Food Safety in the Brewing Industry:
Starting a food safety plan and meeting regulatory requirements

Dustin Helsel
Quality Systems Administrator
Founders Brewing Company
Purpose & Goals

• Importance of Food Safety
• Learn about FDA Requirements for Food Manufacturing
• Implementation Ideas – How Founders does Food Safety!
Agenda

• Why do we care as members of the brewing industry?
• What does the FDA require?
• Food safety Implementation
  GBPs – Good Brewing Practices
  HACCP – Hazard Analysis and Critical Control Points
  PRPs – Pre Requisite Programs
• Documentation
• Challenges to food safety programs
• Continuous improvement
Importance of Food Safety

• Safety for the **consumer** is #1

• Improves processes & quality

• It’s the right thing to do
Recalls cost money!
Impacts of Recalls

• Constellation brands recall in 2014 for glass contamination¹
  – Estimated cost of $10 million

• Sierra Glass Recall
  – Cost unknown
  – Defect Rate 1 in 10,000²

• Chemical and Biological hazards also a risk. (cleaning chemicals, diastaticus, etc.)
What does the FDA require?

• FSMA Implementation
• Has several sections
  – (Produce Rule, Protection from intentional adulteration, Preventive controls for animal food, Sanitary transport of food and feed)

• Preventive Controls for Human Food\(^3\)
  – <\$2.5 million annually total revenue must comply by Sept 2019
  – Can submit request to be exempt if considered a “very small business”
    • <\$500k total sales and its locally distributed (275 miles)
Preventive Controls for Human Food

• Hazard analysis (risk based approach)
  – HACCP
• Preventive controls based on hazard analysis
• Sanitary controls required
• Supply chain program
• Recall Plan

• cGMPs (Common Good Manufacturing Practices)
  – 21CFR117 subpart B required by Sept 2018
21 CFR 117 Subpart B cGMPs

117.10 Personnel
117.20 Plant and Grounds
117.35 Sanitary Operations
117.37 Sanitary Facilities and Controls
117.40 Equipment and Utensils
117.80 Processes and Controls
117.93 Warehousing and Distribution
117.95 Holding and Distribution of Human Food By-products
117.10 Personnel

- Sick people shouldn’t handle food
- Hair coverings
- Wash yo hands
- No loose clothing
- No jewelry
- No shorts and closed toed shoes
- No buttons or shirt pockets
117.20 Plant and Grounds

• Mow the grass
• Lights shatterproof or covered
• Free of standing H₂O
• Site has controlled access
  – Contractor/Visitor Management
• Doors remain closed or screened
117.35 Sanitary Operations

- Pest Control – 3rd Party
- Chemical Use and Storage
- Master Sanitation Schedule (MSS)
  - Food Contact
  - Equipment
- Single Use Items
  - Towels, Gloves, etc.
### Example Master Sanitation Schedule (MSS)

#### Cellar 4/5

**TASKS:**

**Daily:**

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>clean and tidy work area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spray valve blocks and drip trays</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>clean and organize chemical area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spray floors esp. around filling + emptying blocks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>checkfill/circulate DA water tank (check w/ PKG)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>upconcentrate chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Weekly:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Initial:</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrub floors, esp. high traffic areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrub drains inc. fuge drain, valve tree, pipes under CIP skid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>scrub tank feet, fuge platform, CIP skid feet, Prop feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide sample of caustic and acid solutions to lab during a CIP-Record conductivity on the sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrub under Filling/Emptying block pipes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean the inside of all chem dosing pump housings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>spray/scrub shrouds inside tank top plates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inspect/change product gaskets at fuge valve stand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect/Clean the CIP screen filters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIP DAW tank (check w/ PKG)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Revision #: 4**  
**Effective Date: 09/13/17**  
**Document #: CR-FM-007**  
**Status: Approved**
Chemical Storage
(Improper) Chemical Labeling
Label All Chemicals

AC36
Foaming Chlorinated Cleaner

DANGER
Harmful if Swallowed
Harmful in contact with skin
Causes Serious Eye Damage
May be harmful if inhaled
Wash hands after handling
Do not eat, drink, or smoke when using this product
Wear protective gloves, eye protection and face protection
If swallowed call poison center and rinse mouth
If on skin wash with plenty of soap and water
If in eyes remove contacts if present and rinse cautiously for several minutes
Wash contaminated clothing before reuse

CHLORINATED
CAUSTIC

SKIN / EYE
IRRITATION

Ingredient

Galacid
Lactic Acid

DANGER
Causes skin irritation.
Causes serious eye damage.
Wash hands thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin wash with plenty of water
If in eyes rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.

Galactic Inc.
PO Box 280424
2700 W. Silver Spring Dr.
Waukesha, WI 53186
(414) 452-1990

Azacide Chemical
PO Box 728
Lantana, FL 33463
(382) 824-9000
117.37 Sanitary Facilities and Controls

- Bathrooms must work
- HW sinks are available to all
- Bathroom doors don’t open into production
- Doors self close
- Design your facility to accommodate this
Hand Wash Sinks

1. Suitable Drying Devices
2. Hand soap required
3. Warm water
4. Labeled HW Only
117.40 Equipment and Utensils

• Brush program
• Bucket program
• Allergen program***
• Cleanable
  – Stainless equipment
  – Plastic brushes (no wood)
# Brush & Bucket Program

<table>
<thead>
<tr>
<th>Brush Color</th>
<th>Purpose</th>
<th>Ingredients (Hops, Coffee, etc)</th>
<th>Special Instructions</th>
</tr>
</thead>
</table>
| White       | Product Contact Only - To be used only on product contact parts and indirect product contact parts (white bristle-SIP/yellow bristle-CIP) | Caustics (CS17 & CS12) | • Packaging utensils and Cellar/Brewhouse utensils must never be used interchangeably due to the risk of transporting broken glass.  
• **Blue** floor utensils must only be used to clean floors by the bottle depal. All other red utensils are to be used throughout the rest of packaging.  
• All utensils must be stored off of the ground in the designated rack to prevent cross contamination concerns.  
• White utensils (Product Contact) must be clean and sanitized prior to use |
| Yellow      | Cellar and Brewhouse - External Equipment Cleaning | Nitric Acid Only (CS35) | |
| Black       | Cellar and Brewhouse - Floor and Drain Cleaning | Sanitizers  
• Perasan  
• Iodophor  
• Acid Sanitizer (CS584) | |
| Blue        | Packaging - Equipment and Depal Floors Cleaning (Glass Line - Broken Glass Potential) | Blowoff & Waste | |
| Green       | Packaging - Equipment Cleaning | | |
| Red         | Packaging and Warehouse - Floors and Drains | | |
*Allergen Requirements*

- FDA/TTB doesn’t require ingredients statements
- Wheat common in brewing industry
  - 1 of the 8 major allergens
- May come a day when its required
- Rapid testing methods are available
Recalls by Percentage

Salmonella 36%
L. monocytogenes 18%
Undeclared allergens 34%
Other 12%

Figure 1: Distribution of Primary RFR Reports: 2009–2012

117.80 Processes and Controls

• Records maintained for glass breakage
• RM are covered prior to use
• RM & ingredients must be off floor at all times
• Labels are easily and accurately accessible
• Segregate raw materials.
  – Don’t put dirty kegs or wood barrels next to malt or finished beer.
• Material handling containers are used separately from other use containers
117.93 Warehousing and Distribution

- Dry
- Free of debris and dust
- Transport vessels should be inspected
- COAs and BOLs come with ALL R.M.
- Forklifts don’t leak/ inspected prior to use
- Trash and waste is stored away from RMs and finished goods
**Lot Analysis**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>CARAMEL MALT 10L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot Number</td>
<td>SH0143025</td>
</tr>
<tr>
<td>Analysis #</td>
<td>10354</td>
</tr>
<tr>
<td>Customer PO#</td>
<td>15929</td>
</tr>
</tbody>
</table>

**Malt Analysis**

- Bushel Weight, lb/bu: 53.00
- Mealy, %: 0.0
- Half-Glasy, %: 16.0
- Glaszy, %: 84.0
- On 7/64" screen, %: 30.3
- On 6/64" screen, %: 44.7
- On 5/64" screen, %: 18.8
- Thru 5/64" screen, %: 6.2
- Motetura, %: 7.8

**Wort Analysis**

- Conversion, mln: <3
- Filtration: NORMAL
- Color, °Lovibond: 12.00
- Fine Grind, DB %: 78.7
- Fine Grind, As Is: 72.6

Bob Hansen  
Manager of Technical Services
Basic Supplier Expectations

• Request Documents (Questionnaire)
  – COAs
  – COCs (Or Continuing Letter of Guarantee)
  – BOLs
  – Certifications (ISO9001, HACCP cert, SQF, etc.)

• Visit them or have a beer with them!
### Raw Material Vendor Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you challenge your traceability program annually for one step up and one step down?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site Security?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Material Vendor Questionnaire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company Name:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company Address:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Person and Position:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Info (Phone #, Email)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who is responsible for contact with us regarding quality matters? (please include contact info)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Types of Products Manufactured/Warehoused: (Hops, Grain, Nuts, Coffee, Chemicals, Packaging Materials, Etc)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does your company have a food safety plan implemented and can you provide it upon request?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Does your company have a quality management system?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Are you certified to any food safety/quality management standards (ISO22000, SQF, HACCP Certification, etc.)?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>If so, which ones? (Please provide certificate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you allow supplier audits/inspections from customers?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>At minimum, do you have a program in place for the following and do you retain records of each:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee Hygiene?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Traceability?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Cleanliness/Sanitation?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Storage of Materials?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>HACCP/Food Safety?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Site Security?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Contamination Prevention?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Do you maintain records of training for the above programs?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Are personnel aware that the products supplied are used for manufacturing of a food product?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Do all facilities have a pest control program in place?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Do you have a procedure in place for product recall?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Do you challenge your traceability program annually for one step up and one step down?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Do you follow current GMPs (Good Manufacturing Practices/GAPs (Good Agricultural Practices))?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Are sites inspected by the FDA or other governing bodies?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Are you able to provide Certificate of Analysis with each batch/lot sent to Founders Brewing Co.?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Is there a FIFO program in place for all incoming and outgoing materials/finished goods?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Does each lot/batch have an identification number?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Is your product tested periodically throughout the process to assure it is within defined specifications?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Is the final product tested prior to shipment to assure it is within specifications?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Do you have an approved supplier list and are all written specifications for incoming raw materials defined?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>At minimum, does your BOL display the following:</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Name of product, Site Location, Lot Number, PO Number, Seal Numbers</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Can you provide a continuing letter of guarantee stating that you are in compliance with all federal food manufacturer regulations and will continue to provide a high quality food/food contact product?</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
</tbody>
</table>
117.95 Holding and Distributing Human Byproducts for Animal Feed

- Clean storage vessel
  - Prove that it is clean
- Containers holding byproducts must be labeled
- Trucks hauling byproduct must be examined prior to use
HACCP

• **Hazard Analysis and Critical Control Points**
  – Risk Based Approach
• Pre-Requisite Programs Established
• 2 Day Course – MBAA
• Fully Documented
HACCP Preliminary Steps

1. Assemble HACCP Team
2. Describe product and its distribution
3. Describe the intended use and consumers
4. Develop flow diagram
5. Verify flow diagram
7 Principles of HACCP

1. Conduct a Hazard Analysis
2. Determine CCPs
3. Establish Critical Limits for each CCP
4. Establish a Monitoring System for each CCP
5. Establish Corrective Actions
6. Establish Verification Procedures
7. Establish Record Keeping & Documentation Procedures
Quality Systems

**Quality Statement:** What you stand for

**Policies:** Requirements for system

**SOPs/WIs:** How are we going to accomplish the requirements

**Records:** This is proof we accomplished the requirements
Quality Policies (These are PRPs)

FBC Has 21 Currently

- Microbiological Testing
- Calibration of Critical Testing Equipment
- Product and Package Testing
- Cleaning and Sanitation
- Product Handling and Rotation
- Pest Control
- Yeast Management
- Sensory Testing
- Traceability
- Good Brewing Practices
- Product Shelf Life and Date Coding
- Raw Material Selection and Receiving
- Training
- Corrective Actions
- Glass Breakage
- Document Control and Records Management
- Repackaging Equipment
- Design and Development of New Products
- Recipe Management
- Domestic Customer and Regulatory Labeling Requirements
- HACCP Policy
**FBC currently has 481 living documents in our document control program**
## Training Matrix

<table>
<thead>
<tr>
<th>CR-SOP-017</th>
<th>Coffee Preparation</th>
<th>OK</th>
<th>OK</th>
<th>OK</th>
<th>OK</th>
<th>OK</th>
<th>OK</th>
<th>OK</th>
<th>OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR-SOP-018</td>
<td>Carbonator</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-020</td>
<td>Purging and Depressurizing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR-SOP-021</td>
<td>Cellar Environmental Cleaning - Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR-SOP-023</td>
<td>Cellar Environmental Cleaning - Facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR-SOP-024</td>
<td>Barrel Emptying</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-025</td>
<td>Barrel Filling</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-027</td>
<td>Walk-A-Butt</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-028</td>
<td>Firkin Filling</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-029</td>
<td>Hand Packaging</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-031</td>
<td>Cell Count and Viability</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CR-SOP-034</td>
<td>Yeast Harvest</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CR-SOP-035</td>
<td>Yeast Brink Setup</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CR-SOP-036</td>
<td>Yeast Brink CIP</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CR-SOP-037</td>
<td>Centrifugation</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-038</td>
<td>Oak Chip Preparation</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-039</td>
<td>Botec Overview</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-040</td>
<td>CIP a Fermenter or BBT (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-041</td>
<td>CIP Green Beer Line (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-042</td>
<td>CIP/SIP a Tank Street (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-043</td>
<td>CIP/SIP Yeast Harvest Line (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-044</td>
<td>Crashing a beer (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-045</td>
<td>Deaerated Water Production and Maintenance</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-046</td>
<td>Fassing a Tank (Cellar 4)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-047</td>
<td>Green Beer Production (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-048</td>
<td>SIP a Fermenter/BBT (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-049</td>
<td>SIP Green Beer Line (Botec)</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-050</td>
<td>Upconcentrating</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-SOP-056</td>
<td>Shift Change SOP</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-WA-001</td>
<td>Chemical Use Rate Chart</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>CR-WA-003</td>
<td>Secondary Chemical Jugs</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>QS-SOP-001</td>
<td>QC Hold Procedure</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>QC-SOP-007</td>
<td>ATP Testing</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>QC-SOP-019</td>
<td>QC Release for Packaging</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>QS-WA-001</td>
<td>Brush Program Overview</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>QS-WA-009</td>
<td>Bucket Program</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
</tbody>
</table>
Improving The System

• Self Audits
  – Monthly GBP Audits
  – Annual PRP Audits

• Customer Response

• Corrective Actions
<table>
<thead>
<tr>
<th>Personnel</th>
<th>235</th>
<th>235</th>
<th>WTF</th>
<th>WTF</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are all employees wearing proper attire suitable to prevent contamination of food and food contact surfaces? (This includes no jewelry on processing floor, except a single wedding band, shirt pockets being free of all items, and no buttons on shirts).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Are all employees wearing proper shoes in processing areas that are made of non-absorbent materials and are fully enclosed?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Are there adequate hand washing stations where hand washing is required? Also are there hand washing sinks available in food consumption areas and are they accessible?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Are there suitable drying devices or sanitary towels for drying hands?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Are there signs directing employees to wash hands prior to touching unprotected food or food contact surfaces?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Are all refuse receptacles constructed and maintained in a manner that protects against contamination of food?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Are proper hair covers being used when needed? Refer to FBC-POL-011 for tasks requiring covers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Are all personal belongings, including bags and clothing, stored in proper locations? Not on processing floor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. All food and drink removed from processing and raw material areas? (Only allowed is drinking water) And is food consumed in designated areas? (Break rooms, offices, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Are designated food storage and consumption areas maintained in a hygienic manner?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Are all employees maintaining personal hygiene, including washing hands prior to starting work? This includes sanitizing hands when necessary (working or touching food contact surfaces)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Are gloves that are being used in processing areas clean, free of rips, made of non-absorbent materials? Latex gloves should be avoided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tracking Improvement & Goals

2017 GBP Percentage

- 235
- WTF
- Goal

- January: 95.74%
- February: 95.74%
- March: 95.74%
- April: 94.68%
- May: 93.62%
- June: 90.43%
- July: 93.62%
- August: 91.49%
- September: 92.55%

80% - 100%
Customer Response

• Track each one with specific info
  – Date, product type, description of complaint, purchase location, etc.
  – Excel is where it’s at!

• Easy for consumer
  – Quality Contact on Webpage
  – Info Email
  – Phone
Corrective Actions

• Improves processes
• Areas that can benefit from CAs
  – Quality, Safety, Process Improvement, Environmental
• Driven by customer response, KPI tracking, observations, and audits
Overcoming Challenges

• Starting From Scratch
• Rapid Growth & Expansion
  – Time to train employees
• Employee Buy In
• Management Support
Thank you to Founders, District Michigan, and everyone for coming!

Contact Info
– helseld@foundersbrewing.com
Questions?
Sources

1. Constellation Brands Voluntary Recall
2. Sierra Nevada Glass Recall
3. Left Hand – Nitro Milk Stout Recall Notification
4. FDA Guidance Regulation for FSMA and Compliance Dates
5. Michigan Dept. of Agriculture Step by Step for new Food Establishments
   – (MDA Food Step by Step for new Establishments)
6. MBAA Food Safety Site