



Cedar's Mediterranean Foods, Inc. Journey to Safer Cleaning and Sanitizing Methods in a Food Processing Plant

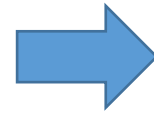
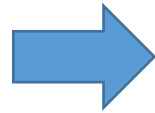
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HSE Manager



Cedar's Work with OTA and TURI



- OTA was invited to Cedar's Fall 2018
 - Kettle Cuisine case study – “Soup Manufacturer Refines Its Cleaning Processes” on TURI website under Publications
 - Cedar's also uses sodium hydroxide to clean our tank systems



Cedar's Work with OTA and TURI

- Cedar's HSE Manager took a Lean Mfg. class for food and beverage manufacturers in 2021
- Cedar's hosted a Pollution Prevention Intern, Summer 2022
- Intern worked on documenting food waste at Cedar's
- No likely projects for summer materialized, but wait.....

Cedar's Work with OTA and TURI

- Amelia Wagner, Intern had TURI Lab experience – WHAT!?
- Began working with TURI Lab on evaluating safer cleaning and sanitizing alternatives Summer 2022...work is ongoing



Hommus Tanks CIP Baseline

Current Products

5229 AFCO LF

Sodium hydroxide (50%), Potassium hydroxide

5339 Super Power Foam

Sodium hydroxide, Sodium hypochlorite, Potassium hydroxide

4325 PerOx

Peroxyacetic acid, Sulfuric acid

4312 Vigil Quat

Quaternary ammonium compounds

Chemical Health Implications

Sodium Hydroxide:

- Severe burns to eyes, skin, lungs, and digestive system. Development of dermatitis or blindness.

Sodium Hypochlorite:

- Development of pulmonary edema with potential for permanent damage. Dizziness, headaches, nausea, vomiting.

Potassium Hydroxide:

- Development of pulmonary edema with potential for permanent damage. Dizziness, headaches, nausea, vomiting.

Sulfuric Acid:

- Development of pulmonary edema. Burns to skin, and eyes potentially leading to blindness. Immediate lacrimation, rhinorrhea, and chest tightness.

Peroxyacetic Acid:

- At very low concentrations; burns to skin and eyes. Lung irritant causing shortness of breath and chest tightness.

Quaternary Ammonium Compounds:

- Dermal, eye and respiratory irritation; outcomes consistent with occupational asthma. Evidence of reproductive and developmental impacts

TURI Lab Testing – Tank Interior Cleaning

Purpose:

To find effective alternative cleaners for 5229 AFCC LF 1.1% @ 170 F, and to find effective alternative sanitizers for 4325 PerOx 0.05%.

Substrate:

304 stainless steel, 316 stainless steel.

Soil:

Cedar's chocolate hummus, heat treated to 160 F for 5 mins.

Method:

Ultrasonic agitation for 20 mins (cleaning step), followed by ultrasonic agitation for 5 mins (sanitizing step).

Analysis:

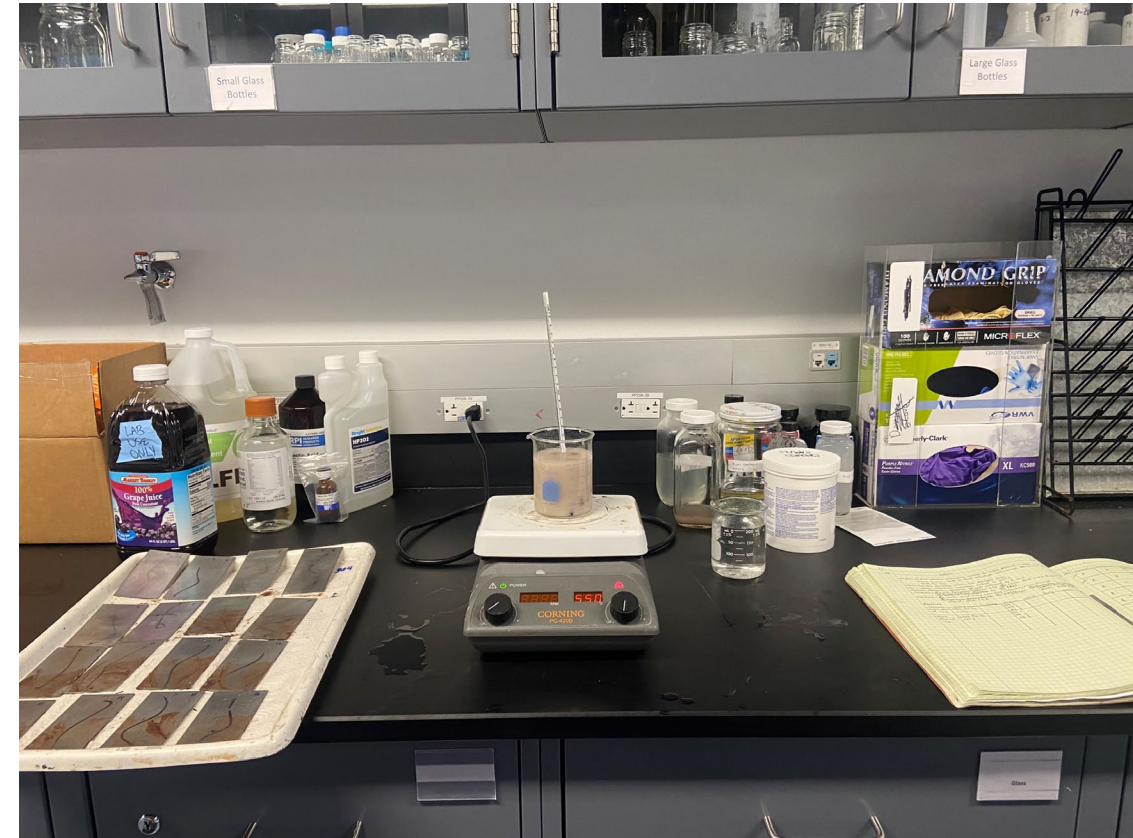
Gravimetric, visual, and ATP values

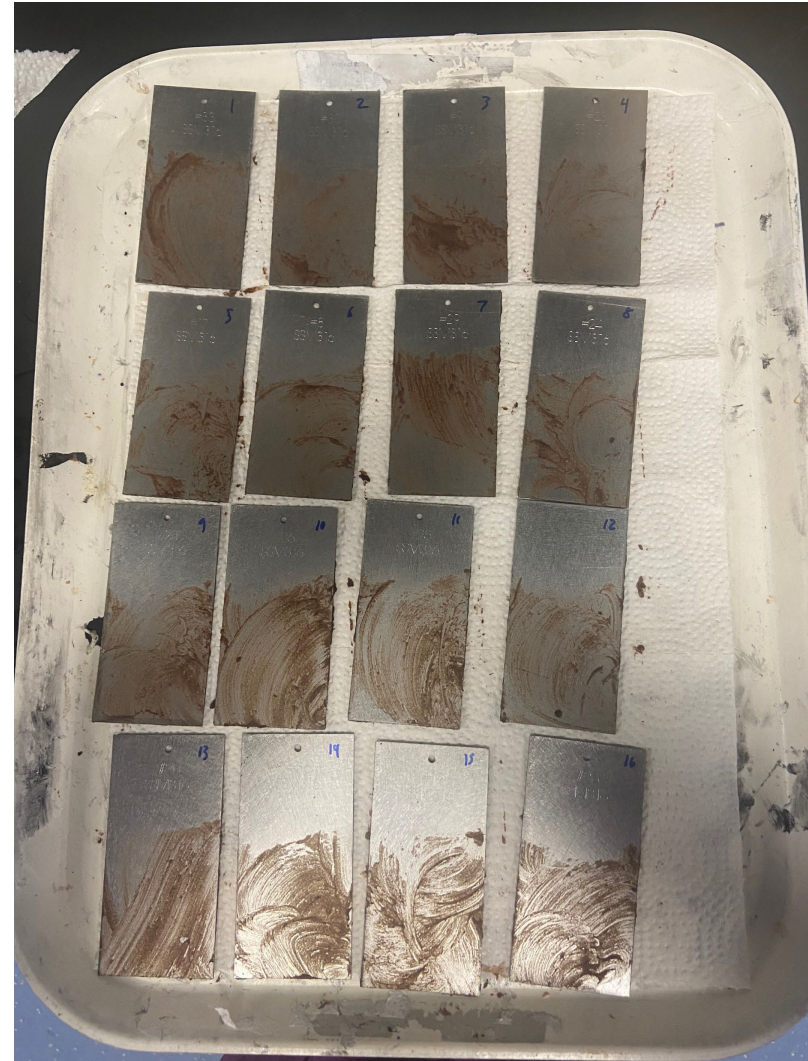
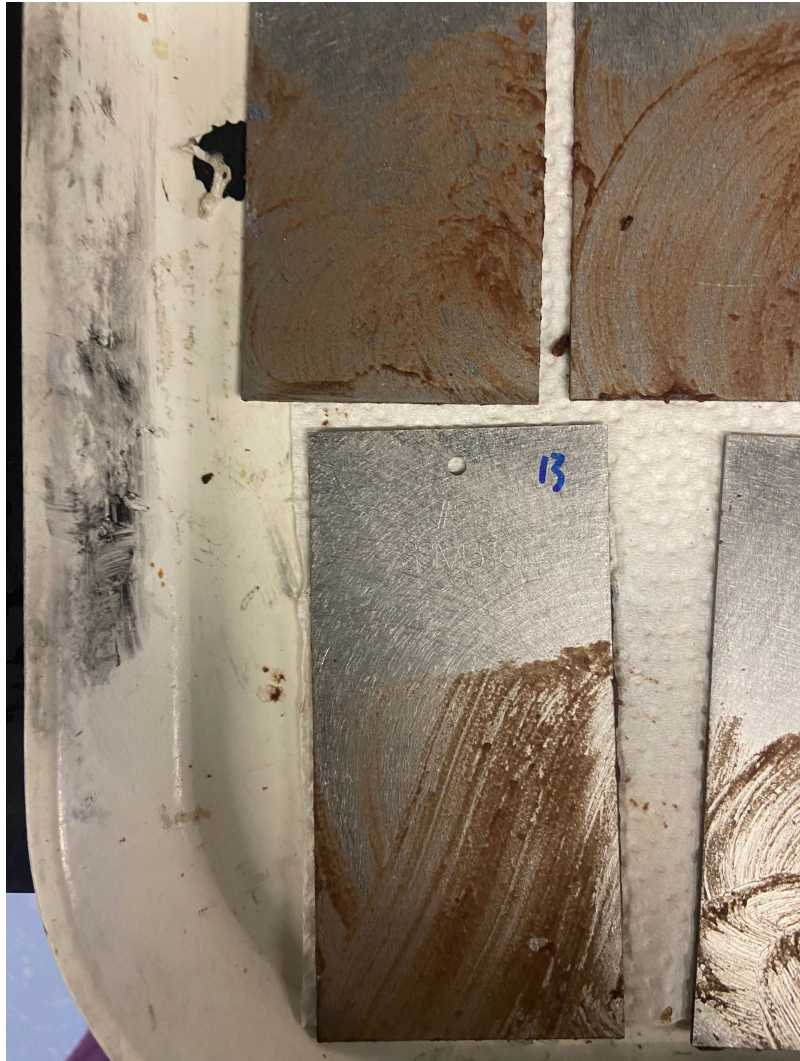
Alternative Cleaners:

- A. LFE Enzymatic Cleaner 2.5% @ 130 F
- B. Lactic acid 0.15% @ 140 F
- C. Bright Solutions Hp202 2% @ 140 F
- D. PBW 0.8% @ 120 F

Alternative Sanitizers:

- A. Lactic Acid 0.15% (cleaning and sanitizing in one step when tested with Lactic acid as a cleaner.
- B. Caprylic acid 0.15%
- C. NaDCC Tablets 269 ppm
- D. Acetic acid 0.15%





CEDAR'S 

Recommendations Based on Initial Testing

- Replace 5229 AFCO LF (sodium hydroxide, potassium hydroxide) with an Enzymatic Cleaner
- Replace 5229 AFCO with PBW
- Replace 4325 perox with a lactic acid sanitizer
- Continue testing – altering concentrations, temperatures, times
- Find out what enzymatic, lactic acid solutions may be available from current chemical vendor

Where Things Stand Today

- TURI Lab representatives had a call with current chemical vendor to find out what alternative cleaners/sanitizers they may offer
- TURI Lab developed safety scores for current and potential future chemicals using the P2OASys analysis

	Current Product	Potential Replacement		Current Product	Potential Replacement				
Hazard Category	4312 Vigil Quat	4325 PerOx	4390 Perafoam	5229 AFCO LF	5217 Hyperclean Flash	5415 Dispersol PS	4407 Micro Kleen LNP	4415 Micro-Zyme L	5253 Liquid Pan Handler
Acute Human Effects	10	10	9	10	9	10	10	8	10
Chronic Human Effects	7	6	5	4	4	5	5	8	4
Ecological Hazards	8	7	5	6	4	3	8	7	7
Environmental Fate & Transport	6	4	4	4	4	8	5	5	6
Atmospheric Hazard	5	2	5	5	5	5	5	5	5
Physical Properties	5	10	3	10	6	9	10	5	10
Process Factors	7	6	4	6	5	6	6	6	6
Life Cycle Factors	8	7	6	7	6	7	7	6	7
Weighted Average	7	6.5	5.1	6.5	5.4	6.6	7	6.3	6.9

Where Things Stand Today

- No clear winners emerged – some had comparable safety scores but greater dermal toxicity or other undesirable properties
- Cedar's is deciding whether to test one or two of the chemicals from its present vendor or to give TURI the greenlight to test chemicals from other vendors
- If some solid alternatives emerge, next phase would be pilot testing