



# Reducing Toxics in the Food & Beverage Sector

TURI Continuing Education Conference  
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# TUR Opportunities

- Cleaning and Sanitizing
- Surfaces and clean-in-place
- Investigate soils, surfaces, processes, and chemicals
  - Look for opportunities to eliminate or reduce hazard
  - Don't forget about water and wastewater treatment



# Field Work: Cleaning and Sanitizing in Microbreweries



# Cleaning and Sanitizing – Past and Present

		Product & Ingredients	Characteristics
Baseline	Detergent	PBW: 30% Sodium <u>Metasilicate</u>	pH 11-12
	Sanitizer	<u>Saniclean</u> : 29% phosphoric acid and 10% sulfonated oleic acid	pH 1
Phase I: Cleaning and Sanitization using ECA – large capacity	Detergent	<u>Catholyte</u> : weak sodium hydroxide	400 ppm <u>NaOH</u> pH >11.4
	Sanitizer	<u>Anolyte</u> : <u>hypochlorous acid</u> and sodium hypochlorite	190 ppm free available Chlorine pH 6.8
Phase II: Cleaning and Sanitization using ECA – janitorial capacity	Detergent	Potassium carbonate mixture at <0.3%	pH 10-11
	Sanitizer	Acetic acid <2.5%	pH 2.75
Phase III: Sanitization with <u>NaDCC tablets</u>	Detergent	PBW: 30% Sodium <u>Metasilicate</u>	pH 11-12
	Sanitizer	<u>NaDCC tablets</u> generating <u>hypochlorous acid</u>	100-200 ppm free available chlorine

# Testing Process – Multi Stage



# Results – Using NaDCC Tablets (BruTabs)

(sodium dichloroisocyanurate)



Sample Taken	Date/Time	Results		
		ATP*	Chlorine Meter**	Lab***
After cleaning and rinsing	5/17/17, 11:30 AM	2	No alarm	None detected
After sanitizing	5/17/17, 11:40 AM	0	Alarm	None detected
After flush rinse	5/17/17, 11:52 AM	0	No alarm	None detected

\*ATP reading of <10 is acceptable, <5 is preferred, and 0 is ideal

\*\* Chlorine meter threshold is set to alarm at concentrations at or above 0.5 ppm

\*\*\*A bacterial count result of 'none detected' is desirable



**Adam Pearson**  
Owner, Merrimack Ales in Lowell, Mass.

# Field Work: Chemical Use Reduction in Testing Lab



## Frying Oil Testing – Old vs New

Titration Chemicals	
<i>Chemical</i>	<i>Annual Amount Used</i>
Phenolphthalein	576 liters
Sodium hydroxide	48 liters
<b>Total</b>	<b>624 liters</b>

FoodLab Startup Costs	
<i>Item</i>	<i>Cost</i>
FoodLab Tester	\$4,041
New reagents	\$800
Taxes & freight	\$200
<b>Total</b>	<b>\$5,041</b>

Annual Operating Costs		
<i>Item</i>	<i>Titration Method</i>	<i>FoodLab System</i>
Replenishing agents		\$13,200
Chemical purchase, handling, disposal	\$14,736	
<b>Annual Savings</b>		<b>\$1,536</b>

## Results Due to Equipment Change Out

By changing methodologies from titration to photometric methods for free fatty acids, the quality control lab at Cape Cod Potato Chips realized the following reductions:

- Amount of hazardous chemicals purchased, stored, and used in the lab
- Time employees are exposed to these chemicals
- Testing time overall
- Cost associated with disposing of hazardous waste



# TURI FY19 Grants

## Are you a food or beverage processor interested in going green?

Apply for a TURI Grant to kick-start your company's transition to going green. You could protect the health and safety of workers while saving money.

*We can help you review chemical use at your facility and explore opportunities to reduce or eliminate toxics use through process or material changes.*

## Which Grant is Right for You?

Apply for a **TURI Small Business Grant of up to \$10,000** if you:

- Have fewer than 10 employees
- Do NOT report toxic chemical use under the Toxics Use Reduction Act

Apply for a **TURI Industry Grant of up to \$30,000** if:

- You use TURA reportable chemicals.





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# What we have learned

Opportunities exist to:

1) Reduce the use of:

- Toxics
- Energy
- Water

2) Reduce waste generation (organic, solid)

3) Improve value of sustainable practices to businesses



