BrewTimes™

MAY 2023

BALAJI ENZYME & CHEMICAL PVT LTD

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Introducing BrewTimes :

We M/s Balaji Enzyme & Chemical Pvt Ltd, are pleased to bring to you our May 2023 month edition of BrewTimes.

We are extremely proud to announce our association as the official Media Partners of "BIOFUEL EXPO 2023".

We would like to use this platform to introduce our association with BetaTec, UK for their natural solutions for ethanol recovery in grain and molasses distilleries. The product is revolutionary and unlike any in the market is 100% natural and antibiotics free. Vitahop series of products helps in ensuring optimum yield and keeps the yeast healthy all naturally.

We are extremely proud of announcing our association with IIT Bombay Research Park. We have begun a journey together to work on sustainable, reliable and innovative solutions for the Food and Beverage Industry.

About Our Company :

We M/s Balaji Enzyme & Chemical Pvt Ltd are a leading supplier of Enzymes, Filter aid, Yeast, Hops, Processing aids, Clarifiers and food fortification products to breweries, distilleries, malt extract industry, starch industry, juice and beverage industry, and other food industry.

Vitahop®

Increase profits in BIOETHANOL...naturally

Vitahop® is a range of natural hop extracts, ideal for production of bioethanol from a range of raw material feedstocks, as they protect yeast from bacterial growth, and their acid by-products, during fermentation processes. When used as part of a planned process regime with regular additions, bacterial infections do not develop and spoil yeast fermentations.

When infections do develop, they can quickly get out of control and disrupt production, potentially causing substantial losses and lost revenue. By controlling bacteria and preventing bacterial growth, catastrophic infections can be a thing of the past.

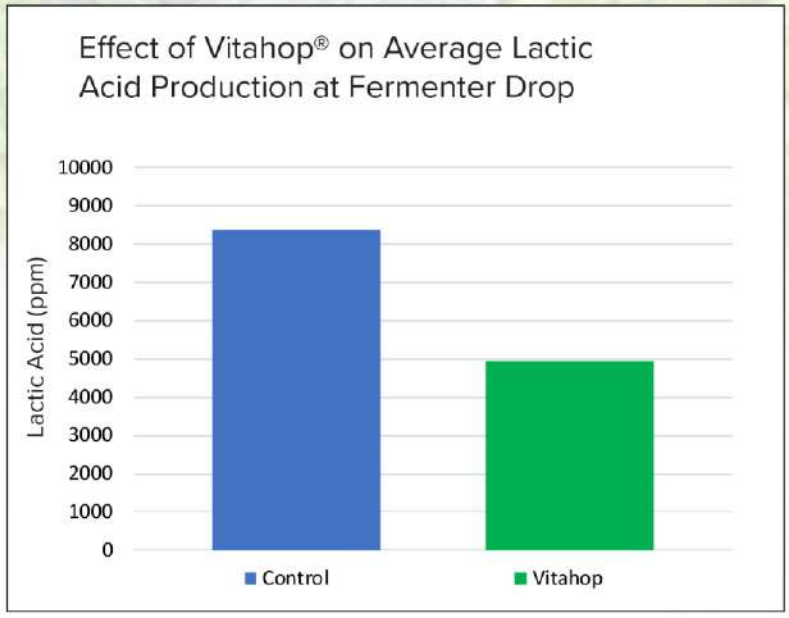
Vitahop® is used in both continuous and batch fermentations. It helps ensure healthy, vitalised yeast growth and during fermentation suppress gram positive bacteria. If bacteria are allowed to prosper, they will compete with and eventually inhibit the yeast, slowing fermentation sometimes to a complete stop, resulting in a "stuck" fermentation. Bacteria will also use up valuable feedstock producing organic acids such as lactic acid, further reducing ethanol yields. Prevent this happening with **Vitahop**®**.**

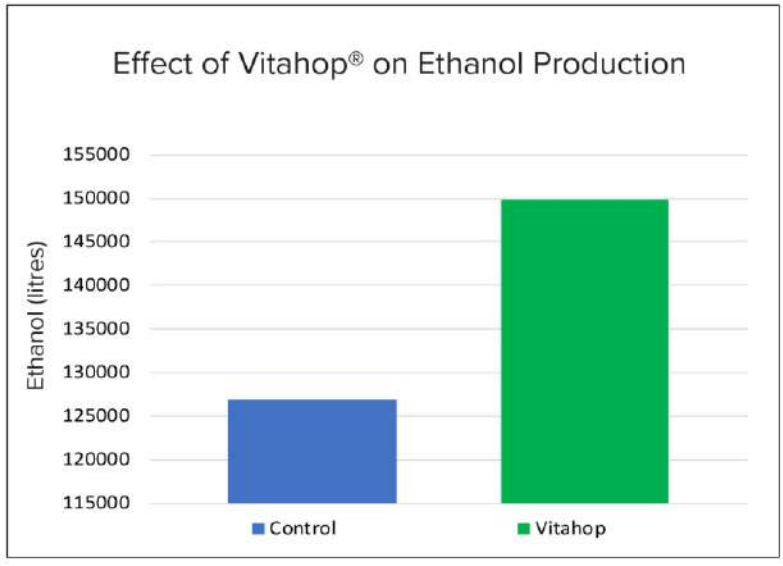
info@betatec.com | **betatec.com** | *efficient by nature*®

BetaTec® hop products

Key Benefits of Vitahop®

- Maintains optimum ethanol yields
- Ensures reliable fermentations
- Keeps yeast healthy
- Controls bacteria
- Demonstrated benefits in ethanol production plants worldwide
- Safe and natural, easy to use
- Safe DDGS for animal feed
- A natural alternative to antibiotics





Unpublished data BetaTec 2015

Vitahop®

BetaTec is the first company worldwide specialising in the application of hops and hop-derived compounds for use in "beyond brewing" industries. Our product portfolio includes natural fermentation aids, antibacterials, flavours and functional ingredients. Our key business areas are alcohol, yeast and sugar production.
All BetaTec products are accompanied by on-site support, process optimisation and consulting.

Please contact our technical experts to learn how Vitahop® can help you sustain improved ethanol yields.

BetaTec Corporate Office
5185 MacArthur Blvd NW, Suite 300
Washington, DC 20016
202.777.4800

BetaTec Innovation Centre
Malvern Hills Science Park
Geraldine Road
Great Malvern, Worcestershire WR14 3SZ
+44(0) 1684 217340

BetaTec® hop products

"Transforming your world with our natural hop solutions"

BetaStab® XL

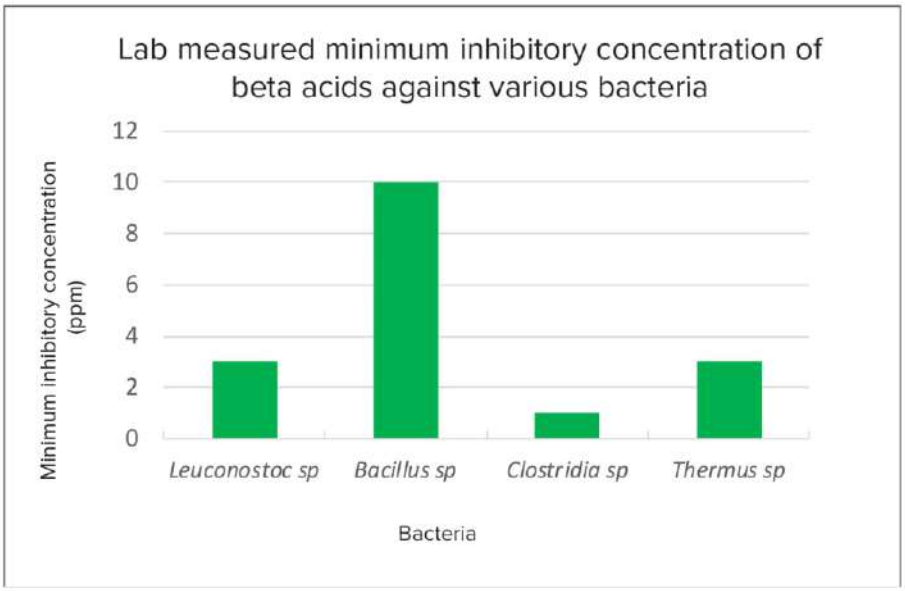
Reduce your sugar losses ...naturally

BetaStab® XL controls problematic Gram postive bacteria found in sugar extraction

Microbial sugar losses are a major problem in sugar production resulting in lower yields, increased processing problems and higher impurities such as lactic acid and dextran.

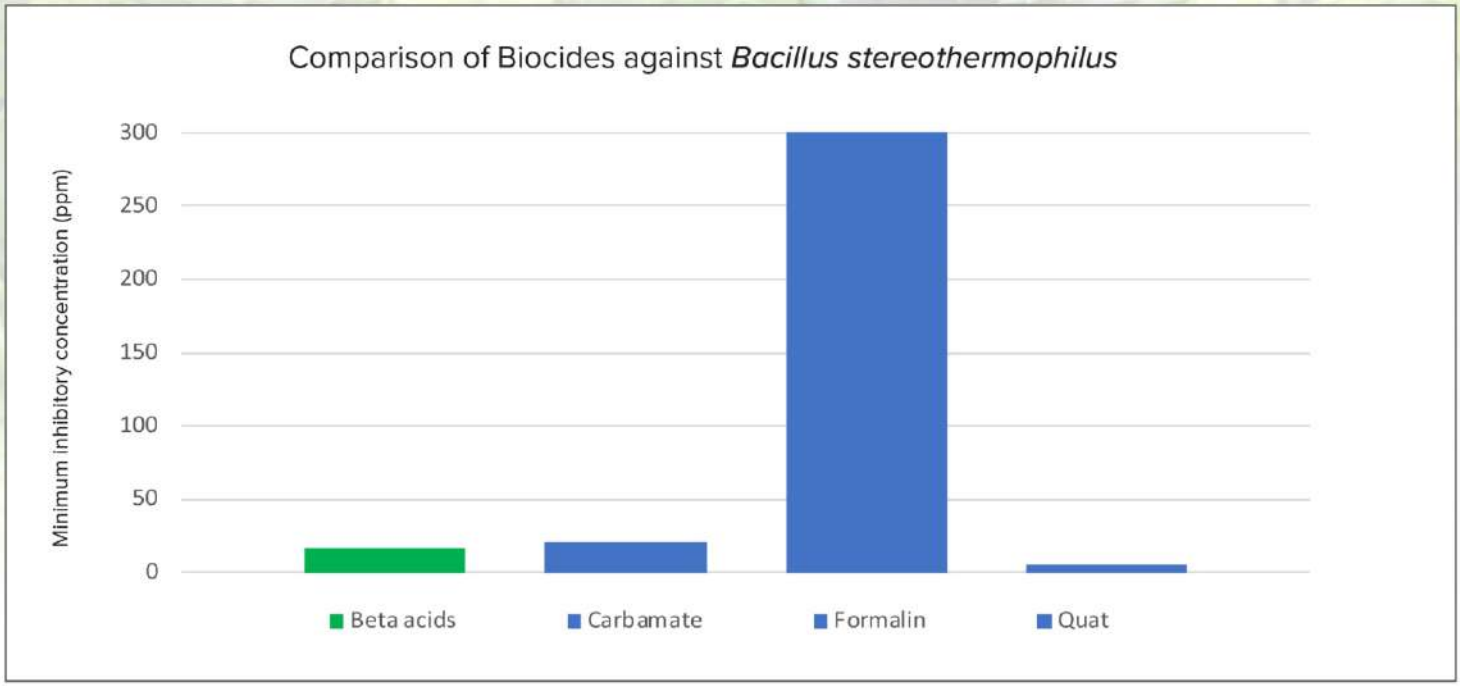
The hop product BetaStab® XL is a natural food processing aid. For more than 10 years it has proven effective at controlling bacteria in factories worldwide and is a cost effective alternative to synthetic biocides.

Our product can be applied during the production of sugar from either beet or cane. it is an aqueous solution of natural hop acids and is active over a wide range of temperatures and pH values.



Key advantages of BetaStab® XL

- **Active against bacterial contamination at ppm levels. Immediately stops bacterial growth**
- **Control of lactic acid, dextran and nitrite production**
- **Effective over a range of pH values and temperatures**
- **Demonstrated activity in sugar cane mills and sugar beet factories worldwide**
- **Cost effective alternative to synthetic biocides**
- **Can be used in thick juice storage, prolonging storage times**
- **Products are water based for ease of dosing**
- **Safe to handle and non-corrosive to equipment**
- **Coproducts suitable for animal feed**
- **Residues are beneficial for yeast and ethanol fermentation processes**



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BetaTec® hop products

"Transforming your world with our natural hop solutions"

BARTH-HAAS GROUP
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PHA® Classics

PHA® Classics in propylene glycol (PG

General:

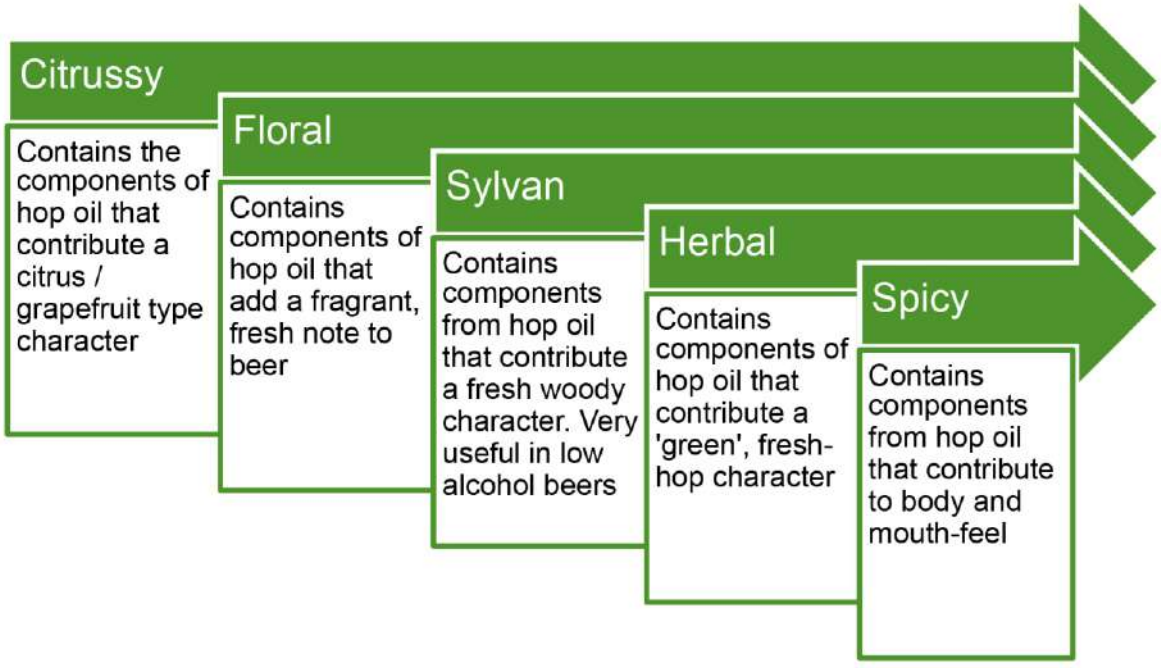
PHA® Classic products are prepared from cone hops by specific extraction and distillation methods. They consist of original hop oil compounds in a propylene glycol (PG) solution. PG is a permitted carrier for flavours as per regulation 2006/52/EC. PHA® products are exclusively supplied worldwide by the Barth-Haas Group.

Figure 1: Range of PHA® products

Characteristics:

PHA® Classic products are 100% soluble in beer (or other beverages). In general, PHA® products offer an alternative means of adding hop aroma independent of any other product or process and of annual crop variations. They can complement traditional means of adding hop aroma by kettle addition. Specifically, PHA® Classic products can impart beer flavour attributes such as citrussy, floral, herbal or spicy characteristics. They enhance pleasant existing flavours in the beer/soft drink and can mask some off-flavours. The following Classic PHA® products are available:

Classic PHA® :



Product specifications: Available on request.

Product Use:

The PHA® Classic products are completely soluble in beer and are intended for addition to fined or filtered beers. The required amount of PHA® may be metered directly into the beer stream during transfer to bright beer tank or other appropriate vessel. A usage rate of PHA® per hectoliter normally is about 10 ml but might vary between 5 – 40 ml according to the desired intensity of aroma. We recommend laboratory scale trials to determine which concentration gives the desired effect. This evaluation can be carried out on bottles of 250 to 500 ml capacity.

On a large scale, PHA® Classic products are used as a post fermentation addition to finished beer, where 100% utilization is feasible. PHA® Classic products are lightstable and therefore can be used to introduce hop aroma into a beer brewed using exclusively downstream products such as Tetrahop Gold® and Redihop®. These products may be added without prior dilution to beer either before or after the final filtration preferably by metered injection into a turbulent beer stream during transfer. They can also be added to bright beer without any increase in haze or deterioration in foam stability. If possible the pump should be adjusted to deliver the PHA® over approx. 95% of the total transfer time.

Trial Guide:

We recommend benchtop trials to determine which concentration gives the desired effect. To get a better initial understanding for the effect of individual PHA® products and the required dose rate, we recommend dosing directly into a glass of beer. For more accurate results, we suggest following this up with dosing into bottles as explained below. The rate for initial tasting trials should be approximately 10 mL/hL of the PHA® as supplied. PHA® products can be dosed directly using a micropipette or syringe. For example, a 330 mL bottle, a 33µL amount of PHA® gives a dose rate equivalent to 10mL/hL. Chill the beer to normal drinking temperature. Open and introduce the required volume of PHA® in the headspace of the beer bottle and reclose the bottle. Invert the bottle several times to ensure mixing and chill again for at least two hours before opening and tasting.

Special properties of PHA®:

The PHA® products have the following properties:

- Natural: 100% derived from hops by physical processes.
- Fully soluble: utilisation is 100% because of full solubility in beverages.
- No negative impact on beer quality: Do not increase beer haze or reduce beer foam stability.
- Easy handling: Provided as standardised solution for direct dosing.
- Light stability: free of hop α-acids; can be used with any packaging type.
- Ideal for brand diversification: differentiate existing products or create new ones.

Packaging:

The standard package size of PHA® is 1 and 5 l aluminium flask. Larger package units are available on request.

Storage and shelf life:

PHA® products are stable in unopened containers for at least 24 months. Store at

0-20 °C (32-68 °F) in high-grade stainless steel, glass, aluminum or lacquered steel drums.

Safety:

Please refer to our SDS which can be downloaded on our website.

Technical Support:

We will be pleased to offer help and advice on the use of PHA® in brewing/soft drink production.

E-mail: info@BarthHaasGroup.com www.BarthHaasGroup.com

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PHA® Varietals

PHA® Varietals in propylene glycol (PG)

General:

PHA® Varietals are prepared from cone hops by specific extraction and distillation methods. They consist of original hop oil compounds in an aqueous propylene glycol (PG) solution. PG is a permitted carrier for flavours as per regulation 2006/52/EC. PHA® products are exclusively supplied worldwide by the Barth-Haas Group.

Figure 1: PHA® Varietal

Characteristics:

PHA® Varietals are 100% soluble in beer (or other beverages). In general, PHA® products offer an alternative means of adding hop aroma independent of any other product or process. Specifically, PHA® Varietals give a subtle 'late hop' aroma to beer that is characteristic of the specific variety from which it is prepared. They enhance pleasant existing flavors in the beer/soft drink and can mask some off-flavors. The following PHA® Varietals are available:

PHA® Varietals:

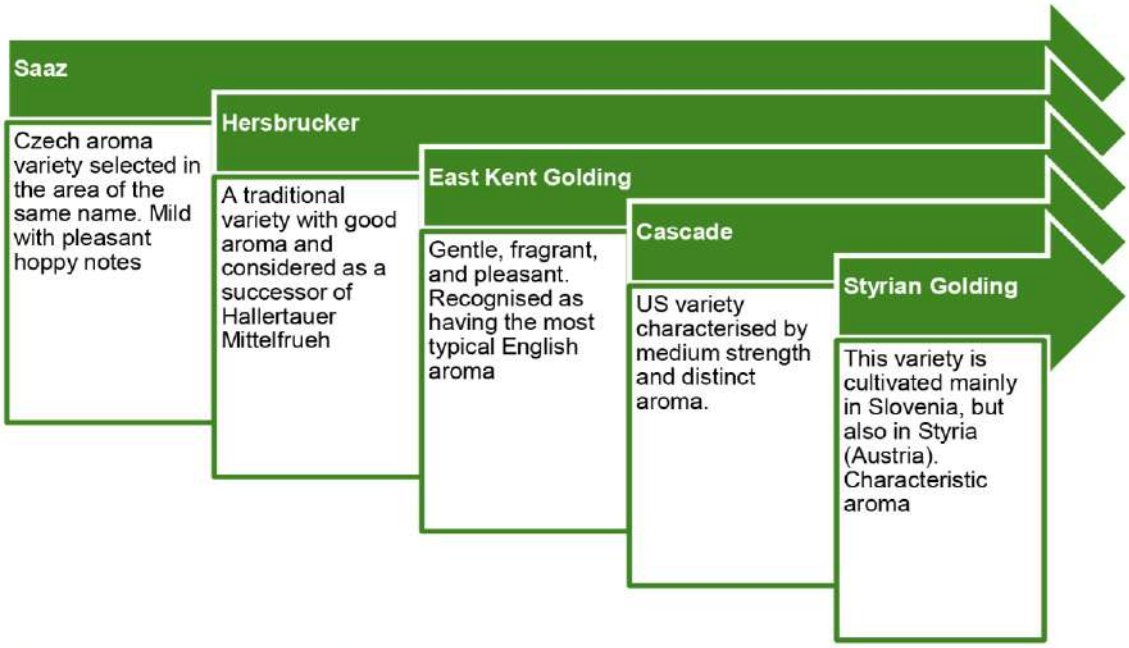

Figure 2: Examples from the PHA® varietal range

Custom made Products:

Custom-made PHA® Varietals from other varieties are available on request.

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Product specifications:

Description:	water white solution, can be hazy
Specific Gravity (20oC):	1.034 - 1.037
Flash point:	> 90 °C (194 °F)

Product Use:

PHA® products are completely soluble in beer and are intended for addition to fined or filtered beers. The required amount of PHA® may be metered directly into the beer stream during transfer to bright beer tank or other appropriate vessel. A usage rate of PHA® per hectoliter normally is about 10 ml but might vary between 5 – 40 ml according to the desired intensity of aroma. We recommend laboratory scale trials to determine which concentration gives the desired effect. This evaluation can be carried out on bottles of 250 to 500 ml capacity.

On a large scale, PHA® Varietal products are used as a post fermentation addition to finished beer, where 100% utilization is feasible. PHA® Varietal products are lightstable and therefore can be used to introduce hop aroma into a beer brewed using exclusively downstream products such as Tetrahop Gold® and Redihop®. These products may be added without prior dilution to beer either before or after the final filtration preferably by metered injection into a turbulent beer stream during transfer. They can also be added to bright beer without any increase in haze or deterioration in foam stability. If possible the pump should be adjusted to deliver the PHA® over approx. 95% of the total transfer time.

Trial Guide:

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We will be pleased to offer help and advice on the use of PHA® in brewing/soft drink production.

QUALITY CONTROL IN BREWING

BIJAY BAHADUR

B.Sc. (Hons.); B.Tech. (Gold Medallist); PGDEE; FIE; Chartered Engineer (India) PE (ECI); LMIIChE; LMAFST (I)

Introduction

Quality control is the total collection of all means and activities by which standardized properties of a designed product are precisely and consistently maintained throughout production, marketing, and consumer use.

The objectives of quality control are to ensure the uninterrupted integrity of product and process, to avoid quality jeopardy, and to avoid recourse to "corrective action".

Consumer acceptance, based on quality, depends on the following:

1. Recognition and interpretation of the preferences existing in a large population.
2. The recognition and application of the concept that consumer preferences are paramount to product design.
3. A product that accurately incorporates consumer preferences.
4. A production-quality control regime that strives for uncompromising excellence in producing the designed product.
5. Consistent conformance to the total product design and good manufacturing practices (GMP) from conception through final packaging.
6. A corporate image of excellence earned through the continuous and consistent distribution of quality products.

General Brewery Functions

Regardless of the brewery capacity, seven functions must be accommodated with respect to administrative and primary technical responsibilities are:

1. Production operations
2. Process control
3. Quality control
4. Quality assurance
5. Research and development
6. Procurement
7. Technical advisory committee

These functions are interrelated and, as a unit, are bound to all phases of production and distribution.

A. Production Operations

Quality of product and process begins with the production operators; their performance primarily determines the excellence of a quality program. Production operations responsibilities are:

- Assessment of performance
- Conformance to specifications
- Guidance
- Documentation
- Institution of corrective action

The principal positive quality action is operator performance. To be successful, the brewer must place the highest emphasis of quality control on the training and performance of the operator and the equipment.

B. Process Control

Process control is an "on-line" quality control tool operating in line function with production. A program of routine technical surveillance is included in the assignments of the group. Close technical liaison between this group and quality control provides analytical procedures, reagents, instrumentation, counsel, and an extension of services to production. An added responsibility of this group to production personnel is that of "on-site" technical interpretation of observations and analytical results.

C. Quality Control

The quality control department is the central technical group responsible for management of the quality program. All specifications for materials, processes, and the product itself must be established by this group. Quality control has the responsibility to know, at all times, the quality profile of the materials, processes, and products; it must honestly, clearly, and promptly convey this information to the head of the brewery.

In summary, quality control is neither a fault-finder nor "witch hunter"; it is the navigator to product excellence.

D. Quality Assurance

The quality assurance department is the quality conscience of the brewery. It is the source of all materials, process and production specifications, guidelines, process procedures, audits and quality appraisals. It must work cooperatively in technical liaison with all the departments. It must also interface with regulatory agencies, materials and equipment suppliers, distributors, retailers and customers. Necessary laboratory and analytical services are provided by the quality control department or, in special cases, by consulting laboratories.

The more important services of the quality assurance department are collect, assemble, and keep current complete and accurate, detailed information on the following:

- Materials,
- Formulations,
- Process procedures,
- Process yields,
- Product Composition,
- Additional information such as description of the process and products

E. Research & Development

The role of research and development is to be cognizant of the state of the art and to extend proprietary intelligence to improved quality, operations, and effectiveness. Production and quality control represent strict and constant adherence to a rigidly defined system. Research and development, represents change and flexibility. Despite an extreme difference in philosophies, both functions are useful and should provide valuable services to each other.

The research and development division is to be administered separately from the production and quality control functions to an extent that insures their absolute protection from any research influences or duress in matters of their operations, decisions, or practices.

A. Procurement

The procurement department executes and controls all purchases made by the brewery; it ensures the value received and delivery of the goods all according to good business practices. The first requirement of a purchase is the identification and precise description of the commodity; this establishes the quality of the purchased items. It is critical that this level of quality be consistent with the level of the quality of the system to which it is applied. The procurement officer should be well-informed, intimate participant of the quality team. Procurement cannot be expected to meet its responsibilities without the counsel and full support of the quality control/quality assurance departments. However, acceptance of all process-related materials is solely the prerogative of quality control. The provision of high-quality brewing materials is the foundation for "building" quality into a product.

B. Technical Advisory Committee

A technical advisory committee counsels management on complex technical issues involving more than a single area of professional expertise. The team usually includes the heads of quality control, quality assurance, production, engineering, and research. The respective section-heads are included in the deliberations by specific request.

Product Definitions

No product can be manufactured without knowing an established identity and description. It follows that no quality beer can be manufactured without a design that includes its comprehensive description, definition, and specifications. The preparation of precise, detailed product descriptions and specifications for each product is a fundamental necessity before any production is to begin. If it is found that an operating brewery does not have such documents, they should be promptly prepared. It is only through precise knowledge of goals, direction, and guidelines that excellence of quality in a product can be attained.

The development of a new product or the redesign of an existing one begins with its description. Then follows, in preferred succession throughout the process:

- Formulation
- Process
- Process procedure
- Materials specifications
- Product specifications

This is tedious task but absolutely necessary for the foundation of a successful quality control program. This must be done honestly and realistically, describing exactly the degree of perfection to which the management commits itself.

Quality Control in the Brewery

For quality control of beer, the quantitative determinations of the following's parameters are essential.

1. *Wort production*
   Process quality control parameters for wort production should be: extract, color, bitterness (BU), pH and dissolved oxygen.

2. *Pitching*
   Process quality control parameters for pitching yeast should be: cell count, dead cell and yeast pitching rate. (Wort bacteria, wild yeast and lactic acid bacterial infection may be applied)

3. *Fermentation*
   Process quality control parameters for beer fermentation should be: Apparent extract (0plato), temperature, top pressure, cell count, dead cell, growth rate, pH, VDK (diacetyl) and flavor control (wort bacteria, wild yeast and lactic acid bacterial infection may be applied).

4. *Maturation*
   Process quality control parameters for beer maturation should be: temperature, top pressure, original extract (0plato), alcohol, apparent extract, bitterness, pH, VDK and Flavour control (Wild yeast and lactic acid bacterial infection may be applied).

5. *Stabilization*
   Process quality control parameters for beer stabilization should be: CO_2 content, temperature, top pressure, dissolved oxygen, polyphenols content, anthocyanogen contents, colloidal stability (Wild yeast and lactic acid bacterial infection may be applied).

6. *Filtration*
   Process quality control parameters for filtration should be: turbidity (haze), dissolved oxygen, CO_2 content, original extract or alcohol. (Wild yeast and lactic acid bacterial infection may be applied).

7. *Bright Beer handling*
   Process quality control parameters for bright beer should be: Original extract, alcohol, apparent and real extract, real degree of fermentation (RDF), pH, color, turbidity (haze), CO2 content, dissolved oxygen, SO2 content, head retention (foam stability), bitterness, VDK and flavour control (Wild yeast and lactic acid bacterial infection may be applied).

8. *Packaging*
   Process quality control parameters for packaging should be: CO_2, total oxygen content and air in headspace.

Microbiological Quality Assurance and Quality Control

The brewery microbiologist should be clearly involved in the entire beer production operation. Followings are the key areas of consideration:

- Inspection of incoming raw materials including water.
- Examination of brewing equipment and the brewing environment.
- Microbiological surveillance over product at all stages.
- Evaluation of cleaning materials and cleaning/sterilizing procedures
- Training of laboratory staff and liaison with brewing, engineering, and management members.

Quality control (QC) and quality assurance (QA) in the context of brewing distinguish the act of determining the current or very recent microbiological status of the plant and products (QC) from the actions that are put into place to ensure a quality standard (QA). The results of QC are used to provide QA; for example, dirty surfaces in fermenters must be cleaned or poor viability yeast discarded. It is important that the process is not entirely reactive; however, a proactive approach should be adopted to prevent faults occurring. There are essentially two approaches to microbiological testing, the traditional methods that rely on cultivation of yeasts and bacteria in appropriate media followed by identification of the offending organism, if necessary, and modern rapid approaches that have a minimal reliance on prior cultivation. The move toward rapid methods for microbial detection and identification has been driven by technological developments and also by changes in the industry. Some key motivating factors are:

- Growing market volumes for non-pasteurized beer in cans and bottles
- More low- and nonalcoholic beers
- Increasing variety of flavored sweetened alcopop-type beverages
- Tightened government regulations

Minimizing the time needed to detect a spoilage agent can lead to significant savings through reduced product recalls, extension of shelf life, and consistency of product quality and flavor.
The decision to adopt traditional or rapid methods is to an extent dependent on the critical control point (CCP) under review. For example, processes in the brewhouse, fermenting hall, and storage cellar generally require at least 5 days and so traditional methods are appropriate to provide the green light for the next step. However, other stages such as filtration, bright beer cellar tanks, clean-in-place (CIP), and water services are more constrained by time and rapid tests can provide the necessary information for optimization of the process.

Setting Microbiological Standards and Sampling

Hazard analysis of critical control points (HACCP) has become an essential feature of QC in the food and drink industries including brewing. This involves the systematic assessment of all the steps involved in the brewing process and identification of those steps essential to the hygienic quality of the product. In a large complicated plant, it will be advisable to reduce the operations to a series of connected subroutines.

Many of the CCPs are not microbiological; the principal microbiological CCPs are shown in Figure 1. At these stages it is essential to monitor for microbiological hazards using either traditional or rapid methods. First, it is necessary to set microbiological standards for each point. What is the maximum allowable level of contamination and by what organisms? Some suggested levels of sensitivity for detection are given in Table 13.1, but these are guidance only and it is important to establishing own definitive criteria. For example, it may be permissible to use pitching yeast with limited bacterial contamination by O. proteus, but yeast contaminated with Pediococcus should be discarded and the source of contamination determined. Some organizations adopt a “green, amber, red” approach in which green flags adherence to microbiological standards (no action needed), amber indicates minor microbiological concern, the brewing process can continue but some microbiological contamination has occurred, and should be investigated, and, finally, red indicates failure to meet a microbiological standard and production staff must be informed so that corrective action can be taken.

It is valuable to prepare trend graphs showing the microbiological status over time for the various stages and products. A trend showing a gradually worsening microbiological situation can give early warning of a problem.

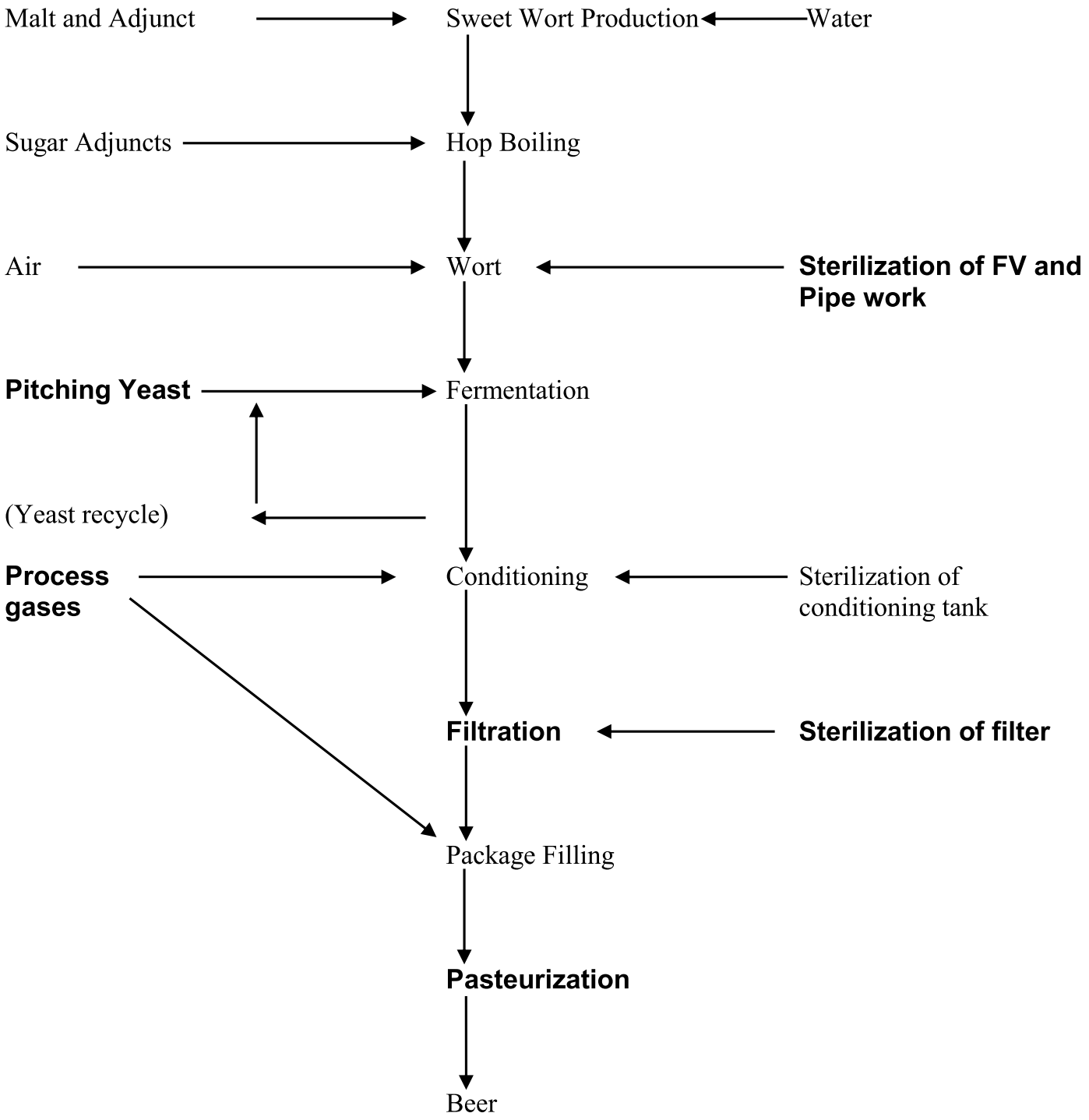

Figure 1: Flow diagram of beer production showing critical control points (CCPs) for microbiological testing in bold.

Sampling at the CCPs requires careful consideration so that the results of the microbiological tests are statistically sufficient. Typical samples are liquids; for example, samples of final water rinses from CIP operations or water rinses of containers. Such samples should be of sufficient scope to provide for assurance that the microbiological standard has been achieved. For example, when examining beer, a sufficient quantity should be filtered or forced to allow for detection of contaminants at the required level, usually 100 to 1000 ml for testing of packaged beer depending on the size of the container and the sensitivity required (Table 1).

Table 1: Suggested Sensitivity Required for Detection of Specific Spoilage Organisms in Brewery Samples

Samples	Sensitivity
Cold aerated wort	1 organism per 25 ml
Pitching yeast	1 bacterium per ml and 1 wild yeast per 10^6 culture yeast
Fermenting wort	1 organism per ml
Tank bottoms	1 organism per ml
Beer in storage	1 organism per ml
Filtered beer	1 beer spoilage organism per 100 ml or 10 to 10^2 non-beer spoilage organisms per 100 ml
Packaged beer (non-pasteurized or Pasteurized	10 to 10^2 non-beer spoilage organisms per 100 ml
Rinse water (end of cleaning-in-place)	1 organism per 100 ml

Hazard Analysis Critical Control Point (HACCP)

Brewers have addressed these requirements primarily through the application of Hazard Analysis Critical Control Point (HACCP) methods. The key elements of a HACCP system can be listed as follows:

1. Analysis of the potential hazards in beer business operation.
2. Identification of the points in those operations where hazards may occur.
3. Decisions as to which points are critical to ensure beer safety (critical points).
4. Identification and implementation of effective control and monitoring procedures at the critical points.
5. Review of the analysis of beer hazards, the critical points, and the control and monitoring procedures, periodically and whenever the business operations change.

In HACCP terms, hazards are defined as any microbiological, physical, or chemical contaminant which may potentially gain access to the finished beer and cause harm to the consumer. Although hazards clearly relate to safety, in the brewing context any failure to ensure safety is also a failure in a QMS. When carrying out a HACCP program, the principles of HACCP are implemented review of the application of HACCP in brewing is beyond the scope of this chapter, but several key points are worth emphasizing:

1. Prepare a Flow Diagram. The purpose of the flow diagram is to provide a detailed description of the process to help the HACCP team carry out the hazard analysis. The flow diagram is essential to the HACCP team when identifying hazards in the process. The flow diagram should be an activities diagram, showing each process step in the order in which it is carried out, including rework routes. All material additions and services should be shown in the diagram.

2. Identify the CCPs. A critical control point is a step or procedure in the brewing process where control is essential to prevent, eliminate, or reduce a hazard to an acceptable level. The World Health Organization (WHO) recommends that CCPs should be determined using the HACCP decision tree.

Usually, it has been applied where processes present hazards to health from either physical or chemical agents. Microbiology has not usually been included except where there might be a health risk from pathogenic organisms. It is beginning to be used as a method of microbiological quality assurance where the risk is limited to product wholesomeness.

There are several elements to HACCP analysis. The starting point is to draw up a detailed flow diagram of the process under consideration. Once constructed, the process flow diagram must be verified to ensure that all relevant steps have been included. All HACCP analyses contain seven parts (Fig. 2).

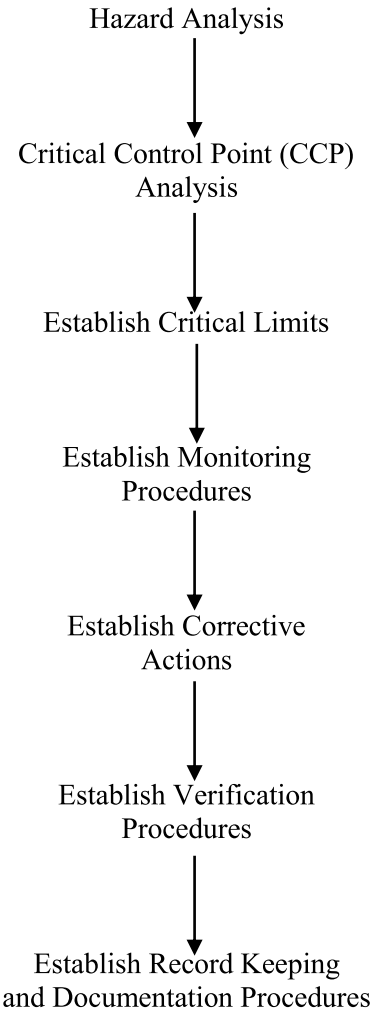

Fig. 2: Elements of HACCP Analysis.

- In the first part each step in the process is assessed and its inherent risks are identified.
- In the second step the identified risks are graded to identify those that are critical control points (CCPs). A CCP is a process step which, if not under proper control, has the potential to cause injury or illness to consumers. For microbiological control of the brewing process the concept of the CCP is widened to include a potential to result in the sale of product that is not wholesome.
- The third part of the analysis is to set critical limits for each CCP. For example, in the case of a pasteurized beer, the critical limits would be the time and temperatures needed to ensure that the product is rendered microbiologically stable.
- The fourth step is to establish monitoring procedures to ensure that the critical limits are adhered to and the CCP is in control. In the case of the pasteurized product this would be a permanent record of the times and temperatures to which all batches of product had been exposed.

- The fifth part of the analysis establishes corrective actions should a CCP be found to be out of control. To continue the example of the pasteurized product, this would include procedures to segregate product, which it was suspected might not have received the specified heat treatment. The procedures to be followed in these circumstances must be detailed in the HACCP plan. They must happen and not be subject to discussion. In the example cited the first priority would be ensure that suspect product could not be sent to trade. The absolute requirement for reliable systems of traceability and labelling can be readily appreciated. Once suspect product has been isolated a more leisurely examination of the problem and consideration of its fate can be undertaken.

The penultimate step in the HACCP plan is to establish verification procedures. These are of several types and their precise nature depends upon the detail of the process. They must include two elements.

1. A day-to-day examination of the product to ensure that it meets pre-established specifications.
2. Regular and preferably independent audits must be performed to guarantee the integrity of the process. Finally, the entire HACCP plan must be documented and a system of record keeping set up.

Analyses in Daily Quality Control

Criteria for the decision to carry out the analysis in-house or by an external lab are:

- The necessity of the analysis (legislation, demands from the retailers, quality).
- The time span in which the results have to be available.
- Availability of in-line measurements.
- One's own laboratory capacity and qualification.

When using in-line measurements, it has to be kept in mind that the availability of qualified personnel and of a reference measuring system in the lab is absolutely essential. Therefore, in-line measurements may help the laboratory in its daily work, but will never be able to substitute it as a whole.

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Understanding stoichiometric equation of reaction between malt phosphate and calcium ion and estimating drop in mash ph.

SAURABH N. PERKAR

BREWER
ALCHEMY MICROBREWERY, BANGALORE

As a brewer we knows that addition of salts such as calcium chloride helps us to drop mash ph. We have been using different equations to estimate change in ph.

But do we know how much exact calcium ion concentration we should contribute using stoichiometry. This time we will consider phosphate ion concentration for mash ph balance.

As we know phosphate concentration is 1 % weight basis per kg of malt. But to use it in stoichiometric equation we need to convert it into ppm.

Lets have an example,
Phosphate ion concentration is 3333.8 ppm and our water have calcium ion concentration of 4 ppm and we supplemented 1.19 gm per liter of calcium chloride dihydrate to raise calcium concentration to 327 ppm.

Now before and after calcium addition R.A. of water were 0.383 meq/l and -3.846 meq/l.

Now we need to calculate how much tricalcium phosphate will be produce.

The balanced chemical equation for the reaction between calcium ion and phosphate ions to form tricalcium phosphate is 3ca^2+ + 2 po4^3- = ca3(po4)2

Using this concentration calculated ion product of calcium and phosphate are 3.87* 10^-17 since this value is less than ksp of tricalcium phosphate which is 1.0*10^-26. So calculated ksp by equilibrium for tricalcium phosphate is 1.89 * 10^-9 ppm

Now we know that once tricalcium phosphate is produced it releases 6 moles of hydrogen ion which lowers ph mash.

So calculated hydrogen ion concentration will be 1.13*10^-8 ppm.

So as our initial residual alkalinity was 0.383 so released hydrogen ion concentration will reduce R.A. by 2.29 *10^-9 meq/l

As distilled water mashph was 5.8 and after calculating using following Ph= pKa + log(HCO3-/H+)
Our final mash ph was 5.54

So now we know how stoichiometry can help us not only to estimate change in ph can help us to understand if any calcium ions are left into water. In this case all calcium ions were consumed into reaction

CHOOSING BEERS BY SEASON

ANUP

SENIOR BREWER
AT CINNAMON KITCHEN MICROBREWERY

Craft brewing in the India is growing at a rapid pace. However, since the rise of the craft beer movement, beer drinkers have become more adventurous. Now when they shop, they're more interested in finding something new, rather than more of the same. This is great news for those of us who want options when we drink. Craft beer connoisseurs choose according to a wide variety of factors, from complex flavor profiles to alcohol content.

What Makes Beer Seasonal?
Spring Beer Styles
Summer Beer Styles
Autumn Beer Styles
Winter Beer Styles

What makes a beer Seasonal?

A seasonal beer could be based on the structure of the beer itself. For instance, summer beers are light and refreshing, winter beers are dark and complex, while fall and spring beers are somewhere in between.
Seasonal beers will often incorporate holiday-specific flavors or be designed to pair well with seasonal foods. Most seasonal brews are driven by seasonal ingredients, reflecting the changing and growing seasons by incorporating ingredients that typically become available during different times of the year.

Spring Beer Styles

dark winter have ended and even though much of the springtime is still chilly, most spring beer drinkers are eager to start thinking about sunshine and the outdoors. The perfect beers for the season follow suit.

- **Dry** — While winter beers are sweet and heavy, spring beers are the opposite. Although they aren't as light as summer beers, they tend to be drier. This means more of the sugars have been fermented. The beer will be crisper and less cloying than typical winter styles.

- **Saison** — Saison are a Belgian style of beer fermented with wild yeast. They are often referred to as "funky" because of the complex fruity and spicy flavor of the yeasts involved. Typically lower in alcohol, but modern productions of the style have moderate to high levels of alcohol. Along with several other varieties, it is generally classified as a farmhouse ale.

- **Common Lager** — American and German style this is made using lager yeast, which typically ferments at colder temperatures. However, unlike most lagers, common beers are fermented at the typical warmer ale temperature. The result is a wonderful hybrid of both styles. Known to be eminently drinkable.

- **Fresh Hops** — Spring is the start of the new hop season. As such, many breweries use this as an opportunity to start using some fresh hops in their brews. Usually much lighter than the resiny hops used in the autumn and winter, they make for a crisp and delightfully bitter beer. Plus, this is a great time to taste test different beers that boast heavy use of particular hop varietals, which can be surprisingly diverse in flavor.

- **Bocks** — Darker German bock beers are a great option in the spring. They're not nearly as dark as stouts and porters, but they aren't pale ales either. They are malty and sweet, but not too much for your taste buds to handle.

Summer Beer Styles

Summer conjures up images warm weather, and long days. The preferred beers of summer reflect this mood. They are light and drinkable, perfect for cooling off after a hard day's work. Let's take a look at some of the best flavors summer beers have to offer.

- **Fruit** — Summer is a great time for fruit beers, especially ones that are light, crisp beers. Fruit is refreshing and sweet, making it go down easy. Fruit beers resulting in an easy-to-drink brew that is typically low in alcohol. Many brewers are also experimenting with different fruits other than lemons.

- **Wheat** — Wheat beer and fruit go hand in hand. Wheat beers, such as Belgian wits and hefeweizens, have a hazy spiciness that is full of flavor, but never heavy. Plus, they are often served with a slice of citrus, adding another refreshing taste.

- **Pale and Hoppy** — If you're a hop head, you'll want to make sure you choose a hoppy beer that is also pale with a light malt body. Pale ales and their hoppier cousins, India Pale Ales (IPAs), come in several varieties and some of them are the perfect pairing for summer. Luckily, as more breweries are trying to cater their special releases to specific seasons, they are making sure to include summer pale ales when the warmer months roll around.

- **Classic Pilsner** — In many ways, the classic pilsner beers are great in the summer. They're light, not overly hoppy, and very refreshing. If you're an adventurous beer drinker, don't let the term "pilsner" turn you off. There is a wide variety of fun pilsners out there that experiment with the classic flavor profile of this Czech style.

- **Hazy IPA** — If you're a beer lover, by now you have surely heard and also tasted a **delicious Hazy IPA**. If not, they're also known as New England Style Indian Pale Ales or juicy IPAs. Hazy IPAs are the perfect beverage to sip on while in the sun because they are packed with fruit and citrus flavors, are smooth to the taste, and are soft-bodied. The beer appears to be hazy because it is made with wheat or oats. No bitterness with these refreshing IPA's, just a sweet treat that will not be difficult to get down!

- The low IBU is a simple and quick way to tell whether the IPA you are seeing on the menu is Hazy IPA or not. The "Haze Craze" is real! Customers cannot get enough of them, and this unique type of IPA **tends to sell 2-3 times more than a traditional IPA**. So, if you are trying to keep up-to-date on new consumer trends, this is the way to go! The bright orangey-yellow coloring of the beer will fit perfectly into the aesthetic of a nice summer day, and your customers will absolutely love this option on tap.

- **Sour** — The best way to describe a sour, refreshing! Sour beer has a puckery, acidic, and tart taste with a champagne-like fizz. This style is found in several different beer categories like Berliner Weisse and Flanders Red Ales. Just because they hold the name sour does not mean that some aren't fruity and light to the taste.

Autumn Beer Styles

Things start to cool down come autumn. Fittingly, the beers of the season are less concerned with being refreshing — many will start to play with a heavier body and more autumnal spiciness. In fact, in many ways, autumn beers were the first seasonal beers to gain popularity.

- **Pumpkin** — It should come as no surprise that pumpkin, the most autumn-inspired ingredient, dominates the seasonal beer scene every fall. Pumpkin beers allude to their pastry counterparts, often featuring large amounts of nutmeg, allspice, and cinnamon. Pumpkin also creates a heavier body, giving these beers a more dessert-like feel. In fact, these seasonal beers are so popular, they are starting to be released earlier and earlier every fall.

- **Maple** — More recently, maple has become a popular flavor addition in fall beers. The syrupy flavor pairs well with brown ales, making them less heavy than pumpkin beers. The lightness of these beers makes them perfect to drink before or after dinner.

- **Amber** — Amber beers, whether ales or lagers, are slightly darker than pale beers. This slightly heavier maltiness is perfect for the fall, Supremely drinkable, amber beer comes in a lot of different varieties, making it easier to cater to your palate.

- **Belgian** — Belgium is famed for its Trappist beers, which can only be legally made by Trappist monks. These beers have long been hailed as the best in the world. They tend to be spicy and boozy. If you want to spend some time sipping on one beer and really explore its flavor profile, Trappist ales are perfect come autumn.

- **Oktoberfest** — Autumn is also the time when Germany's famed Oktoberfest, probably the greatest holiday dedicated to beer in the world, is celebrated. So, it only makes sense that many breweries offer their own Oktoberfest beer. Oktoberfest beers are typically heavier brews that are well-aged with a deep amber color.

Winter Beer Styles

- **Stouts** — These dark, bitter, and roasty flavored beers will leave you with a warm fullness that is perfect for hibernation. What sets stouts apart are their taste and color. They are black and taste like coffee, licorice, and chocolate. A stout should be full and creamy to the taste, making it the perfect beer to sip on on a cold night.

- **Porters** — A porter is a deep brown, reddish color with a creamy head. It has a roasty chocolate flavor and is slightly bitter. As one of the heaviest beer styles, it is best to drink in the colder months when you need something to warm your insides.

- **Bourbon** — Another popular technique for winter brewers is barrel aging. This involves letting the beer age in a used liquor barrel for months at a time. As a result, the oaky flavor of the liquor is imparted upon the beer. This technique works best on heavy, high-alcohol beers, so they are especially well-suited for the colder months.

- **Chocolate and Coffee** — Stouts and porters already have subtle coffee and chocolate notes. Many brewers play on these subtle flavors by actually adding chocolate and coffee to their brews. These heavy, dark flavors are perfect for the kind of dessert beers that scream winter.

- **Eggnog** — This is a recent develop Beer style ,The creamy, spicy flavors of eggnog lend themselves well to heavy, dark beers. These aren't the kinds of beers you'll want to drink too fast and in large quantities, but if you want a nice dessert beer, eggnog-inspired brews are definitely worth a try.

Source- www.pouremybeer.com

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From _____

IMPORTANCE OF COLLOIDAL SILICA AS A MAJOR INPUT FOR SOIL STRUCTURE IMPROVEMENT

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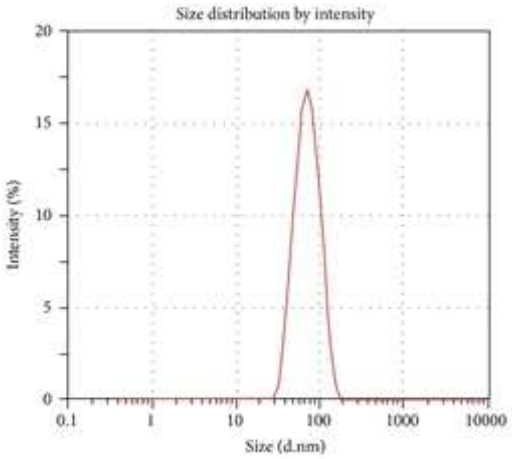
What is Colloidal Silica?

Colloidal silica is a suspension of submicron-sized particles of amorphous silica in water. These particles have a diameter ranging from 1 to 100 nanometers and are highly stable in solution due to the strong electrostatic forces between them. Colloidal silica can be naturally occurring, but it can also be synthesized using various methods, including acid hydrolysis, sol-gel, and precipitation methods.



GRAPH -1 Particle size distribution of 20 nm silica nanoparticles

Properties of Colloidal Silica

Colloidal silica particles possess unique physical and chemical properties that make them highly useful in a variety of applications. Some of the key properties of colloidal silica are:

1. High Surface Area: Colloidal silica particles possess a high surface area to volume ratio, providing numerous active sites for chemical reactions. This high surface area enables the particles to adsorb other molecules and ions, leading to the formation of complex structures and interactions with other substances.

2. Stability: Colloidal silica particles are highly stable and do not settle out of suspension easily. This property enables the uniform distribution of colloidal silica in different environments, leading to its efficient utilization in various applications.

3. Reactivity: Colloidal silica particles are highly reactive and can participate in numerous chemical reactions, including cation exchange, adsorption, and complexation with organic molecules. This reactivity is due to the presence of surface hydroxyl groups on the silica particles, which can interact with other molecules and ions.

Structure of Colloidal Silica

Colloidal silica consists of submicron-sized particles of amorphous silica suspended in water. These particles have a diameter ranging from 1 to 100 nanometers and possess a unique structure that differs from that of crystalline silica. Unlike crystalline silica, which has a well-defined three-dimensional structure, amorphous silica lacks long-range order and possesses a disordered network of silicon and oxygen atoms.

The structure of colloidal silica particles is influenced by several factors, including pH, temperature, and the presence of other ions. At low pH, colloidal silica particles tend to be positively charged, while at high pH, they become negatively charged. This charge is due to the presence of surface hydroxyl groups on the silica particles, which can become protonated or deprotonated depending on the pH of the surrounding environment.

Behavior of Colloidal Silica in Different Environments

The behavior of colloidal silica in different environments is influenced by several factors, including pH, temperature, and the presence of other ions. Here are some examples of how colloidal silica behaves in different environments:

1. Acidic Environments: In acidic environments, colloidal silica particles tend to be positively charged due to the protonation of surface hydroxyl groups. This positive charge enables the particles to adsorb negatively charged ions and molecules, leading to the formation of stable complexes. However, at very low pH, the particles may agglomerate and settle out of suspension.

2. Alkaline Environments: In alkaline environments, colloidal silica particles tend to be negatively charged due to the deprotonation of surface hydroxyl groups. This negative charge enables the particles to repel other negatively charged ions and molecules, leading to the formation of stable suspensions. However, at very high pH, the particles may become unstable and agglomerate.

3. Presence of Other Ions: The behavior of colloidal silica in the presence of other ions depends on the nature and concentration of the ions. For example, the presence of divalent cations such as calcium and magnesium can lead to the formation of stable colloidal silica aggregates due to the bridging effect of the ions. In contrast, the presence of monovalent ions such as sodium and potassium can destabilize colloidal silica particles by screening the surface charges.

Benefits of Colloidal Silica for Agriculture Soil

Colloidal silica is an important component of soil organic matter and plays a critical role in maintaining soil structure and fertility. It has several benefits for agriculture soil, including:

1. Improves Soil Structure: Soil structure is the arrangement of soil particles into aggregates, which influences the movement of water, air, and nutrients in soil. Colloidal silica can help to improve soil structure by promoting the formation of stable aggregates and reducing soil compaction. The presence of colloidal silica also enhances the soil's water-holding capacity, thereby reducing water stress on plants.

2. Increases Nutrient Availability: Colloidal silica is an excellent source of silicon, a micronutrient that is essential for the growth and development of many plant species. Silicon has been shown to enhance plant resistance to biotic and abiotic stresses, improve photosynthesis, and increase nutrient uptake. Colloidal silica can also bind with cations such as calcium, magnesium, and potassium, making them more available for plant uptake.

3. Promotes Plant Growth: Colloidal silica has been shown to enhance plant growth and development in many plant species. It can stimulate the production of plant growth regulators, increase the efficiency of photosynthesis, and improve root development. Colloidal silica can also improve the quality and yield of crops, making it an important tool for modern agriculture.

Practical Applications of Colloidal Silica in Agriculture Soil

Colloidal silica has numerous practical applications in agriculture soil. Here are some of the ways in which it is used:

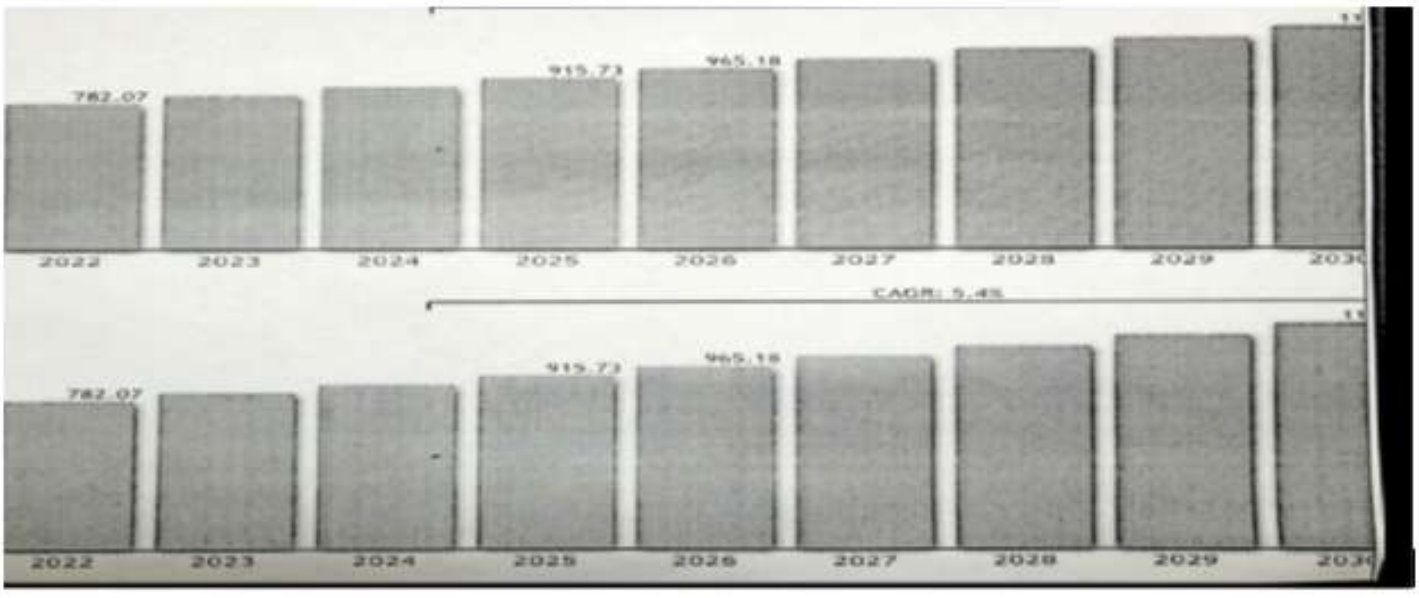
1. Soil Amendment: Colloidal silica can be added to soil as a soil amendment to improve soil structure and fertility. It can be applied directly to soil or mixed with compost or other organic matter before application. The recommended application rate for colloidal silica is typically 1 to 2 kg/ha.

2. Foliar Spray: Colloidal silica can be applied to plant leaves as a foliar spray to enhance plant growth and development. It can be sprayed directly onto the leaves or mixed with other nutrients such as nitrogen, phosphorus, and potassium. The recommended concentration of colloidal silica for foliar spray is typically 1 to 2% of the total spray volume.

3. Hydroponics: Colloidal silica can be used in hydroponic systems to improve plant growth and nutrient uptake. It can be added to the nutrient solution or used as a substrate for plant roots. Colloidal silica is particularly useful in hydrophone.

Colloidal Silica Market - Global Industry Assessment & Forecast

Colloidal Silica Market Size USD 1191.16 Million by 2030



Conclusion:

In conclusion, colloidal silica is a unique substance with fascinating chemistry that makes it highly useful in a wide range of applications. Its unique structure, properties, and behavior in different environments enable it to participate in numerous chemical reactions, including adsorption, complexation, and cation exchange. Its high surface area to volume ratio and stability make it highly suitable for applications in coatings, adhesives, and other industries. Additionally, its reactivity and ability to form stable suspensions make it highly valuable for agricultural applications, where it can improve soil structure, water retention, and nutrient uptake. Overall, colloidal silica is a versatile substance with numerous applications that will continue to be explored and utilized in various industries in the future.

RUPAK KUMAR CHATTERJEE

Yamuna Nagar (Haryana)

Modified Starch

Modified starch, also called starch derivatives, are prepared by physically, enzymatically, or chemically treating native starch to change its properties. Modified starches are used in practically all starch applications, such as in food products as a thickening agent, stabilizer or emulsifier; in pharmaceuticals as a disintegrant; or as binder in coated paper. They are also used in many other applications.

Starches are modified to enhance their performance in different applications. Starches may be modified to increase their stability against excessive heat, acid, shear, time, cooling, or freezing; to change their texture; to decrease or increase their viscosity; to lengthen or shorten gelatinization time; or to increase their visco-stability.

Modification Methods

Acid-treated starch also called thin boiling starch, is prepared by treating starch or starch granules with inorganic acids, e.g. hydrochloric acid breaking down the starch molecule and thus reducing the viscosity.

Other treatments producing modified starch are:

Dextrin roasted starch with hydrochloric acid.
Alkaline-modified starch with sodium hydroxide or potassium hydroxide bleached starch with hydrogen peroxide.
Oxidized starch with sodium hypochlorite, breaking down viscosity.
Enzyme-treated starch maltodextrin, cyclodextrin monostarch phosphate with phosphorous acid or the salts sodium phosphate, potassium phosphate, or sodium triphosphate to reduce retrogradation.
Distarch phosphate by esterification with for example sodium trimetaphosphate, crosslinked starch modifying the rheology, the texture acetylated starch esterification with acetic anhydride.
Hydroxypropylated starch , starch ether, with propylene oxide, increasing viscosity stability.
Hydroxyethyl starch, with ethylene oxide.
Starch sodium octenyl succinate starch used as emulsifier adding hydrophobicity.
Starch aluminium octenyl Succinate.
Cationic starch, adding positive electrical charge to starch carboxymethylated starch with monochloroacetic acid adding negative charge and combined modifications such as:

Phosphated distarch phosphate.
Acetylated distarch phosphate.
Acetylated distarch adipate, hydroxypropyl distarch phosphate, acetylated oxidized starch.

Modified starch may also be a cold-water-soluble, pregelatinized or instant starch which thickens and gels without heat, or a cook-up starch which must be cooked like regular starch. Drying methods to make starches cold-water-soluble are extrusion, drum drying, spray drying or dextrinization.

Other starch derivatives, the starch sugars, like glucose, high fructose syrup, glucose syrups, maltodextrins, starch degraded with amylase enzyme are mainly sold as liquid syrup to make a sweetener.

Examples of use and functionality of modified starch

Pre-gelatinized starch is used to thicken instant desserts, allowing the food to thicken with the addition of cold water or milk. Similarly, cheese sauce granules such as in Macaroni and Cheese, lasagna, or gravy granules may be thickened with boiling water without the product going lumpy. Commercial pizza toppings containing modified starch will thicken when heated in the oven, keeping them on top of the pizza, and then become runny when cooled.

A suitably modified starch is used as a fat substitute for low-fat versions of traditionally fatty foods, e.g. industrial milk-based desserts like yogurt or reduced-fat hard salami having about 1/3 the usual fat content. For the latter type of uses, it is an alternative to the product Olestra.

Modified starch is added to frozen products to prevent them from dripping when defrosted. Modified starch, bonded with phosphate, allows the starch to absorb more water and keeps the ingredients together. Modified starch acts as an emulsifier for French dressing by enveloping oil droplets and suspending them in the water. Acid-treated starch forms the shell of jelly beans. Oxidized starch increases the stickiness of batter.

Carboxymethylated starches are used as a wallpaper adhesive, as textile printing thickener, as tablet disintegrants and excipients in the pharmaceutical industry.

Cationic starch is used as wet end sizing agent in paper manufacturing.

KOMBUCHA

VASHNAVI WAKHRE

Kombucha is a fermented beverage made with tea, sugar, and water.

A SCOBY is a culture of yeast and bacteria which feeds on the sugar and nutrients of the tea. You can buy a SCOBY from us or grow you own.

The type of tea you use is important. Black tea is the most common, but white and green teas can also be used. Any tea flavored with essential oils, like chai and Earl Grey must be avoided.

There are two methods for brewing kombucha: batch brewing and continuous brewing.

Equipment needed is minimal: a source for boiling water, a pot for brewing tea, and a fermentation-safe jar.

What is Kombucha?

Kombucha starts with a mixture of brewed tea and sugar, which is fermented by a culture of yeast and bacteria. The result is a beverage that boasts a balanced blend of acidity and sweetness, with the sharpness of vinegar. For comparison, the pH of plain white distilled vinegar is often right around 2.4, while finished kombucha typically tests at 2.5 - 3.5 pH. The acidity of this beverage can be quite intense for a first time drinker, which is why it is usually enjoyed in small portions, and said to be an acquired taste. Commercial kombucha is usually always sold carbonated, which helps to transform the fermented tea into a fizzy and effervescent beverage that is refreshing and enjoyable to drink.

In this article, we'll go over how to obtain the crucial culture needed for fermentation (a SCOBY), as well as look at the different methods of brewing, and the equipment needed. Then we'll go over a beginner's brewing recipe, look at the different types of tea that can be used, and discuss when to add optional flavorings to improve your kombucha. Finally, I'll recap what I learned from my first brew day, and what I'm eager to try next.

What is a SCOBY?

The key ingredients of kombucha are water, tea, sugar, and a SCOBY, which is a Symbiotic Culture Of Bacteria and Yeast. There are a few ways to obtain a SCOBY, one of which is by purchasing it, or by getting one from a friend. As you continue to brew kombucha with your SCOBY, it eventually grows new layers, which must be removed in order to allow oxygen to normally pass through. If you know anyone that brews kombucha regularly, they're likely to have a piece of their SCOBY that they'd be willing to give you.

Grow Your Own SCOBY!

The third way to obtain a SCOBY is to grow your own at home, which is easier than it sounds. By purchasing a bottle of unflavored kombucha that is raw and unfiltered, there will be enough culture left behind in the bottle to kick off fermentation in your homemade batch. The commercial bottle of kombucha should be left out the night before brewing, which will encourage the culture to flocculate, indicating it's ready for use. The batch of kombucha will leave behind a baby SCOBY on the surface, which will increase in size and thickness over time. While the SCOBY feeds off of sugar, it also relies on nutrients provided by the tea. The type of tea used in kombucha is as important as any decision you make while brewing.

Types of Tea

The type of tea used in your kombucha will have an effect on the flavor of your final product. Additionally, the tea plays a crucial role in fermentation, providing nutrients for the SCOBY to feed on. Most commonly, you'll see recipes that feature a combination of green and black tea for flavor and nutrients. You can use green tea, white tea, or black tea, or a combination of two or three of these depending on the flavor that you desire. It is important to try to obtain the highest quality tea possible, and in this case, organic tea is almost a necessity.

There are some teas that should be avoided, however, as their ingredients can harm the SCOBY. Any tea that is flavored with essential oils, such as chai or Earl Grey, should be avoided due to the adverse effects that they may have on the culture. Additionally, herbal blends or those that are flavored and infused with oils and flavors should also be avoided for the same reason.

Types of Brewing Methods

There are two different types of brewing methods for making kombucha at home: batch brewing and continuous brewing. Both of these methods are simple, and can be utilized by beginners, and the main distinction is whether or not you expect to be making kombucha regularly.

It doesn't take much special equipment to utilize either method. You'll need a way to heat water, a large enough kettle or pot where you can brew your tea, and a jar for fermentation. In continuous brewing, it's best to use a jar that is ported and has a spigot at the bottom for ease of transferring. You'll then need to have the jar covered during fermentation, and we don't recommend using cheesecloth for this, because fruit flys can penetrate this.

Batch brewing might be best for the first time brewer, as it's ideal for anyone looking to brew the occasional batch. In this method, you're brewing with a ratio that is roughly a 9 to 1 solution -- that is, 9 parts of sugar and tea to 1 part starter. You'll start by putting your sweet tea, SCOBY, and a small amount of starter liquid (typically from a previous batch of kombucha or from a commercial bottle), into a jar, and cover it with a cloth secured with rubber bands to ferment at room temperature for roughly 7 days, or until it tastes to your liking. The finished kombucha is then transferred from the jar and off of the SCOBY, and into bottles for carbonating, if desired. Once done, you then have to figure out how to store and preserve your SCOBY until the next time you brew. This is why the alternative method, the continuous method, is ideal for preserving your SCOBY, and making kombucha regularly.

Continuous brewing has many benefits, including that it saves time and money. This method encourages you to leave behind roughly 25% of your fermented tea after each brew, preserving your SCOBY, and allowing you to refill and begin brewing when you're ready atop this starter liquid. This distinction means that there will be a ratio that is roughly a 3 to 1 solution of sugar and tea to starter liquid, and because of this stronger solution, it should finish fermenting in only a day or two, which is much faster compared to the 7 days the batch method requires.

Kombucha Ingredients and Recipe

One of the joys of making kombucha is how it encourages experimentation and creativity. That being said, you need a recipe to start with, and we've got a great recipe for brewing your first batch, and growing your own SCOBY:

16 bags of black tea steeped in 5 cups of filtered water

1 cup of white cane sugar

2 cups of starter liquid from raw unflavored kombucha

To begin, steep your tea for 4 minutes in 5 cups of water heated to 180 degrees fahrenheit. After 4 minutes, remove your tea bags, and add in your sugar, and mix until dissolved. In order to cool down and dilute this mixture, pour in roughly 9 cups of cold water. Once it is below 80 degrees fahrenheit, transfer to your fermenting vessel, and add in 2 cups of raw unflavored kombucha. Cover the opening of your vessel with a coffee filter, and/or towel or t-shirt to encourage oxygen exchange. Store your vessel at room temperature out of direct sunlight, and monitor the growth and development of your SCOBY. After 7 to 10 days, use a straw to taste your kombucha. When finished, there will be a pronounced balance of acidity and sweetness.

Flavoring Your Kombucha

The time to add flavorings to your kombucha is after it's completed fermentation. Flavorings like fruit will not only aid in enhancing the overall flavor of your beverage, but, when blended at the time of bottling, will encourage secondary fermentation for carbonation. It's always best to use the highest quality fruit you can find, with organic being ideal when possible. Fruits like berries, grapes, apples, and mangos can be juiced or pureed, and strained if desired, before adding to taste directly to the bottles before sealing and allowing to carbonate at room temperature. Other flavoring options include fresh or dried herbs, which you can steep with the kombucha for a couple of days in a secondary vessel before bottling. You can even add hops in secondary, making dry-hopped kombucha in the same way you would with home brewed beer.

Source-
https://www.morebeer.com/category/kombucha.html#Kombucha

HEALTH BENEFITS OF HOPS

PRIYANSHI SHARMA

Hops are the green cone – shaped flowers with a distinct benefit for craft brewers. They are the source of bitterness, aroma and flavour in beer. There are also various spices of hops and each of them has a different purpose. They are the first choice for any brewer to impart a perfect flavour and taste to the beer.

Following are the Health and Nutritional Benefits of Hops: -

1. Keep the skin young as it helps the body to fight various radiant and provide antioxidants to keep it healthier and brighter.

2. Reduces the Hairfall and dandruff as when we rinse the beer which contains Hops provides the natural shine to hair.

3. Prevents body ache as it is used in many pain killers.

4. Hops accelerate the metabolism of the body and hence improve the digestive system.

5. The anti – inflammatory property of hops, it provides relief from tooth ache and other oral diseases.

6. Anxiety is one of the biggest problems faced by the youngsters of today then, one should start using hops oil as it calms the body and mind and helps to fight against anxiety and mood swings.

7. It helps to treat cough and congestion and various respiratory disorders.

Now, Let's have a flashlight on Nutritional value of hops: -

➢ The hops oil contains Vitamin E, Vitamin B6 and Vitamin C which makes the immune system more active and less prone to diseases.

➢ Hops are also used to treat Insomnia [major psychological Disorder] as they are also used as drugs and treating people suffering from anxiety.

➢ It is also used for the treatment of ulcers as hops are also mixed with other herbs to treat the ulcer causing bacteria.

➢ The matured hops also help the individual to lose his/her body weight and maintain a healthy lifestyle.

➢ Chikungunya virus is an arthropod borne virus which is mostly characterized by fever. The various antiviral hops are also used for fast and efficient treatment of this virus.

➢ It also helps to improve the sleep patterns and habits

WINE REPORT

KANCHAN SINGH

Chapter Head - South Delhi, India
Apex Wine Club India
1 April 2023, Saturday

Indian wineries have started focusing on approachability, affordability and sustainability in order to respond to next generation consumer trends.

The market, which has introduced the use of cans and spritzers, has been re-energised by a resurgence in Indian viticulture.

There has been a renaissance in the rosé wine industry and the focus is on sustainability with a growth in the number of enthusiastic consumers. The industry is expected to grow by US$274 million by 2026, with a 29.3 per cent year-on-year growth in 2022.

Besides, the All India Wine Producers Association has benefited from the rationalisation of excise taxes and duties in Maharashtra and West Bengal, and the industry wants a separate category for wine in the excise lexicon.

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