot water treatment of whole cantaloupe on reduction of microbial populations and quality of subsequent fresh-cut cubes was evaluated. (Beaulieu and ERRC).
- Risk of furan formation in fresh cut produce in response to irradiation treatment was evaluated. There is no risk of furan formation in irradiated fresh-cut products (Fan).
- Alternative technology relying on rachis removal, sanitization, hot water treatment and modified atmosphere packaging was found to maintain quality of clustered grape without need for sulfur dioxide to control decay (Luo).
- A hybrid orange-fleshed melon was evaluated and found to be excellent for whole storage and also excellent in terms of shelf life and nutritional quality retention once transformed into fresh-cut cubes (Saftner)
- A two stage approach (preharvest sanitizer spray, followed by postharvest chitosan coating) was found to significantly reduce decay in strawberries.(Narciso, Baldwin and Plotto)
- A combined treatment technology has been developed and a patent application submitted. This technology controls ripening and microbial growth in intact and fresh-cut fruits and vegetables (Toivonen)
- Humidity control combined with ethanol vapor improves quality retention of intact and fresh-cut cherries. (Bai)
- Brown rot (*Monilinia fructicola*) was significantly reduced by a pre-packaging dip with saprophytic yeast (*Cryptococcus infirmominiatum*) and ethanol pads at 1 and 20°C, respectively. (Bai)

Objective 3. Improve understanding of biochemical, physiological and molecular mechanisms that affect fresh-cut product quality.

- The optimum ripeness stage for preparation of fresh-cut mango was investigated using fruit harvested at the same maturity stage (minimum SSC = 15%). Ripening was initiated by 24 h ethylene exposure and fruit were selected for slicing after progressively longer periods of ripening. Fresh-cut mango shelf life at 5C was determined to be better correlated with flesh color than with peel color, TTA, SSC or flesh firmness. The 46C water treatment required for phytosanitary purposes was found to have no significant effect on fresh-cut mango quality or shelf life. The response of fresh-cut versus whole mango fruit to chilling temperature (5C) compared to non-chilling temperature (12C) storage was investigated. Aroma retention was reduced by chilling.
- Watermelon fruit were exposed to 1-MCP prior to storage as intact or fresh-cuts for 7 d at 10C. Respiration but not ethylene was significantly enhanced by cutting. Tissue from 1-MCP-treated fruit had higher 1-aminocyclopropane-1-carboxylate synthase (ACS) activity, suppressed respiration, and undetectable 1-aminocyclopropane-1-carboxylate oxidase (ACO) activity during storage. CaCl₂ dips had little influence on ACS activity, but significantly enhanced ACO activity and maintained firmness of fresh-cut tissue during storage. 1-MCP treatment of intact watermelon is alone unlikely to benefit the storage duration of fresh-cut watermelon. (Huber)
- Several tropical fruits including guava, mango, acai, and passionfruit, were shown to have a unique chemical makeup and that those chemical compounds provide health benefits related to their antioxidant and anti-cancer activities. Fractionation of these foods into related families of chemical compounds do not provide the same degree of health benefits as the whole food. Guava induces caspase-3 and caspase-8, two enzymes in the apoptotic pathway resulting in death of cancer cells. A dose related increase in caspase activity was shown. (Talcott)
- Identification of a wound signalling compound in extracts of wounded lettuce leaves that stimulates phenolic metabolism in healthy, undamaged tissues. (Saltveit).
- Randy Beaudry, Jeff Brecht and Elizabeth Baldwin have submitted a NRI proposal on enzyme and volatile of melons.
- Randy Beaudry has initiated a project to determine the impact of atmosphere and temperature on the gene expression of sliced and whole tomato.
- Jorge Fonesca evaluated the effect of UV-C, chlorine and hydrogen peroxide on key nutritional compounds of fresh-cut tomatoes.
- New statistical correlation method (Trosset plots) applied to analyse two years of volatile and maturity data for melons (Beaulieu).
- Solid phase extraction method developed for assessing volatile analysis of fresh-cut watermelon (Beaulieu).

- The ratio of acetate to non-acetate ester ratios was confirmed as a good approach to interpreting flavour balance in fresh-cut melons and apples (Beaulieu).
- Have identified two accessions from Kazak *Malus* spp. Which are immune to *Penicillium*. The quality and disease resistance of these accessions will continue to be studied.(Saftner)
- Resistance to cut-edge browning was found to be low when Granny Smith apples were harvested two weeks or before the initiation of climacteric ethylene production (Toivonen).

Objective 4. Standardize methods for recovering pathogenic and spoilage microorganisms from intact and fresh-cut produce including tree nuts.

- A method using flow-through immunocapture with real-time PCR was developed and demonstrated for detection of several human microbial pathogens in selected foods within 8 hours. (Schneider)
- A method involving flow cytometry and fluorescent molecular probes to rapidly detect *Salmonella* in bean sprouts is being developed (Mendonca).
- Confirmed that prior reports of reduction of volatile loss on exposure to UV light by cantaloupe cubes were not true. It is safe to use UV to treat cantaloupe since it has no inadvertent effect on flavor (Beaulieu).
- MS Thesis collaboration completed, Allison Dumas, LSU, November, 2006. “Antimicrobial Activity of CPC and ASC Against Foodborne Pathogens and the Physiological Effect on Fresh-cut Cantaloupe at Refrigerator Temperatures”. (Beaulieu)
- Developed a protocol to sample microbial populations on only the cut surfaces of fresh-cut product. This allows study of the effect of transfer of microbes from the peel to the cut surface during processing. (Narciso, Baldwin and Plotto).

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

- Survival and growth of *Bacillus atrophaeus* and *Salmonella* spp. and effectiveness of sanitizer treatments in inactivation of *Salmonella* on fruit or vegetable surfaces was shown. (Bartz & Schneider)
- Effect of last irrigation timing on the microbial populations on harvest lettuce was determined (Fonesca)

- Antimicrobial phytochemicals with high volatility have been incorporated as coatings on fresh-cut produce or films. These compounds diffuse into the vegetable tissues and package headspace to control pathogenic and spoilage microflora (Avena-Bustillos).
- Effects of food grade sanitizers in combination with irradiation are being investigated for synergistic control of microbial populations in fresh-cut fruit (Mendonca).
- Mixtures of organic acids and surfactants are being evaluated for their effectiveness in killing human enteric pathogens on fresh produce and tree nuts.(Mendonca)
- Acidified calcium sulfate and Sanova are effective at reducing microbial populations of whole cantaloupes without causing any detrimental effects on quality (Fan).
- Hot water pasteurization of whole cantaloupes resulted in lower total plate counts in fresh-cut product made from heat-treated fruit and there was no negative effect on quality. (Fan).
- Despite sanitation treatment, cantaloupe must be stored at low temperatures following treatment to suppress regrowth of any viable contaminant on the rind surface (Annous).
- A pilot scale enhanced Biosafety Level Two containment facility for evaluation of produce disinfestations technologies has been validated (Annous).
- Chlorine dioxide gas treatment was found to be effective at inactivating Salmonella attached to inaccessible site of cantaloupe rind or within biofilms. The treatment also reduced spoilage organism populations and did not have adverse effects on quality. (Annous).
- Physiological and environmental factor studies have shown the nutrient composition along cut edges and package atmosphere interact and can affect pathogen virulence. (Saftner)
- Ongoing recovery and isolation of non-pathogenic micro-organisms which are then assessed for potential antagonists activities against other microbes.
- Conducted a study on the comparative microbial loads on various fruits and vegetables (cantaloupe, mango, citrus, potatoes and small fruits). (Narciso, Baldwin and Plotto)
- Studies are showing that *E. coli* O157:H7 grows rapidly at 15 °C on fresh-cut Romaine lettuce and slowly at 8 °C. The growth at 15 °C is variable, depending on the lot of lettuce. (Delaquis and Bach)
- Starvation of *E. coli* O157:H7 and *Salmonella* can induce a viable but non-cultural state (VBNC). (Delaquis and Bach)

- Studies are ongoing regarding survival of *E. coli* in dairy manure, soil, after transfer to Romaine lettuce and in fresh-cut Romaine. (Delaquis and Bach)
- Review paper concluded that prevention of preharvest contamination is essential to minimize the risk of illness caused by consuming raw produce because Postharvest treatment of the produce with sanitizers cannot be relied upon to eliminate pathogens. (Beuchat)
- Hypochlorite form (calcium or sodium salt) does not affect the level of microbial control or flavor of fresh-cut lettuce or diced tomatoes. (Beuchat)
- Information on the effectiveness of various sanitizers on the killing of *Bacillus* spores on apple surfaces and stainless steel has been developed (Beuchat).
- Survival and growth of *Enterobacter sakazakii* on fruits and vegetables and factors affecting growth and survival were documented (Beuchat).

Impacts:

1. S-294 scientists working in food safety have provided the fresh and fresh-cut fruit and vegetable industries with critical information resolve ongoing food safety issues which challenge existence of the industry.
2. S-294 scientists are investigating the potential commercialization of a sanitizer and sanitization strategy for use on fresh-cut fruit and vegetables with a US-based company already marketing a processing aid to the fresh-cut industry.
3. Members of S-294 have developed a food security audit program specifically for fresh produce growers and processors and fresh-cut processors in the Southeast U.S.
4. Members of S-294 have been co-authors of a white paper entitled “Infections associated with cantaloupe consumption: A public health concern”.
5. S-294 scientists are negotiating the licensing of a new combined release technology for controlling ripening and decay in fresh and fresh-cut products with a US-based company already marketing a ripening control product to the industry.
6. Several S-294 members participated in the United FreshTech Food Safety Symposium in April 2007, providing leadership to the industry on food safety issues for fresh and fresh-cut produce.
7. Several S-294 members participated in the Science Symposium and the Food Irradiation Workshops hosted at the United FreshTech Conference in April 2007.

8. The S-294 meeting attracted five produce and fresh-cut produce industry representatives, providing a forum for discussion of research priorities and how to develop better interactions between researchers and industry.
9. The S-294 members presented 19 posters at the United FreshTech trade show. These posters generated interest from industry and led to follow-up interactions with researchers.
10. Members from the USDA and the University of Florida developed and manned booths at the trade show, facilitating interaction with members of the fresh and fresh-cut produce industries.

Publications:

Allende, A., J. McEvoy, Y. Luo and C.Y. Wang. 2006. Effectiveness of two-sided UV-C treatments in inhibiting natural microflora and extending the shelf-life of minimally processed 'Red Oak Leaf' lettuce. *J. Food Microbiology* 23(3): 241-249.

Allende, A., Gonzalez, R.J., McEvoy, J.L, and Luo, Y. 2007. Assessment of sodium hypochlorite and acidified sodium chlorite as antimicrobial agents to inhibit growth of *Escherichia coli* O157:H7 and natural microorganisms on shredded carrots. *Intl. J. Veg. Sci.* 2007. In press.

Annous, B.A., E.B. Solomon, and B.A. Nimiera. 2006. Biofilms on fresh produce and difficulties in decontamination. *Food Quality* 13(2):80-84.

Annous, B.A. 2007. Efficacy of hot water surface pasteurization vs. non-thermal sanitizing wash treatments for reducing populations of *Salmonella* Poona on inoculated whole cantaloupe melons. *J Food Prot.* (submitted).

Anthon, G.E. and D.M.Barrett. 2006. Potential and limitations for determining lycopene in tomatoes by optical methods. *Acta Hort* 724, 243-248

Bai, J., J.P. Mattheis and N. Reed. 2006. Re-initiating softening ability of 1-methylcyclopropene-treated 'Bartlett' and 'd'Anjou' pears after regular air or controlled atmosphere storage. *J. Hort. Sci. Biotechnol.* 81: 959-964.

Bai, J., E.A.Mielke, P.M. Chen, R.A. Spotts, M. Serdani, J.D. Hansen and L.G. Neven. 2006. Effect of high-pressure hot-water washing treatment on fruit quality, insects, and disease in apples and pears. Part I. System description and the effect on fruit quality of 'd'Anjou' pears. *Postharvest Biol. Technol.* 40: 207-215

Bartz, J.A., M.J. Mahovic, and J. Tenney. 2006. Chlorine dioxide gas controls postharvest pathogens of tomato by mass transfer from a source to the fruit. *Phytopathology* 96:S9. (Abstract)

- Beaudry, R.M., Luckanatinvong, V. and Solomos, T. 2006. Maintaining quality with CA and MAP. In: A.C. Purvis, W.B. McGlassen and S. Kanlayanarat (eds.), Proc. Intl Conference on Managing Quality in Chains (MQUIC). Acta Horticulturae 712:245-252.
- Beaulieu J.C. and V. Lancaster. 2007. Correlating volatile compounds, quality parameters, and sensory attributes in stored fresh-cut cantaloupe. J. Agric. Food Chem. (Submitted)
- Beaulieu J.C. 2007. The effect of UV irradiation on cut cantaloupe: Terpenoids and esters. J. Food Sci. (In Press; 72(4):S1-S10?)
- Beaulieu J.C. and J.M. Lea. 2007. Quality changes in cantaloupe during growth, maturation, and in stored minimally processed cubes prepared from fruit harvested at various maturities. J. Am. Soc. Hort. Sci. (In Press)
- Beaulieu J.C. and J.M. Lea. 2006. Characterization and semi quantitative analysis of volatiles in seedless watermelon varieties using solid-phase microextraction. J. Agric. Food Chem. 54(20):7789-7793.
- Beaulieu J.C. 2006. Volatile changes in cantaloupe during growth, maturation, and in stored fresh-cuts prepared from fruit harvested at various maturities. J. Amer. Soc. Hort. Sci. 131(1):127-139.
- Beaulieu J.C. 2006. Effect of cutting and storage on acetate and non-acetate esters in convenient, ready to eat fresh-cut melons and apples. HortSci. 41(1):65-73.
- Beuchat, L. R. 2006. Vectors and conditions for preharvest contamination of fruits and vegetables with pathogens capable of causing enteric diseases. Brit. Food J. 108:38-53.
- Beuchat, L. R., A. C. Kreske, J.-H. Ryu, and C. A. Pettigrew. 2006. Efficacy of chlorine dioxide and other sanitizers in killing *Bacillus cereus* spores in biofilms. Abstr., Annu. Mtg., Inst. Food Technol., 25- 28 June, Orlando, FL. p. 235.
- Bowen, A., A. Fry, G. M. Richards, and L. R. Beuchat. 2006. Infections associated with cantaloupe consumption: A public health concern. Epidemiol. Infect. 134:675-685.
- Boynton, B.B., B.A. Welt, C.A. Sims, M.O. Balaban, J.K. Brecht, and M.R. Marshall. 2006. Effects of low-dose electron beam irradiation on respiration, microbiology, texture, color, and sensory characteristics of fresh-cut cantaloupe stored in modified atmosphere packages. J. Food Sci. 71:S149-S155.
- Canoles, M.A., Li, C., Howe, G. and Beaudry, R.M. 2006. Deficiency of linolenic acid in Lefad 7 mutant tomato changes the volatile profile and sensory perception of disrupted leaf and fruit tissue. J. Amer. Soc. Hort. Sci. 131:284-289.

Conway, William, Wojciech Janisiewicz, Britta Leverentz, Robert Saftner and Mary Camp. 2007. Control of blue mold of apple by combining controlled atmosphere, antagonist mixtures and sodium bicarbonate. *Postharvest Biology Technol.* In press.

Dallaire, R., Vasseur, L., LeBlanc, D.I., Tranchant, C. C. and Delaquis, P. 2006. A methodological approach for assessing the microbial contamination of fresh produce from harvest to retail. *Food Protection Trends.* 26:218-225.

Dallaire, R. LeBlanc, D.I., Tranchant, C.C., Vasseur, L., Delaquis, P., and Beaulieu, C. 2006. Monitoring the microbial populations and temperatures of fresh broccoli from harvest to retail display. *Journal of Food Protection.* 69:1158-1125.

DeEll, J.R., P.M.A. Toivonen, F. Cornut, C. Roger, and C. Vigneault. 2006. Addition of sorbitol with KMnO₄ improves broccoli quality retention in modified atmosphere packages. *Journal of Food Quality* 29: 65-75.

Delaquis, P.J., A. Wen, P.M.A. Toivonen, and K. Stanich. 2006. Evidence of an antilisterial factor induced by wounding of iceberg lettuce tissues. *Letters in Applied Microbiology* 42: 289-295.

Ergun M., D.J. Huber, J. Jeong, and J.A. Bartz. 2006. Extended shelf life and quality of fresh-cut papaya derived from ripe fruit treated with the ethylene antagonist 1-methylcyclopropene. *J. Amer. Soc. Hort. Sci.* 131:97-103.

Fan, L., Song, J., Beaudry, R. and Hildebrand, P.D. 2006. Effect of hexanal vapor on spore viability of *Penicillium expansum*, lesion development on whole apples and fruit volatile biosynthesis. *J. Food Sci.* 17(3):105-109

Fan, X. Annous, B.A., Sokorai, K.J., Burke, A., Mattheis, J.P. 2006. Combination of hot water surface pasteurization of whole fruit and low dose irradiation of fresh-cut cantaloupe. *J. Food Protect.* 69:912-919.

Fan X., B.A. Annous, J.C. Beaulieu, K.J.B. Sokorai, A. Burke and J. Sites. 2007. Effect of hot water surface pasteurization of whole fruit on shelf-life and quality of fresh-cut cantaloupe. *J. Food Sci.* (Submitted)

Fan, X., Fett, W. F., Mitchell B. M. 2007. Effects of Negative Air Ions on *E. coli* ATCC 25922 Inoculated on Mung Bean Seed and Apple Fruit. *J. Food Protect* 70:204-208

Fan, X., Niemira, B.A., Rajkowski, K.T., Sokorai, K.J.B. 2006. Radiation sensitivity and quality of fresh-cut vegetables exposed to gamma radiation. Pp. 293-300 in *FAO/IAEA TecDoc "Irradiation to Ensure Hygienic Quality of Fresh, Pre-cut Fruits and Vegetables and Other Minimally Processed Food of Plant Origin."* IAEA, Vienna, Austria

Fan, X., Sokorai, K.S.B. 2007. Effect of ionizing radiation on quality of frozen corns and peas. *J. Food Protection* (accepted).

Fatemi, P., L.F. LaBorde, J. Patton, G.M. Sapers, B. Annous, and S.J. Knabel. 2006. Influence of punctures, cuts, and surface morphologies of golden delicious apples on penetration and growth of *Escherichia coli* O157:H7. *J. Food Prot.* 69(2):267-275.

Felkey, K., D.L. Archer, J.A. Bartz, R.M. Goodrich, and K.R. Schneider. 2006. Chlorine disinfection of tomato surface wounds contaminated with *Salmonella* spp. *HortTechnology* 16:253-256.

Ferenczi, A., Song, J., Tian, M., Vlachonasios, K., Dilley, D., and Beaudry, R.M. 2006. Volatile ester suppression and recovery following 1-methylcyclopropene application to apple fruit. *J. Amer. Soc. Hort. Sci.* 131(5):691-701.

Fonseca, J.M. and J.W. Rushing. 2006. Effect of ultraviolet-C light on quality of fresh-cut watermelon. *Postharvest Biology and Technology* 40: 256-261.

Fonseca, J.M. 2006. Postharvest quality and microbial population of head lettuce as affected by moisture at harvest. *Journal of Food Science* 71: M45-49.

Gapper, N.E., J. Bai, and B.D. Whitaker. 2006. Inhibition of ethylene-induced α -farnesene synthase gene *PcAFSI* expression in d'Anjou pears with 1-MCP reduces α -farnesene synthesis and oxidation and delays development of superficial scald. *Postharvest Biol. Technol.* 41: 225-233.

Goodner, K. and J. Bai. 2006. The use of stir-bar sorptive extraction (SBSE) for analytical food analysis. *Proc. Fla. State Hort. Soc.* 119: In press.

Guevara, J.C., Yahia, E.M., Beaudry, R.M. and Cedeno, L. 2006. Modeling the influence of temperature and relative humidity on respiration rate of prickly pear cactus cladodes. *Postharvest Biol. Technol.* 41:260-265.

Hampson, C.R., R.A. MacDonald, D.-L. McKenzie, W.D. Lane, H.A. Quamme and P.M.A. Toivonen. 2006. 'SPA343' (Sabina™) Apple. *HortScience* 41(6): 1510-1512.

Hansen, J.D., M.L.Heidt, L.G.Neven, E.A. Mielke, J. Bai, P.M. Chen, and R.A. Spotts. 2006. Effect of high-pressure hot-water washing treatment on fruit quality, insects, and disease in apples and pears. Part III: Use of silicone-based materials and mechanical methods to eliminate surface pests. *Postharvest Biol. Technol.* 40: 221-229.

Jin, J., N. Shan, N. Ma, J. Bai, and J. Gao. 2006. Regulation of ascorbate peroxidase at the transcript level is involved in tolerance to postharvest water deficit stress in the cut rose (*Rosa Hybrid* L.) cv. Samantha. *Postharvest Biol. Technol.* 40: 236-243.

Kappel, F., P. Toivonen, S. Stan, D.-L. McKenzie. 2006. Resistance of Sweet Cherry Cultivars to Fruit Surface Pitting. *Canadian Journal of Plant Science* 86: 1197–1202.

Kenney, S. J., G. L. Anderson, P. L. Williams, P. D. Millner, and L. R. Beuchat. 2006. Migration of *Caenorhabditis elegans* to manure and manure compost, and potential of the bacterivorous nematode to transport *Salmonella* Newport to fruits and vegetables. *Int. J. Food Microbiol.* 106:61-68.

Khanizadeh, S., Y. Groleau, A. Levasseur, R. Tsao, R. Yang, J. DeEll, C.R. Hampson and P. Toivonen. 2006. 'SJCA38R6A74' (Eden). *HortScience* 41(6): 1513-1515.

Kim, H., L. R. Beuchat. 2006. Behavior and control of *Enterobacter sakazakii* in fresh fruits and vegetables. Georgia Association for Food Protection, Winter Meeting, 9 February, Griffin, GA. p. 9.

Kim, H., and L. R. Beuchat. 2006. Survival and growth of *Enterobacter sakazakii* on produce and inactivation by sanitizers. Abstr., Annu. Mtg. Center for Food Safety, University of Georgia, 28 February - 1 March, Atlanta, GA. p. 8-9.

Kim, H., and L. R. Beuchat. 2006. Survival and growth of *Enterobacter sakazakii* on fresh produce as affected by temperature and effectiveness of sanitizers for its elimination. Abstr., Annu. Mtg. Inst. Food Technol., 25-28 June, Orlando FL. p. 147.

Kim, H. J., Hao, F., Mosbah, K., and Fan, X. 2006. Effects of ultrasound, irradiation, and acidic electrolyzed water on germination of alfalfa and broccoli seeds and on *E. coli*. 157:H7. *J. Food Sci.* 71 (6), M168–M173.

Kreske, A. C., J.-H. Ryu, and L. R. Beuchat. 2006. Evaluation of chlorine, chlorine dioxide, and a peroxyacetic acid-based sanitizer for their effectiveness in killing *Bacillus cereus* and *Bacillus thuringiensis* spores in suspensions, on stainless steel, and on apples. *J. Food Prot.* 69:1892-1903.

Kreske, A. C., J.-H. Ryu, and L. R. Beuchat. 2006. Evaluation of sanitizers for effectiveness in killing *Bacillus cereus* and *Bacillus thuringiensis* on stainless steel and apples. Abstr., Annu. Mtg., Inst. Food Technol., 25-28 June, Orlando, FL. p. 147.

Kreske, A. C., J.-H., Ryu, C. A. Pettigrew, and L. R. Beuchat. 2006. Lethality of chlorine, chlorine dioxide, and a commercial produce sanitizer to *Bacillus cereus* and *Pseudomonas* in liquid detergent, on stainless steel, and in biofilm. Abstr., Annu. Mtg. Int. Assoc. Food Prot., 13-16 August, Calgary, ALB, Canada. p. 107.

Kreske, A. C., J.-H. Ryu, C. A. Pettigrew, and L. R. Beuchat. 2006. Lethality of chlorine, chlorine dioxide, and a commercial produce sanitizer to vegetative cells and spores of *Bacillus cereus* and cells of *Pseudomonas* in a dishwashing detergent and on the surface of stainless steel. *J. Food Prot.* 69: 2621-2634.

Kim, H., J.-H. Ryu, and L. R. Beuchat. 2006. Survival of *Enterobacter sakazakii* on fresh produce as affected by temperature, and effectiveness of sanitizers for its elimination. *Int. J. Food Microbiol.* 111:134-143.

Lee, Y.S., Beaudry, R., Kim, J.N. and Harte, B.R. 2006. Development of a 1-methylcyclopropene (1-MCP) sachet release system. *J. Food Sci.* 71(1):1-6.

Lester, Gene, Robert Saftner and Mark Hodges. 2007. Market quality attributes of orange-fleshed non-netted honey dew genotypes as influenced by growing season, storage duration, and temperature. HortTechnology. In press.

Lu, S., Luo, Y., and Feng, H. 2006. Browning inhibition of apple slices using sodium chlorite. *J. Agric. Food Chem.* 54: 3693-3696.

Lu, S., Luo, Y., Feng, H., and Turner, E. 2007. Efficacy of Sodium Chlorite as an Inhibitor of Enzymatic Browning in Apple Slices. *J. Food Chem.* In press.

Mahattanatawee, K., K.L. Goodner and E.A. Baldwin. 2005. Volatile constituents and character impact compounds of Florida's tropical fruit. *Proc. Fla. State Hort. Soc.* 118: 414-418.

Mahattanatawee, K., J.A. Manthey, G. Luizio, S.T. Talcott, K. Goodner and E.A. Baldwin. 2006. Total antioxidant activity and fiber content of select Florida-grown tropical fruits. *J. Agric. Food Chem.* 54: 7355-7363.

Mahovic, M.J., K.R. Schneider, K. Cordasco, and J.K. Brecht. 2007. Salmonella recovery from tomato fruit surfaces as affected by ethylene. *HortTechnology* 17:52-55.

Mahovic, M.J., R. Shukla, R. Goodrich-Schneider, M.V. Wood, J.K. Brecht, and K.R. Schneider. 2007. *Bacillus atrophaeus* spore survival on netted cantaloupe melon surfaces after moist heat treatment. *HortTechnology* (in press).

Mao L., J. Jeong, F. Que, and D.J. Huber. 2006. Physiological properties of fresh-cut watermelon (*Citrullus lanatus*) in response to 1-methylcyclopropene and post-processing calcium application. *J. Sci. Food Agric.* 86:46-53.

Mendonca, A., O. Byeelashov, L. goodridge and J.Lopes. 2006. Combined effectiveness of lactic acid and sodium lauryl sulphate in destroying *Salmonella* Enteritidis, *Escherichia coli* O157:H7 and *Listeria monocytogenes* on whole raw almonds. Abstract P5-35, in Abstracts of the Annual Meeting of the International Association for Food Protection, Calgary, Alberta, Canada, Aug. 13-16, 2006.

Mendonca, A.F. and A. Orozalieva. 2006. Combined effectiveness of hydrogen peroxide and a food-grade surfactant for destroying *Salmonella* spp and *Escherichia coli* O157:H7 on whole cantaloupe. Abstract 016-06, in Abstracts of the Annual Conference S-294 and of the International Association for Food Protection, Baltimore, MD, April 26-29, 2006.

Mendonca, A.F., R. Morrow and L. Tuominen. 2006. Control of Human Enteric Pathogens for Safe Crop Production on the Deployable Vegetable Production System (VEGGIE). Abstract

HLS 144 in Abstracts of Habitation 2006 – Conference on Habitation Research and Technology, Orlando, FL, February 5-8, 2006.

Moon, K.-D., P. Delaquis, P. Toivonen, and K. Stanich. 2006. Effect of vanillin on the fate of *Listeria monocytogenes* and *Escherichia coli* O157:H7 in a model apple juice medium and in apple juice. *Food Microbiology* 23: 169-174.

Moon, K.D., P. Delaquis, P. Toivonen, S. Bach, K. Stanich and L. Harris. 2006. Destruction of *Escherichia coli* O157:H7 by vanillic acid in unpasteurized juice from six apple cultivars. *Journal of Food Protection* 69: 542-547.

Murray, M. B., J. B. Gurtler, J.-H. Ryu, M. A. Harrison, and L. R. Beuchat. 2006. Evaluation of direct plating methods to enumerate *Alicyclobacillus* in beverages. Abstr., Food Micro 2006, 20th ICFMH Symp., 29 August - 2 September, Bologna, Italy. p. 530.

Narciso, J.A., E.A. Baldwin and A. Plotto. 2007. Preharvest peroxyacetic acid sprays slow decay and extend shelf life of strawberries. *HortScience* (in press).

Neven, L.G., J.D. Hansen, R.A. Spotts, M. Serdani, E.A. Mielke, J. Bai, and P.M. Chen. 2006. Effect of high-pressure hot-water washing treatment on fruit quality, insects, and disease in apples and pears. Part IV: Use of silicone-based materials and mechanical methods to eliminate surface arthropod eggs. *Postharvest Biol. Technol.* 40: 230-235.

Ngarmsak, M, Delaquis P, Toivonen, P, Ngarmsak, T, Ooraikul, B and Mazza, G. 2006. Microbiology of fresh-cut mangoes prepared from fruit sanitized in hot chlorinated water. *Food Science and Technology International* 12(2):95-103.

Ngarmsak, M., Delaquis, P., Toivonen, P., Ngarmsak, T., Ooraikul, B. and Mazza, G. 2006. Antimicrobial activity of vanillin toward spoilage microorganisms in stored fresh-cut mangoes. *Journal of Food Protection* 69:1724-1727.

Niemira, B.A.; Fan, X. 2006. Low dose irradiation of fresh-cut produce: safety, sensory and shelf life. In: Sommers, C.H. Fan. X. (eds.): *Food Irradiation Research and Technology*. Blackwell Publishing/IFT Press, pp169-184.

Niemira, B.A., Fan, X., Sokorai, K.J.B., Sommers, C.H., Rajkowski, K.T. 2006. Studies of post-irradiation survival of *Listeria monocytogenes* and *L. innocua* on endive, regrowth under modified atmosphere packaging and product sensory qualities. pp. 301-316 in FAO/IAEA TecDoc "Irradiation to Ensure Hygienic Quality of Fresh, Pre-cut Fruits and Vegetables and Other Minimally Processed Food of Plant Origin." IAEA, Vienna, Austria.

Ortega, Y.R. 2007. Efficacy of sanitizers and disinfectants in killing pathogenic parasites. Abstr., CFS Annu. Mtg., Atlanta, GA 27-28 Feb. 2007.

Ortega, Y.R., V.A. Cama, A. Robertson, A. Mann, L. Cabrera, C. Taquiri, L. Xiao, R.H. Gilman.

- Detection of *Cyclospora* in vegetables and potential contamination sources in endemic areas. Abstr., CFS Annu. Mtg., Atlanta, GA 27-28 Feb. 2007
- Ortega, Ynes R., and Jyeyin Liao. 2006. Microwave inactivation of *Cyclospora cayetanensis* sporulation and viability of *Cryptosporidium parvum* oocysts. *J. Food Prot.* 69(8): 1957-1960.
- Ortega, Ynes R., Maria P. Torres, Siara VanExel, Lauren Moss, and Vitaliano Cama. 2007. Efficacy of a sanitizer and disinfectants to inactivate *Encephalitozoon intestinalis* spores. *J. Food Prot.* 70(3): 681-684.
- Park, S., Sugimoto, N., Larson, M.D., Beaudry, R. and van Nocker, S. 2006. Identification of genes with potential roles in apple fruit development and biochemistry through large-scale statistical analysis of ESTs. *Plant Physiol.* 140:811-824.
- Percival, S.S., S.T. Talcott, S.T. Chin, A.C. Mallak, A. Lounds-Singleton, and J. Pettit-Moore. 2006 Inhibition of neoplastic transformation and cancer cell cycle arrest by mango (*Mangifera indica* L.). *J. Nutr.* 136:1-5, 2006.
- Pinnavaia, S., E.A. Baldwin, A. Plotto, J.A. Narciso and E. Senesi. 2006. Enzyme peeling of Valencia oranges for fresh-cut slices. *Proc. Fla. State Hort. Soc.* (in press).
- Pinnavaia, S., A. Plotto, J.A. Narciso, E.A. Baldwin and E. Senesi. 2007. Citric acid extends shelf-life of fresh-cut oranges with modifying eating quality. *J. Food Qual.* (submitted).
- Plotto, A., J. Bai, J.A. Narciso, J.K. Brecht, and E.A. Baldwin. 2006. Ethanol vapor prior to processing extends fresh-cut mango shelf-life by decreasing spoilage, but does not always delay ripening. *Postharv. Biol. Technol.* 39:134-145.
- Plotto, A., J.A. Narciso, E.A. Baldwin and N. Rattanapanone. 2006. Edible coatings and other surface treatments to maintain color of lychee fruit in storage. *Proc. Fla. State Hort. Soc.* (in press).
- Plotto, A. and C.K. Chandler. 2006. Taste panels evaluate quality of five University of Florida strawberry selections. *Proc. Fla. State Hort. Soc.* 119: 308-311.
- Rajkowski, K.T., Fan, X. 2007. Microbial quality of fresh-cut iceberg lettuce washed in warm and cold water and irradiated in a modified atmosphere package *J. Food Safety* (accepted).
- Rojas-Graü M.A., Avena-Bustillos R.J., Friedman M. Henika P.R., Martín-Belloso O., and McHugh T.H. 2006. Mechanical, Barrier and Antimicrobial Properties of Apple Puree Edible Films Containing Plant Essential Oils. *J. Agric.Food Chem.*54, 9262-9267.
- Rojas-Graü M.A., Avena-Bustillos R.J., Olsen C.W., Friedman M. Henika P.R., Martín-Belloso O., Zhongli Pan, and McHugh T.H. 2007. Effects of Plant Essential Oils and Oil Compounds on Mechanical, Barrier and Antimicrobial Properties of Alginate-Apple Puree Edible Films. *J. Food Eng.* Vol. 81(3), 634-641.

Rojas-Graü M.A., Raybaudi-Massilia R.M., Avena-Bustillos R.J., Martín-Belloso O., Pan Z., and McHugh T.H. 2007. Apple puree-alginate edible coating as carrier of antimicrobial agents to prolong shelf life of fresh-cut apples. *Postharvest Biol. Technol.* (2007), doi:10.1016/j.postharvbio.2007.01.017

Saftner, R., Luo, Y., McEvoy, J., and Abbott, J. 2007. Analytical quality characteristics of fresh-cut watermelon slices from non-treated and 1-methylcyclopropene- and/or ethylene-treated whole fruit. *Postharv. Biol. Technol.* In press.

Saftner, Robert, Judith Abbott, Gene Lester and Bryan Vinyard. 2006. Sensory and analytical comparison of orange-fleshed honeydew to cantaloupe and green-fleshed honeydew for fresh-cut chunks. *Postharvest Biology Technol.* 42:150-160.

Sapundjieva, T., L. Beuchat, and M. Chinnan. 2006. The behavior of *Alicyclobacillus acidoterrestris* N- 1108 spores in beverages under different surroundings. Third Central European Congress on Food, 22-24 May, Sofia, Bulgaria. p. 219.

Sathyanarayanan, L., and Y.R. Ortega. 2006. Effects of temperature and different food matrices on *Cyclospora cayetanensis* oocyst sporulation. *J Parasitol.*, 92(2): 218-222.

Simmons, J. L., J.-H. Ryu, and L. R. Beuchat. 2006. Comparison of treatment of fresh-cut lettuce and diced tomatoes with sodium hypochlorite for effects on microbiological and sensory qualities. *Food Prot. Trends.* 26:662-667.

Simmons, J. L., J.-H. Ryu, and L. R. Beuchat. 2006. Comparison of treatment of fresh-cut produce with sodium hypochlorite and calcium hypochlorite for effects on microbiological and sensory quality. *Abstr., Annu. Mtg. Int. Assoc. Food Prot.*, 13-16 August, Calgary, ALB, Canada. p. 161.

Simmons, Karen, Mark A. Harrison, William C. Hurst, Judy Harrison, Jeffrey Brecht, Keith Schneider, Amy Simonne, and James Rushing. 2007. *Survey of Food Defense Practices in Produce Operations in the Southeast.* *Food Protection Trends* 27(3): 174-184 (March 2007).

Sites, J.E., Walker, P.N., Burke, A., and Annous, B.A. 2007. Development and validation of a pilot scale enhanced biosafety level two containment for performance evaluation of produce disinfection technologies. *J. Applied Biosafety* (Submitted)

Solomon, E.B., L. Huang, J.E. Sites, and B.A. Annous. 2006. Thermal Inactivation of Salmonella on Cantaloupes Using Hot Water. *J. Food Sci.* 71(2):M25-M30.

Spotts, R.A., M. Serdani, E.A. Mielke, J. Bai, P.M. Chen, J.D. Hansen, L.G. Neven and P.G. Sanderson. 2006. Effect of high-pressure hot-water washing treatment on fruit quality, insects, and disease in apples and pears. Part II. Effect on postharvest decay of d'Anjou pear fruit. *Postharvest Biol. Technol.* 40: 216-220.

- Tan, H., X. Liu, N. Ma, J. Xue, W. Lu, J. Bai, and J. Gao. 2006. Ethylene-influenced flower opening and expression of genes encoding Etrs, Ctrs, and Ein3s in two cut rose cultivars. *Postharvest Biol. Technol.* 40(2): 97-105.
- Thongsook, T., J.R. Whitaker, G.M. Smith and D.M. Barrett. 2007. Reactivation of broccoli peroxidases: Structural changes of partially denatured isozymes. *J. Ag. Food Chem.* (in press)
- Toivonen, P.M.A. 2006. Fresh-cut apples: Challenges and opportunities for multi-disciplinary research. *Canadian Journal of Plant Science* 86: 1361-1368.
- Toivonen, P.M.A. and P. Delaquis. 2006. Low volume sprays to treat fresh-sliced apples with anti-browning solution. *HortTechnology* 16: 257-261.
- Toivonen, P.M.A., F. Kappel, S. Stan, D.-L. McKenzie and R. Hocking. 2006. Factors affecting the quality of a novel fresh-cut sweet cherry product. *Food Science and Technology/LWT* 39:240-246.
- Tomassen, M.M.M., D.M.Barrett, H.C.P.M. van der Valk and E.J. Woltering. 2007. Isolation and characterization of a tomato non-specific lipid transfer protein involved in polygalacturonase-mediated pectin degradation. *J. Exp. Bot.* (in press)
- Torres, M.P., and Y.R. Ortega. 2006. Resistance of *Cyclospora* and *Cryptosporidium* to sanitizers. Abstr., CFS Annu. Mtg., Atlanta, A, 28 Feb-1 Mar, 2006.
- Ukuku, D., Fan, X., Komzpel, M. 2006. Effect of vacuum-steam-vacuum treatment on microbial quality and fresh-cut cantaloupe pieces. *J. Food Protect.* 69:1623-192.
- Vallejo, F., Beaudry, R.M. 2006. Depletion of 1-MCP by 'non-target' materials from fruit storage facilities. *Postharvest Biol. Tech.* 40:177-182.
- Vilaplana, R., and M.C. Valentines, P. Toivonen and C. Larrigaudière. 2006. Antioxidant potential and peroxidative state of 'Golden Smoothie' apples treated with 1-methylcyclopropene. *Journal of the American Society for Horticultural Science* 131: 104-109.
- Wang, H. Feng, H., and Luo, Y. 2006. Control of browning and microbial growth on fresh-cut apple by sequential treatment of sanitizers. *J. Food. Sci.* 72: M1-M7.
- Wang, H., Feng, H., and Luo, Y. 2006. Dual-phasic inactivation of *Escherichia coli* O157:H7 with peroxyacetic acid, acidic electrolyzed water, and chlorine on cantaloupes and fresh-cut apples. *J. Food Safety.* 26: 335-347.
- Warren, B.R., H.-G. Yuk, and K.R. Schneider. 2007. Detection of *Salmonella* by flow-through immunocapture real-time PCR in selected foods within 8 hours. *J. Food Prot.* 70:1002-1006.
- Warren, B.R., H.-G. Yuk, and K.R. Schneider. 2007. Survival of *Shigella sonnei* on smooth tomato surfaces, in potato salad and in raw ground beef. *International J Food Microbiol.* 116:400-404.

Warren, B.R., H.-G. Yuk, and K.R. Schneider. 2006. Detection of *Shigella sonnei* in selected foods by flow-through immunocapture followed by real-time polymerase chain reaction or isolation on MacConkey agar. *J. Rapid Methods Automation Microbiol.* 14:309-324.

Wilfred, J., A. Mendonca and L. Goodridge. 2006. Water pressure effectively reduces *Salmonella* Enteritidis, on the surface of raw almonds. Abstract T7-03, in Abstracts of the Annual Meeting of the International Association for Food Protection, Calgary, Alberta, Canada, Aug. 13-16, 2006.

Yuk, H.-G., J.A. Bartz, and K.R. Schneider. 2006. The effectiveness of sanitizer treatments in inactivation of *Salmonella* spp. from bell pepper, cucumber, and strawberry. *J. Food Sci.* 71:M95-M99.

Yuk, H.-G., B.R. Warren, and K.R. Schneider. 2006. Preliminary evaluation of flow-through immunocapture followed by real-time PCR for the detection of *Salmonella* serovars on tomato surfaces within 8 hours. *J. Food Prot.* 69:2253-2257.

Zhou, Bin, James McEvoy, Yaguang Luo, Robert Saftner, Hao Feng and Tony Beltran. 2006. 1-Methylcyclopropene counteracts ethylene-induced microbial growth on fresh-cut watermelon. *J. Food Sci.* 71:M180-M184.