



**QUICK TESTS, WATER QUALITY, AND RINSES FOR FOOD SAFETY:
CONSIDERING INNOVATIVE SOLUTIONS WHILE DEFINING AGRICULTURE'S NEEDS**

**THINK TANK SESSION
MARCH 23, 2012**

SESSION NOTES

On March 23, 2012, Project 17, in collaboration with the Grower-Shipper Association of Central California and Hartnell College, convened an invitation-only think tank session to delineate the needs in the food safety arena for improved solutions in the areas of quick tests (on crops and fresh produce) and washes and rinses (in the processing stage). Twenty-two participants from the agricultural and university sectors joined the Project 17 team to focus on these two topics. Ten representatives of regional agricultural companies critiqued current solutions and outlined needs for improved technologies. The group heard presentations from two vendors (Hygiena with Micro-Snap quick test; and HyClo with an electrolyzed water rinse solution). The session was not focused on policy or legislation; rather it focused on what kinds of solutions could be put in place to satisfy the growers, customers and government agencies about the safety of produce from this region.

After a group exercise outlining the top three critiques of current quick tests, the group discussed the pros and cons – as well as a “Wish List” for both quick tests and rinses. The following notes are drawn from group discussions and written exercises during this half-day session.

Participating companies and organizations included:

- California State University, Monterey Bay
- Christensen & Giannini, LLC
- Coastline Produce
- Comgro Soil Amendments, Inc.
- Grower-Shipper Association
- HyClo, Inc.
- Hygiena - Americas
- Jefferson & Sons
- Metz Fresh, LLC
- Monterey County Farm Bureau
- Ocean Mist Farms
- Rose Royal Radicchio
- Solsustech Incorporated
- Steinbeck Central Produce
- Taylor Farms
- True Leaf Farms and Church Brothers
- United Fresh Produce Association
- University of California at Davis, Center for Produce Safety
- Hartnell College
- Project 17
- Smart World Center

GOALS OF THE SESSION

- Delineate agriculture's "Wish List"
 - For quick tests in crops
 - For rinses and washes for fresh produce
- Let innovative technologies inspire us

TOP THREE CRITIQUES OF CURRENT QUICK TEST SOLUTIONS

Generated Ideas from Written Exercise

Reliability

- Are they accurate / reliable?
- Reliability not really known
- Not tested in a transparent useful manner
- Need to be more reliable
- The validation process rarely takes into account field stress on target microbes, because the validation is done in a lab.
- Requirement for temperature control
- Exposure to sunlight
- Confidence in results IR to positive too long
- Sensitivity

Expense

- Too expensive
- Cost/sample
- Cost of tests

Too Difficult to Use

- Tools too complex to operate
- Time it takes for cultural confirmation
- Hard to collect data

Limited Acceptance

- Limited acceptance from government and customers
- I have to use a state certification lab for compost
- Public perception is mostly negative
- Lack of confidence in molecular method

Other Critiques

- Universality
- Specificity

PROS & CONS OF QUICK TESTING IN AGRICULTURE

- Obstacle: holding product too long makes it lose quality
- Obstacle: holding up land waiting for replanting (while waiting for results)
- For every customer asking for test, there are just as many not requiring it
- Cool technologies often not out there for agriculture yet
- Ready-to-eat packages → buyer demand for testing
- Testing for verification versus validation
- Con: Not enough cold storage space to hold all the product while waiting for test results
- What good does it do to test product at the field?
 - Test sample of 20 heads out of 20,000
 - Absolute poorest method that the produce is safe
- We need a method that is
 - Acceptable
 - Cost effective
 - Works for our company and customers
- If you are processing product, there is a value
- USDA/FDA/State
 - Pulling a head of lettuce from a warehouse tests positive (it forces a recall no matter what)
 - They need rapid tests in their labs

- If you could test prior to shipment that would help
- 24 hours versus need of 12-hour turnaround
- Call for immediate results
- Requirement: test 7 days prior to a harvest
- Often don't need to use a quick test...but for things held in quarantine, yes.
- Many customers are not requiring pathogen testing, but other customers do.
- Indicator organism testing vs. pathogen testing
- ATP testing to validate sanitary conditions – yes, depends on costs.
- Happening
 - On farms
 - At shippers

NOTES FROM THE PRESENTATION BY HYGIENA REGARDING “MICRO-SNAP” AN INNOVATION IN QUICK TESTS FOR FOOD SAFETY

- Certification: Yes, Micro-Snap is AOAC: Is it AOAC R.I.?
- Does it look high or low risk on human error? We might need a third party lab to validate.
- How many companies have their own internal labs or incubators to do this kind of testing?
- Have you done real tests with real samples? Yes.

Questions for Hygiena

- How does this compare with delta track, for example
 - Indicator (yes) or Pathogen (no) test?
- Bet this doesn't work on compost...or...
- Are any of the growers or shippers doing tests on their compost? Or do they rely on the supplier?
- Any regulatory agencies looking to use this? Not yet.

WISH LIST FOR QUICK TESTS

- A quick test for pathogens would be very helpful
 - in the field; it's nice to have, but not necessary
 - useful in processing plant
- Ideal: flash a “black light” over a field after it's been washed over with something in the field. Would show up problems and avoid destroying the whole field.
- What about 4D visioning (per Google)? Aerial footage of a field...
- Yes there are spectra, however may be too fine to see at the level agriculture needs
- For produce: “Risk Analysis” a good indicator test that would show a strong likelihood of a possible pathogen – satisfying customers without having to do a pathogen test
- Hard to identify a good group of indicator organisms. We could test the water source – an indicator test.
- Hard to get a rapid test and have it be inexpensive.
- Index organism – environmental conditions (likely or unlikely that there would be a pathogen)
- Why not develop out a quicker pathogen test to begin with?
- What percentage of growers' budget is for food safety? 2-3%
- Must have a:
 - Scientific benefit
 - Cost benefit – hard to pass on food safety costs to the buyer
 - Market benefit which should drive the cost benefit
- Customers are driving this – AOAC or peer review

THE PROS AND CONS OF USING RINSES FOR FOOD SAFETY

Definitions of Wash and Rinse

- Wash: agitation and turbulence with more surface contact to reduce surface dirt or other residue – sanitation, not kill step
- Rinse: spray on top, possible final step after wash system with fresh water to remove residues; depending on the produce, a rinse may be the only step – no wash; could be a kill step
- When using water, we want to make sure that cross contamination is not an issue.
- Pro: a chlorine-based wash for our specific business is ok / “fine”.

- 2-log reduction
- Con: sanitization: oxidizing-base material – kills within 10 minutes
- Problem with chlorine-based washes: it dissolves metal!
- Issue: full optimization of their own system.

“HyClo:” Innovation in Electrolyzed Water Rinses: Potential for Ag (using hypochlorous acid)

- If you have calcium build up on processors, does this HyClo solution work? Yes.
- Starts to become ineffective above 85 degrees. Great at lower temperatures
- What about salty water from Salinas? – Should be fine.
- Is there data on South Africa regarding leafy greens? Yes.
- Innovation transfer
 - Needs proven testing: UC? USDA?
 - Other proof of concept testing
- Have to maintain produce quality – during testing evaluation process
- Con: significant cost to switch to a new system
- Pro: this solution is sodium free
- Volume of water needed?
- Sodium hydroxide is a byproduct
 - Is this a problem (e.g. meth users? No, too weak)
 - Pro: use for curing olives
- Can be turned back into tap water within hours/days
- Distance of generator from point of use: not sure, but examples include ¼ mile. Problem if pipe is too hot
- Log 5 – 8 reduction in water (lab data)

REFINING OUR WISH LIST FOR RINSES AND WASHES

- SmartWash – effective against biofilm
 - Elimination of cross-contamination in wash water
 - Avoids depletion of chlorine in wash solution
- Water-ready to use after wash

- Use chlorine-wash “waste” water for something useful (i.e., container plants)
- Wash rinse as a kill step. Chlorine-based wash NOT a kill step
- Sanitizing equipment – make it less corrosive (at ranch level)
- Worker safety issue regarding these chemicals

SUMMARY AND SHAPING THE NEXT SESSION ON FOOD SAFETY: APRIL 27, 2012

- Traceability
 - In food safety
 - Systems of Traceability
 - Customer level
 - Grower level
 - Field level, tracing the problem
 - Evaluating efficiencies
- Source tracking – trying to understand the root cause/source of contamination
- Food Safety
- Water quality issue
- Impact on product quality