

Minutes of S-294 Business Meeting
Bronze 2 Room, Bally's Hotel
Las Vegas, NV
Sunday, May 4, 2008

Project: S-294 Postharvest Quality and Safety in Fresh-cut Vegetables and Fruits

Offices (2007-2008)

Chair: Aubrey Mendonca

Vice Chair: Xuetong Fan

Secretary: Anne Plotto

List of Attendees

<u>Name</u>	<u>Institution</u>	<u>email</u>
Alan M. Lefcourt	USDA, ARS, Beltsville	alan.lefcourt@ars.usda.gov
Anne Plotto	USDA, ARS, CSPL	anne.plotto@ars.usda.gov
Aubrey Mendonca	Iowa State University	amendon@iastate.edu
Barry Eisenberg	River Ranch/UFPA	beisenberg@rrff.com
Bassam Annous	USDA,ARS, ERRC	Bassam.annous@ars.usda.gov
Bill Hurst	University of Georgia	bhurst@uga.edu
Bill Romig	MAPCS, LLC	romigwr@comcast.net
Charles Forney	AAFC	forneys@agr.gc.ca
David Gombas	United Fresh Produce Assoc	dgombas@unitedfresh.org
Floyd Woods	Auburn University	woods@auburn.edu
Jeff Brecht	University of Florida	jkbrecht@ufl.edu
Jennifer DeEll	OMAFRA, Ontario Ministry of Ag.	Jennifer.Deell@ontario.ca
Jim Gorny	UC-Davis	jrgorny@ucdavis.edu
John Beaulieu	USDA, ARS, SRRC	john.beaulieu@ars.usda.gov
Mikal Saltveit	UC Davis	mesaltveit@ucdavis.edu
Pat Millner	USDA, ARS, BARC	Pat.Millner@ars.usda.gov
Randy Beaudry	Michigan State University	beaudry@msu.edu
Reuben Moore	Mississippi State University	reubenm@mafes.msstate.edu
Thomas Orton	Rutgers University	Orton@aesop.rutgers.edu
Xuetong Fan	USDA, ARS, ERRC	xuetong.fan@ars.usda.gov

The meeting convened at 9:45 a.m.

Review of agenda – accepted as submitted

In an **introductory** statement, the Chair thanked United Fresh for their support to the S-294 working group and helping organizing the meeting.

In a **welcome** statement, Dave Gombas, United Fresh, emphasized how important research is to the industry, how industry turns to research for answers. He wishes to continue a long-term relationship with the research group. He then discussed the state of the industry, with mixed news. On the “good news” side, the industry has been working actively with Capitol Hill on the new Farm Bill to convince Congress to support specialty crops – may be as much as \$230,000,000 for specialty crop research. Most of research emphasis is on food safety, but some support for diversity, sustainability, shelf-life and food quality research. On the negative side, the industry members feel they do not get all the support for the research: they need solution-based research. Even though S-294 helped organize the Science symposium, the industry does not feel they are getting an answer to their questions. One issue is in the area of food safety to set standards for produce handling: when they wanted to set food safety standards, they did not have the science base to set the standards. They need assessment of risks to understand microbial cycles. To overcome these difficulties, a research work group is starting this year. A prioritized list has been made: intervention strategies #1 priority – information on priorities found on website. John Beaulieu (LA) will assist in developing/coordinating research priorities on the Food Safety and Technology Council for UFPA. Additional notes of welcome and a description of eligibility of S-294 members for registration at UFPA were provided. Next year, the meeting will be held at the Venetian April 22-24.

Some discussion followed with respect to the relationship between S-294 and industry: Jim Gorny: the comments about academia teaming up with industry is appropriate, however, the exchange needs to go both ways. It is important for scientists to understand confidentiality, and how to establish a trusting relationship between industry and research.

Examples of positive relationship between industry and academia were given by Barry Eisenberg (River Ranch Fresh Foods) and Pat Millner (USDA,ARS).

2007 minutes approval: Tabled until end of meeting to allow all to read the minutes.

Reuben Moore, the Administrative Advisor, complimented the group for its productivity (publications and scholarly activity). Impact is usually greater when there are publications. The Farm Bill is good news for the group. Researchers will have to apply for grants through NSF, NRI or others to get some of these research dollars. He admitted that competitive grants do not have the same priorities than industry solution-based research, but he hopes the researchers follow through to the industry for results. About Create 21, a few of the components are still in the bill. However, the merger with CREES will not happen. Hatch funds will likely all go competitive, which will negatively impact multistate research projects in the future. He offered assistance if

needed. Gorny asked about multistate research funds for travel to this project - 7 or 8 of the attendees indicated they receive travel funds. He noted that UCD did not allocate funds for travel and asked the group how funds were handled. Moore indicated that AES Director has discretion regarding travel and other support. Moore indicated he could find out how much Hatch \$\$ were sent to each land grant university and offered to send a letter to the Director of the Experiment Station.

Election of new secretary. Bassam Annous nominated Mikal Saltveit. Carried unanimously.

Planning 2009 meeting:

Mendonca requested input for UFPA Science Symposium topics. He described current process for identifying topics. Beaulieu suggested that request for speakers go out at least 6 months prior to date of meeting (Sept/Oct). This does not exclude the possibility that an outbreak or crisis occurs, which will need to be addressed. Annous asked about inviting international speakers (example of FAO/WHO project looking at chlorine issues). Lefcourt suggested that technological issues may be more appropriate from in-country speakers. Gombas suggested no limits be placed on Symposium as long as it involves the best of the best research that we as top researchers think the UFPA needs. Gorny asked if UFPA had travel funds for speakers. Gombas indicated it was negotiable. Mendonca indicated that executive committee will take up the process earlier, 6 months prior to the meeting as suggested. Motion was made to this effect and carried.

Brecht suggested the executive committee commit to updating membership list. Moore asked that those not on the list (he provided this) leave their name on the document. The membership list was passed around.

Research Division - UFPA

Beaulieu described his activities with the research division of UFPA and initiated a discussion of the relationship between UFPA and S-294. He indicated that UFPA directors group was large and unwieldy, so working groups were developed. There are now 5 working groups, one of which is the research division. The other four working groups are: education and outreach, microbiology, audits, and standards harmonization. The Center for Produce Safety at UCD will become a clearinghouse for research information; he indicated his interest in assisting that effort. He suggested the contacts with UFPA be utilized for various research-related agendas. He asked that S-294 provide some input as to his role with UFPA. Lefcourt mentioned the difficulty with getting growers (primarily growers) and people using equipment and other technologies used in the fresh produce industry. Gombas indicated that there really is a good deal of representation across the industry and that within the UFPA, there are 4 sectors: a grower shipper board, fresh-cut processors board, retail food service board, and whole food board. Each board will have their own issues/agenda. Gombas offered his resources to enable appropriate interactions and Beaulieu will work with all 4 groups. Eisenberg provided some descriptions of the realities of the disconnection between researchers and industry, especially with regard to timelines that we both work on. Lefcourt commented on the lack of industry financial support. Brecht reminded that S-294 was created to

identify projects and pool our brains/resources to take it to the industry. He thinks the Research Division is a great improvement. He suggested UFPA act as a lobbying group to change funding structure at the governmental level. Gorny suggested the UFPA may provide letters of support for various projects. Moore indicated that government support likely will not directly address UFPA priorities. Gombas agreed, but described success in terms of investment on dollars spent via lobbying. Discussion ensued of the nuances of industry/scientist research relationships. Gombas noted that even political discussions are long-term. Lefcourt indicated there may be a risk regarding the Farm Bill not returning if impacts are not evident.

News from UC-Davis:

Gorny described the development of the Center for Produce Safety (Fernandez Exec. Dir.) at UCD including funding (\$4.5M) from industry (\$4.0M) and California Department of Food and Agriculture (\$0.5M). They will have their first advisory board meeting on June 19th, and the Research Committee on May 23rd.

Station Reports:

Anous (USDA-ERRC) – NRI grant with UCD to develop effective treatments on leafy greens: They succeeded a 5-log reduction with chlorine dioxide, but noted visual quality effects. He also described surface pasteurization of cantaloupe using hot water (76.1°C for 3 min) and chlorine dioxide. They will take it to a pilot scale. Results are promising in terms of flora remaining. Also mentioned the development of recommendations published for a level 2 biosafety facility.

Fan (USDA-ERRC) – Described use of 1 kGy radiation treatment to reduce *E. coli* on 13 commodities commonly used in fresh cut. No negative effects were apparent, but some improvement in decay reduction was noted. A reduction in vitamin C content in response to radiation was noted. Another project looked at reducing *Salmonella* on whole cantaloupe using chemical sanitizers.

Hurst (UGA) – Described funding of \$2M in awards to UGA from Fresh Express (from a total of \$9M) for control of *E. coli*. He noted five different food safety studies on *E. coli* O157:H7 underway. He described four projects underway by M. Harrison. The published activities regarding *E. coli* and *Salmonella* were described including *E. coli* transmission in ice and a non-pathogenic strain with similar attachment properties to pathogenic strain.

Orton (Rutgers) – Has only had recent interest in fresh-cut research. Described activities and industries involved in postharvest area, noting that interest is waxing. He noted that a facility for business incubation (26,000 sq. ft.) for food proc. being built.

Beaudry (MSU) – Looked into packaging of sliced melon and pear. There was no impact of MAP on color or texture of ‘Rocha’ pear (collaboration with Portugal), but it made a difference on melon. Other projects: Evaluation of gene expression of chilled and heat-treated tomato fruit. Look at the genes associated with the generation of aroma esters by using transformed yeast and *Arabidopsis*.

DeEll (OMAFRA) – Reported on reduced browning apples and their potential for fresh-cut apples, including ‘Eden’. Discussed slow-release 1-MCP in packages, which benefited sliced apple storage. She described a study evaluating ‘Empire’ storage and internal browning: when 1-MCP was used, decay increased in short-term storage; however, 1-MCP benefitted in long-term storage

Saltveit (UC-Davis) – Described simple (field) test for titratable acids using a filter paper similar to a litmus test for pH. Described method to measure CO₂ efflux immediately after cutting.

Mendonca (Iowa State) – Used electron beam irradiation to sanitize cantaloupe surface: it was more effective when used after a wash, and fruit surface still wet. Wetting with citric acid + surfactant improved log reduction due to washing and a subsequent radiation treatment. He also described efforts for detection of human pathogens. One method uses flow cytometry and fluorescent tagging.

Plotto (USDA/ARS) – Described research with sensory panels on 1-MCP treated tomato, strawberries and citrus juice. She mentioned work going on to substitute a lab test for sensory panels. Peroxyacetic acid use in field enhanced long-term storage of strawberry. She described research on a new clamshell package (Bai).

Beaulieu (USDA/ARS) – Has plans to begin work on amino acid metabolism as it pertains to aroma synthesis. He is establishing a new method of aroma measurements, using SBSE instead of SPME (more volatiles can be extracted from the sample – less variation due to the absorbent). He will start work on molecular techniques in collaboration with UCD, as they relate to aroma formation of melon and cucumber. Has intent to work on inhibition of ripening in MAP. Will begin work on E. coli contamination on spinach.

Forney (Agrifood-Canada) –Evaluating/discriminating aroma impact of processing steps, packaging, and biological changes on onion, pepper, squash, and colored carrots. Challenges keep a low microbial load on butternut squash: incorporation of antimicrobial compounds such as microgard and potassium sorbate in edible coatings worked. Another project looking at volatiles involved fresh cut onions in packages made of PLA and found aroma was retained as long as the packages were non-perforated. He reported on studies underway looking at microbial ecology as it relates to food safety with projects including liquid dairy manure and potential bioterrorism agents. He reported on Toivonen’s research: apple slices packaged in microporous films had fruitier aroma when compared with slices in conventional solid films MAP. Research underway to slow-release ethanol using yeast and sugar, + MCP in packaging, might benefit many commodities.

Lefcourt (USDA/ARS-BARC) – Described efforts evaluating human pathogens and food-borne illness. They develop genetically-labeled E. Coli to see if and how it is incorporated in the produce. They are primarily using hyperspectral imaging with a goal to developing multispectral hand-held devices. Looking at developing probes for

detecting purposely contaminated foods for the military. Some efforts to try to scanning apples for contamination in real-time; reported that the capacity to do quality and contamination assessment is at commercial readiness. Looking at the use of Raman spectroscopy as a laboratory tool to detect virulent organisms.

Brecht (UFla) – Described assay for browning to visualize PPO and phenolic distribution. Reported on expansion of digital image library for fresh cuts. Found that immature fruit tended to be more sensitive to hot water treatment-induced browning. Huber showed that 1-MCP reduced water-soaking associated with senescence and apoptosis-like events in senescing tissues. Found that hot-water treatments had a relatively minor impact on aroma and quality in mango – more impact when the fruit is immature. He presented Bartz' data on use of RT PCR detection technique. Noted that high-temperature treatments did not stimulate spore germination of Bacillus (instead of Anthrax) and that ethylene did not enhance Salmonella proliferation.

Woods (Auburn) – In cantaloupe, he found that hot water + irradiation delayed ripening as well as good microbial control. He found that low dose irradiation directly applied to cut cantaloupe had an adverse effect on carotenoids. A significant reduction in contamination by Salmonella was found. Is now evaluating the impact of peeling on sweet potato quality. Attempts will be made to improve mandarin orange segment storage and appearance.

End presentations

Discussion:

Brecht asked about industry acceptance of irradiation treatments. Fan described recent workshop on concerns and challenges remaining for implementation. Gombas mentioned that consumer resistance may still be significant and that cost is a significant issue. Mendonca described advantages of irradiation on leafy greens in packages, especially with regard to E. coli and its susceptibility to radiation under moist conditions. FDA approval still somewhat of an obstacle. It was noted that incoming product quality had to be high. Right now, it is cost-prohibitive because of the logistics of the treatment.

New Business:

There was a motion to keep the S-294 meeting before the UFPA meeting. S-294 meeting to be scheduled on April 21st, 2009, at 9:00 a.m.

2009 meeting is again here in Vegas.

Next year's CA Conference and Postharvest Conference are in Turkey in the first two weeks of April.

A Gordon conference on Plant Senescence will be held in June 2008.

Saltveit noted that the final version of the Handbook 66 is at the editors.

Brecht noted that the attendance at the S-294 is declining, and lack of funds is an issue. He suggested that a regularly scheduled conference call be developed to enhance interaction, attendance, and planning and offered to organize it. Beaulieu suggested he

will take the request for support of the call by UFPA. This was moved (Beaulieu, Beaudry) and motion carried. Milner suggested UFPA contact land grant university deans to lobby for their making unit involvement a priority. Gorny suggested that National Program Leader on the topic area be included on the call. He provided an update on progress on strategic planning for vegetable industry.

Saltveit (Beaulieu) moved acceptance of the minutes as they are. Motion carried.

Motion to adjourn (Saltveit, Beaudry) carried (4:30 pm).