Make a copy of this on your own drive then delete this and other non-relevant sections. Use this QC Manual template as a starting point and update with details relevant to your brewery. Each section includes questions to help guide you on what type of information you might want to include in a QC manual.

We all know quality is important, but we don't always like to talk about it, or actually put a plan in place. It doesn't have to be complicated, but it does take time and effort. This template was designed to get you started.

Feel free to add or take away sections that don't fit your brewery's needs. This should be a living document that is updated often as your brewery grows and evolves.

Intro

Include a brief overview of what quality means to your brewery and why you have a quality program in place. Everyone in the brewery is responsible for the quality of your product, not just those in the brewing or quality departments. Make everyone feel empowered to participate in the Quality Assurance and Quality Control (QAQC) program. You may choose to list roles or include an organization chart here.

Ask employees what quality means to them and compile a list or short paragraph detailing why quality is important at your brewery and what it means to everyone there.

A quality program doesn't need to start with everything included in this manual. Start with one section at a time and add to it as you go. It's perfectly fine to start small and add to your program as you go. Every brewery is different and no two QC plans will look the same.

Check out https://zymologylabs.com/resources for more tips on starting a quality program.

Safety

Reference any safety documents you have in the brewery, such as Standard Operating Procedures, Safety Data Sheets, Safety Policies, and where to find them. You may want to make a list or describe in detail safety concerns found in your brewery. Include instructions on how to report safety concerns and who the main safety contact at your brewery is.

Document Control/GMPs

A big part of your quality control program will be writing information down and organizing paperwork. Find a system that works for you and describe it here. Include expectations of when and where information is recorded and how it will be used.

Include a section on Good Manufacturing Practices. How do you ensure your brewery meets FDA guidelines?

For members of the Brewers Association there is a detailed checklist available at: https://www.brewersassociation.org/educational-publications/good-manufacturing-practices-for-craft-brewers/

The Master Brewers Association of the Americas also has resources available to brewers regarding compliance: https://www.mbaa.com/brewresources/foodsafety/Pages/default.aspx

Templates/information sheets included in Quality Control Starter Kit

1. GMP Introduction - what/why - info sheet
2. Document control - info sheet
3. SOP 001: how to write SOPs - article
4. SOP template - template
5. SOP list/sign off form - template

Raw Materials and Packaging Supplies

Ingredient Inspection

Include a section on how often/how much you inspect your raw materials and what you look for. You might want a log including lot numbers that gets checked off after inspection. What do you do if something doesn't meet your standards? Where do you record lot numbers? Can you trace which ingredients went in which beer?

Link to any relevant SOPs or safety information.

Water

Water should be tasted daily by the brewer and available at sensory panel. See section on sensory panel for more detail. If water is sent out to be tested include where, how often, where results are stored, and who is responsible for sending it out. If you do your own in house water testing include what is tested, how often, and where results are stored. How is this information used to make adjustments when brewing?

Hops

Hops should be visually and organoleptically evaluated before use. Include a list of what to look for, such as discoloration, unusual order, noticeable pest damage. What happens if they do not meet your standards? Who needs to be notified? Where are lot numbers and alpha acids recorded?

How are hops stored when they arrive at the brewery and any hops remaining in an opened bag. Open bags may be re-sealed using tape and tagged with the date opened, expiration date, and the alpha acid. If you use another container or a vacuum sealer include that here and refer to an SOP if available.

How long do you store hops? What is the shelf life after they are opened? The length of time in which open bags are used may be evaluated on a case by case basis.

Who orders hops? Where are they ordered from? Do you have a hop contract? How long do they take to come in?

Malt

Malt should be visually, and organoleptically evaluated by the brewer before use. What anomalies should brewers be looking for? Who is that reported to or where is it recorded? Where are lot numbers recorded? Where are malt analysis sheets stored? Is a sieve test performed? How often? Who does it?

How is malt stored? Malt should be stored on pallets and never on the ground.

Who orders malt? Where is it ordered from? How long does it take to come in?

Yeast

Do you perform a cell count and viability test before pitching yeast? Do you pitch by weight or volume? How do you pitch your yeast. Link to relevant SOPs. Who performs these tests and when? What do you do if the viability is below 90%? Do you have a viability cut-off? Do you do any micro tests before use?

Do you collect and re-use yeast or use fresh pitches. Do you use dry or liquid yeast? Where do you order it from? If you re-use, how many generations do you go? When do you collect yeast? How do you store it? How long can you store it? Where do you track this information? How do you keep track of separate yeast strains? Do you acid wash?

Who orders yeast? How long does it take to arrive? How is it stored? Do you need to prop it up? If so, how do you prop it up? Link to relevant SOPs and safety information.

Healthy yeast leads to more consistent, predictable fermentations, and fewer off flavors.

One of the best ways to ensure healthy yeast is to perform yeast cell counts and viability testing on your yeast. You can purchase everything you need for cell counting for under $500.

Templates/information sheets included in QC Starter Kit

6. Cell Counts - SOP
7. Cell count calc sheet volume
8. Cell count cal sheet weight
9. Cell counts/yeast tracking - template

Packaging Materials

Where are packaging materials ordered from? How long do they take to come in? You may wish to include a table if they come from a variety of places. Who orders packaging materials? What type of inspection is done? Are photos taken of delivery trucks? Where are items stored? How are they stored? Can pallets be stacked? How high? Do you have an inventory list? Who manages it? Who is certified to drive a forklift?

Link to relevant SOPs, highlight safety information.

Cleaning

Include your chemical supplier, representative and contact info. Keep a log of chemicals when they come into the brewery - See Chemical Receiving Log

Refer to any cleaning SOPs and give an overview of when tanks are cleaned and how they are cleaned. How long can a tank stand empty before it needs to be re-sanied? How often are they getting acid or caustic? Record chemical titrations when cleaning tanks to ensure the proper amount of chemical is being used. Where are the titration kits stored, where is the titration log stored? What information needs to be recorded? Do you use ATP swabs? Where do you swab and where are the results recorded? What is an acceptable range and when does it need to be re-cleaned.

Link to relevant SOPs, highlight safety information.

Suggested charts to reference - Not included in QC Starter Kit
Add chemical use chart
Give overview of tank cleaning conditions - how often/when
Reference tank cleaning SOPs
Titration concentrations
validation /cleaning log

Chemistry

This section details the steps requiring chemical analysis. Once you have enough data collected you can set specifications for each beer. You might start out based on calculated values but once you have a better understanding of how your beers ferment and what the expected pH, IBUs, ABV, etc. will be you can keep a close eye on consistency between batches. If you start to notice a beer slipping out of spec you can make changes or adjustments before it becomes noticeable to your consumers. This helps you stay proactive instead of reactive. The more you know about your beer the more you can control.

What do you test for in your brewery? Who tests it? How often? Where are results stored? How is data reported? How often? Do you use an outside lab for additional testing? Where do you send samples to? Who sends samples out? Are there tests that need to be done before a beer can move to another tank, or before a beer can be packaged?

Templates/information sheets included in QC Starter Kit

10. Chemical receiving log - template
11. Spec sheet - template
12. Gravity/pH tracking sheet - template (need to open in excel to compare graphs)
13. Calibration log - pH meter - template
14. Sampling plan
15. Info sheet

Link to relevant SOPs, highlight safety information.

Reporting

How will this data be communicated to the rest of the brewery? How will it be used to make improvements?

Templates/information sheets included in QC Starter Kit

16. Weekly QC update email draft
17. Potential QC issue email draft

Microbiology

A brewery is full of places for unwanted microbes to hide. We even intentionally bring them into our breweries. Thorough cleaning and early detection are your best defenses against a beer spoiler.

What type of media to you use in your brewery? What other ways do you test for infection? What types of bacteria and wild yeast are you trying to detect? Who collects and plates samples? How often? When are results determined? What happens if you find positive results? Is packaging dependent on micro results?

Templates/information sheets included in QC Starter Kit

18. Sterile Wort instruction
19. Micro results - Template

For more information on using HLP to detect *Pediococcus* and *Lactobacillus* click here

Link to relevant SOPs, highlight safety information.

Reporting

Determine how you will report micro results. You may choose to only alert others when there are positive hits or send out a daily or weekly update with which beers were tested and the results.

Positive results should be re-tested as soon as possible to confirm.

You may report chemistry results with micro or keep them separate. See email templates in the Chemistry Reporting section.

Sensory

When and where do you hold your sensory panel? How are new panelists trained? Who runs the panel and evaluates results? What happens when a beer doesn't pass sensory?

For more information on setting up and running a sensory panel, see "Start Your Sensory Panel Today" a free ebook

Templates/information sheets included in QC Starter Kit

20. How to evaluate a beer - quick guide
21. Sensory evaluation form

References -
ASBC - series of sensory webinars, membership required -
https://www.asbcnet.org/lab/webinars/webinars/Pages/default.aspx
Check your beer episode -
https://www.buzzsprout.com/719424/2463356-sensory-part-1
https://www.buzzsprout.com/719424/2697271-sensory-part-2
MBAA podcast episodes - https://www.masterbrewerspodcast.com/118

Packaging

How do you package your beer? Describe what type of packaging you use. Link to relevant SOPs and a maintenance log. Who performs maintenance? What happens when the line goes down? Where do you order parts from?

Highlight safety precautions and what PPE is necessary when working on or near the line. Link to relevant SOPs.

Include a section on dissolved oxygen and what your specs are and what to do if you are over. Don't have a DO meter? Start saving up. There's no way to tell how much oxygen is getting into your beer during transfer and packaging without testing it. This can greatly affect the shelf life of a beer.

Do you have a tank sign off form? What needs to be checked before a beer can be packaged? What if this isn't completely filled out? Do you need passing micro results or ABV tests? Does the head brewer need to taste the beer before it can be packaged? How does the team know what needs to be packaged, how is it communicated?

What are your DO and CO2 specs? What if the beer isn't in range? What do you do when a tank is emptied? What are start up and shut down procedures? Link to relevant SOPs. It might be helpful to have a checklist on hand as well. How is the line cleaned? What chemicals are used? How is cleaning validated?

What information is checked during a packaging run (DO, CO2, fill weights, date code etc.)? Does someone from the lab or packaging team perform these checks? How often are they done?

How do you track beers? What information needs to be on your date code?
Example below:

Date Code

A date code must be printed on the bottom of each can. This code must be in the format:

Batch ID
Date and time

Ex:
IPA23
08/03/20 16:03

Included templates in QC Starter Kit

22. Packaging Checks - template
23. Basic Canning line checklist - checklist
    23a. Packaging check info sheet

Other

Pest Control

Do you use a pest control service? Who? How often do they come? What is required of you? How do you keep pests out of the brewery?

Recall Plan

Put together a recall plan and perform a mock recall. What would you do if you needed to recall a product? Who would need to be notified? How would you locate the beer? How would you communicate to your customers, suppliers?

A recall may be due to a supplier issue and nothing you did. How do you track ingredients and packaging materials?

Check out the BA for more resources on recall plans.
https://www.brewersassociation.org/association-news/guidance-voluntary-market-withdrawals-and-recalls/

Communication plan

Include a section on how and when your team communicates. Do you have daily meetings, weekly meetings, shift update emails. Who do they go to? When do they get sent out? Who makes the schedule? Where is the schedule located? How does everyone know what they need to do for the day?

Audits

You may have a section on audits for your brewery. How often do you perform self audits and what are you looking for? Who is responsible for this?

Equipment/building maintenance

Include a section on equipment and building maintenance. Keep a log book of maintenance done, when and by who. If it was successful or something else needed to happen.

Consumer feedback

Track consumer feedback. Keep a QC library of all packaged beer, at least one six pack. Warm and cold storage if possible. Keep 3-4 months or until your self life is up. If you receive feedback

on a particular batch of beer you can check out the batch for yourself. If you receive multiple comments on the same batch you can dig a little deeper and do some trouble shooting.

Included in QC Starter Kit

Consumer feedback - log

Troubleshooting

Keep track of any trouble shooting you do with a log. Often different types of data are stored in different places and a log keeps all the relevant information together and easy to reference.

When troubleshooting, try to find the root cause of the problem and brainstorm ways to keep the same thing from happening again. Try asking “why” five times to get to the root of why something failed.

Track any changes you make to your procedures on a recipe change log.

24. Troubleshooting log - log
25. RCA - template
26. Recipe Change log

Revision History

When you make changes to your Quality Manual make a note here with the date and section edited. This makes it easy for everyone to reference new sections and serves as a reminder when changes were put in place.

References

Include a list of reference material, internal or external. Do you have a folder where all the SOPs are stored? Where are SDSs stored? Do you keep equipment manuals, contact lists, checklists, COAs, etc. online? Where are they stored?

About Zymology Labs

Zymology Labs, LLC is an independent beer testing lab focused on helping brewers improve the quality and consistency of their beers through education and analytical testing. Learn more at www.zymologylabs.com or email amy@zymologylabs.com.

Please email me with any questions or concerns about this manual. I’m happy to make updates that will help more brewers get their own quality program in place.

Thanks for reading!