Food Safety in the Brewery

A short review of the tools available to create a brewery HACCP plan

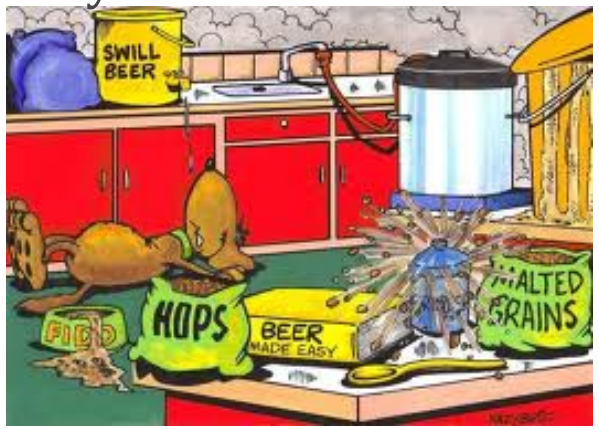
The future of Craft Beer involves Safety

- Why food safety?
  - Do you CIP?
  - Do you Bottle?
  - Raw Materials-CO2, Malts?
  - Process Aids-Zinc, Antifoam

Craft Beer is food!

- Physical Hazards – Glass Inclusion
  - Number one for recall
- Chemical Hazards -
  - 1990 Perrier Recall Benzene in CO2
- Biological Hazards – Beer is free of pathogens, but contamination causing secondary fermentation could cause over pressurized bottles

Food Safety Starts with GMP: Quality sets the foundation



HACCP = Safety

Objective

- Importance of food safety
- Hazard Analysis and Critical Control Points
  - Starting a HACCP program
- Wholesalers and customers are starting to ask if you have a HACCP plan

Outline

- What is HACCP?
- Why HACCP?
- The seven principles and 12 steps to creating a HACCP program
- Example of a CCP with MBAA HACCP tools
- Example of a non-CCP with MBAA HACCP tools
- Conclusion – Beer regulation and FDA is knocking at the door, start now and be ready

Ultimately - if you aren't prepared you may not be selling beer!

Terminology

- **HACCP:** Hazard Analysis Critical Control Points
- **HACCP plan:** The written document describing the procedures to control food safety to be followed based on the HACCP principles.
- **Good Manufacturing Practice (GMP):** The foundation for establishing order and cleanliness in a brewery. GMP's are required by the FDA for all food and beverage manufactures.
- **Food Safety Modernization Act (FSMA):** Signed into law January 2011-a prominent law encompassing all beverage manufactures.

Terminology continued

- **Critical control point (CCP):** Any point or procedure in a food process where loss of control may result in an unacceptable health risk.
- **Critical limit:** Prescribed tolerances established to control potential or actual hazards identified in a critical control point.

What is HACCP (CCP)

- It's not just an acronym but a tool

- Hazard Analysis and Critical Control Points

  …a simple and specialized approach to help manage and prevent health hazards when consumers drink your beer!

- HACCP is a method that simplifies the process of hazard analysis.
  - Safety from contaminants:
    - **Microbiological**: mycotoxins
    - **Chemical**: process aids-antifoam
    - **Physical**: glass inclusion

Why HACCP (FSMA)

- The FDA
- Consumer Confidence
- Recall - Costly
- Remake - Costly
- Repackage – Costly
- Reship - Costly
  - *Your business depends on it!*

HACCP is a process

- The seven principles and 12 steps to creating a HACCP program – Principles are part of the 12 steps
- Compile a HACCP manual
- Manage a food safety deviation and program failure
- Establish a validation and verification component to the HACCP program

The 12 basic steps to implementing a HACCP program.

- They are:
  1) Assemble HACCP team
  2) Describe product
  3) Identify intended use
  4) Construct process Flow Diagram and Plant Schematic
  5) Conduct on-site verification of Flow Diagram and Plant Schematic

12 Steps cont. (7 principles)

6) Identify hazards. List preventative measures to control them - (principle 1)
7) Determine Critical Control Points - (principle 2)
8) Establish limits at each Critical Control Point - (principle 3)
9) Establish procedures to monitor Critical Control Points - (principle 4)
10) Establish corrective action to take in case of a deviation - (principle 5)
11) Establish procedures to verify systems are working correctly - (principle 6)
12) Establish effective record keeping - (principle 7)

Assemble HACCP team

Ideally would include experienced personnel that understand process and are trained in HACCP procedures

A small brewery HACCP team might only be two people

Describe the product

Important Step: Identify potential hazard and documentation for customer

MBAA – HACCP Tools

List every Raw Material used in this Product Profile that has an identified significant hazard as identified in the Raw Material Hazard Analysis.	Identify the potential food safety hazard that could be introduced or intensified with the listed raw material or processing step.			Is the potential hazard controlled or prevented by Prerequisite / Support Programs?	Is the potential hazard eliminated or reduced to an acceptable level at a downstream process step?	Can a viable product be produced if this processing step fails?
List every process step as outlined on the Process Flow Diagram.	Be as specific as possible when listing the hazard and its source.			If Yes:	If there is a downstream elimination/reduction step,	If YES, this step is a CCP:
Go to Column 2.	If no hazard is identified, write "None."			List the programs that will control the introduction or intensification of the hazard(s).	identify the LAST elimination/reduction process step.	- List CCP
Note: When you are at the last processing step that would eliminate or reduce a potential food safety hazard, go to Column 5	Go to Column 3.			If No:	If there is not a downstream elimination/reduction step, write "None."	- Identify number.
				The potential hazard is not prevented by Prerequisite/Support Programs; write "None."	Continue to the next hazard or process step.	If No, this is not a CCP:
				Go to Column 4	If you are at an identified elimination/ reduction step, proceed to Column 5.	- Enter "No"
		Likelihood	Severity		Note: If there is no control/prevention or downstream elimination/reduction for an identified food safety issue, stop, modify the step, process, product, or Support Programs.	- Brief justification for answer, such as "Not a viable product." Go to the next hazard or process step.
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	C					
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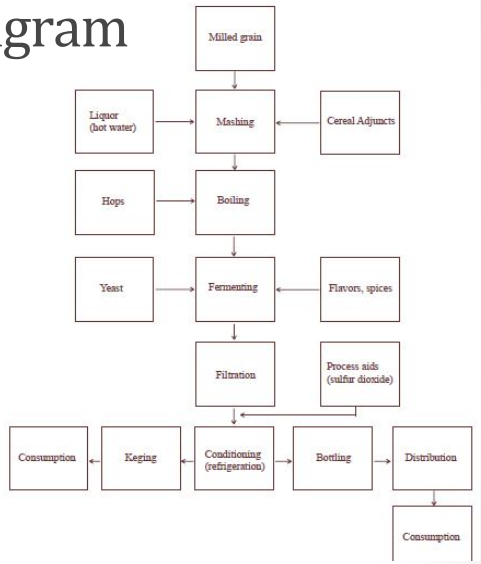
Identify intended uses

- I think we all know this…

Process Diagram

Create as much detail as possible



Verify on site the Flow Diagram and Plant Schematic

→ Walk the process

List hazards associated with each step (Principle 1)

Receiving Raw Material

B-Mold
C-Sanitation
P-Metal pieces

Determine Critical Control Points (Principle 2)

- CCP's are not about quality but safety
- If the hazard is controlled it is not a CCP

Example:

Addition of antifoam is FDA controlled additive that has maximum allowable limits

Establish Critical Limits (Principle 3)

- The is the max or min recordable value a biological, physical or chemical parameter must be controlled at a specific CCP to prevent a food safety hazard.
- Must follow critical control limit if it has been established by the FDA
  - Established through experimentation
  - Based on research
  - Each CCP has a critical limit
  - Critical Limits in Brewing
    - EX: Anti-foam (Dimethylpolysiloxane), FDA regulates to 10ppm

Establish Monitoring Procedures (Principle 4)

Conducted by operator or instrumentation (system)

- If monitoring is not constant then it needs to be statistically appropriate.
- Look for trends…
  - EX: Antifoam addition to be recorded on batch sheets
  - Measuring devices checked to determine continued accuracy
  - SOP necessary to maintain compliance

Establish Deviation Procedures (Principle 5)

- What happens when process drifts and critical control limits are reached.
- Or monitoring procedures are no longer affective
- Deviation procedures help gain control of the process and guide monitoring procedures.
- Ex: Antifoam limit exceeded, batch on hold, samples sent out for third party analysis

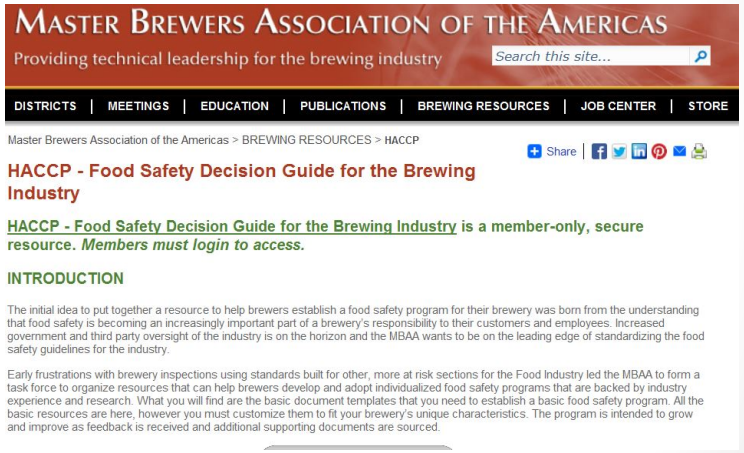
Establish Verification Procedures (Principle 6)

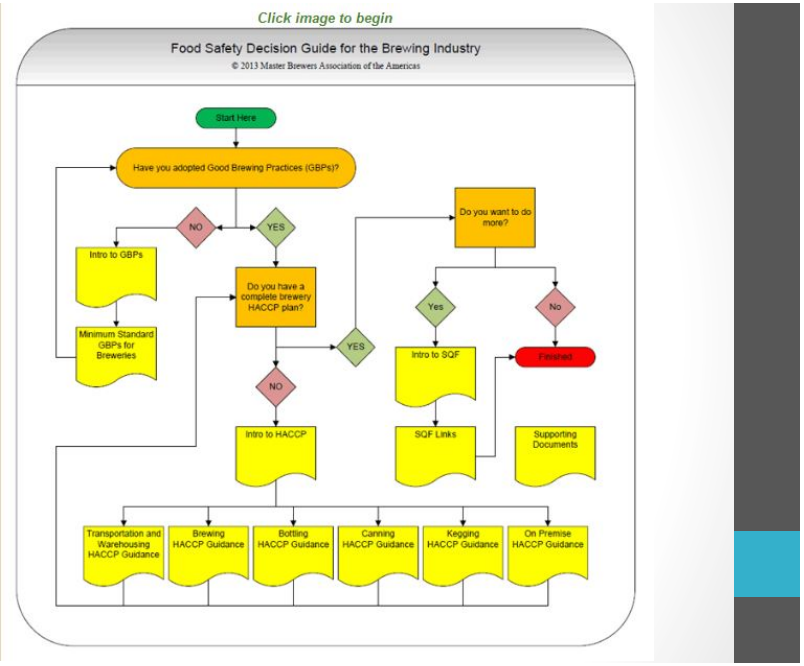
- Ex: Antifoam received should have COA and meet specifications
  - Audit the monitoring and deviation procedures
  - Review records and SOP's
  - Challenge and test the process

Establish record keeping/ documentation for Principles one through six (Principle 7).

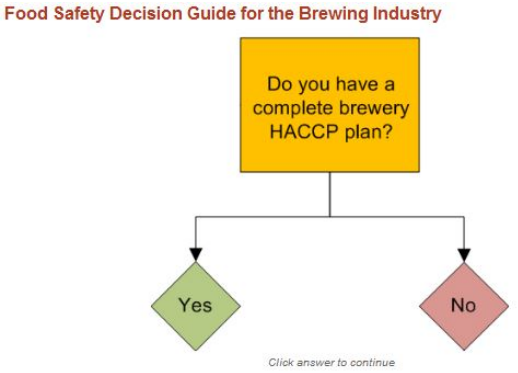
- Critical for verification and inspection
- Required for FDA food safety programs and facilitates your recall program
- Could save you from recalling all of a production run verses a portion

MBAA Tools for HACCP





MBAA – HACCP Tools



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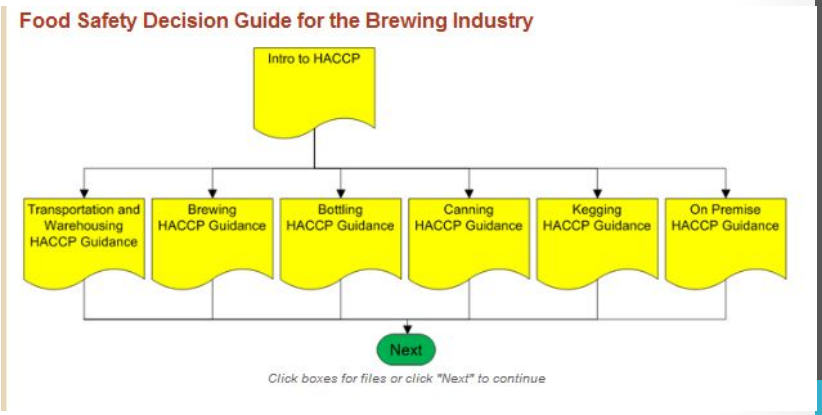

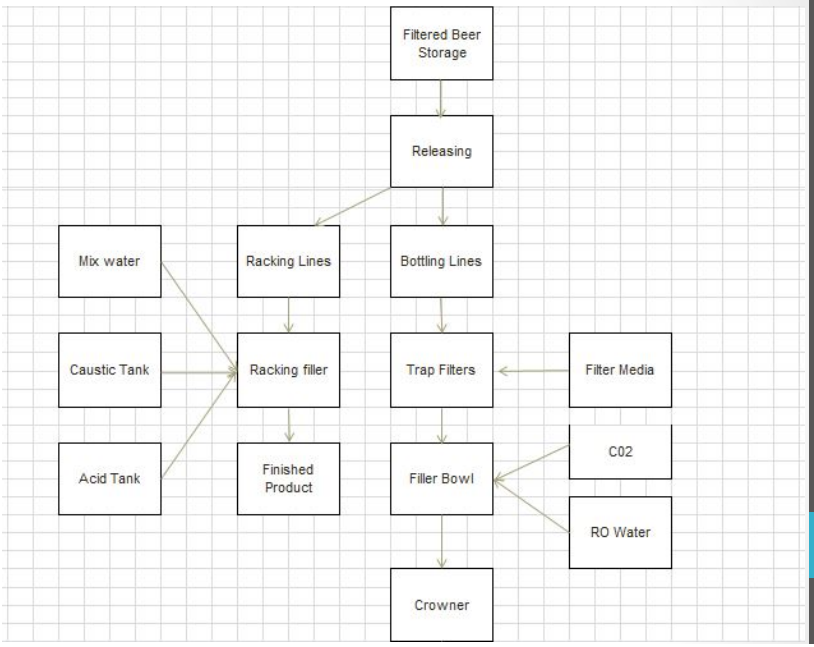

MBAA – HACCP Tools

Bottling Potential Hazards

Hazard:	Any biological, chemical, or physical contamination in the product that may cause an unacceptable health risk to the consumer
CCP for bottling lines:	
1	Inspection for torn plastic wrap or missing cardboard is required.
2	Bottle rinser routinely verified as working ensuring not physical contamination from manufacturer to filler.
CCP for filler bowl:	
1	When bottle breakage occurs in the filler, the operator must remove all uncrowned bottles from the filler and spray down all broken glass.
CCP for racking filler:	
1	Hourly checks of all chemical tanks required to assure proper chemical levels and proper cleaning of kegs.

MBAA – HACCP Tools

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Why HACCP?

- Ultimately…
  - Customers are asking and if you aren't prepared you won't be selling beer
  - FDA is becoming more involved with all aspects of food, even those not associated with pathogens

MBAA References (Website)

- Guide to Creating an HAACP Plan
- Implementing an HACCP Plan
- Clemson HACCP for Microbreweries
- Hazard Analysis and Critical Control Point Principles and Application Guidelines
- Mycotoxins in Hops
- Vendor Requirements Letter
- Glass Breakage Protocol
- Glass Breakage Log

MBAA References (Website)

- **Files From the Food Safety Diagram**
- **Good Brewing Practices (GBPs)**
  - Introduction to Good Brewing Practices (GBPs)
  - Minimum Standard GBPs for Breweries
- **Hazard Awareness and Critical Control Points (HACCPs)**
  - Introduction to Hazard Awareness and Critical Control Points (HACCPs)
  - Transportation and Warehousing HACCP Guidance
  - Brewing HACCP Guidance
  - Bottling HACCP Guidance
  - Canning HACCP Guidance
  - Kegging HACCP Guidance
  - On Premise HACCP Guidance
  - Receiving and Storage HACCP Guidance.xlsx
- **Safe Quality Food (SQF)**
  - Introduction to Safe Quality Food (SQF) or ISO
  - SQF links

Conclusion

Government regulation is knocking at the door.

Now is the time to start a HACCP plan so your brewery is prepared.