BrewTimes™

APRIL 2023

BALAJI ENZYME & CHEMICAL PVT LTD

Akshay Mittal Industrial Estate
A-113, 1st Floor, Building No 5, Sir M V Road, Andheri (East),
Mumbai - 400059 | +91-22-460 31 666
E-mail : info@becpl.in | Web. : www.becpl.in

Introducing BrewTimes :

We M/s Balaji Enzyme & Chemical Pvt Ltd, are pleased to bring to you our April 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.

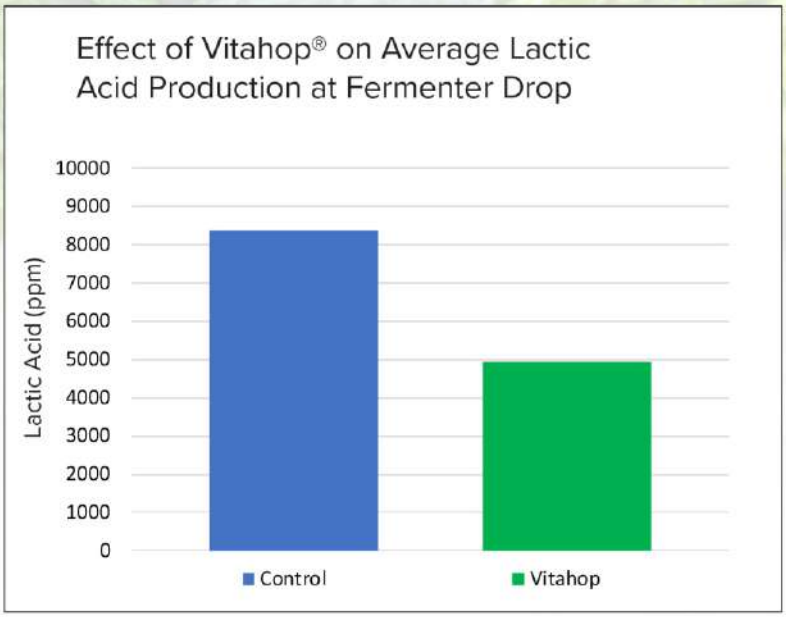
Vitahop® is used in both continuous and batch fermentations. It helps ensure healthy, vitalised yeast growth and during fermentation suppress gram positive bacteria. If bacteria are allowed to prosper, they will compete with and eventually inhibit the yeast, slowing fermentation sometimes to a complete 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**®**.**

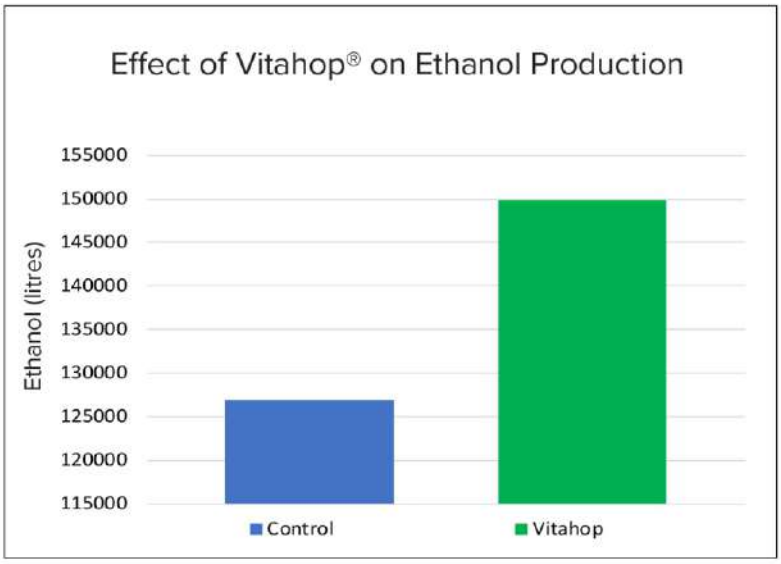
info@betatec.com | **betatec.com** | *efficient by nature*®

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

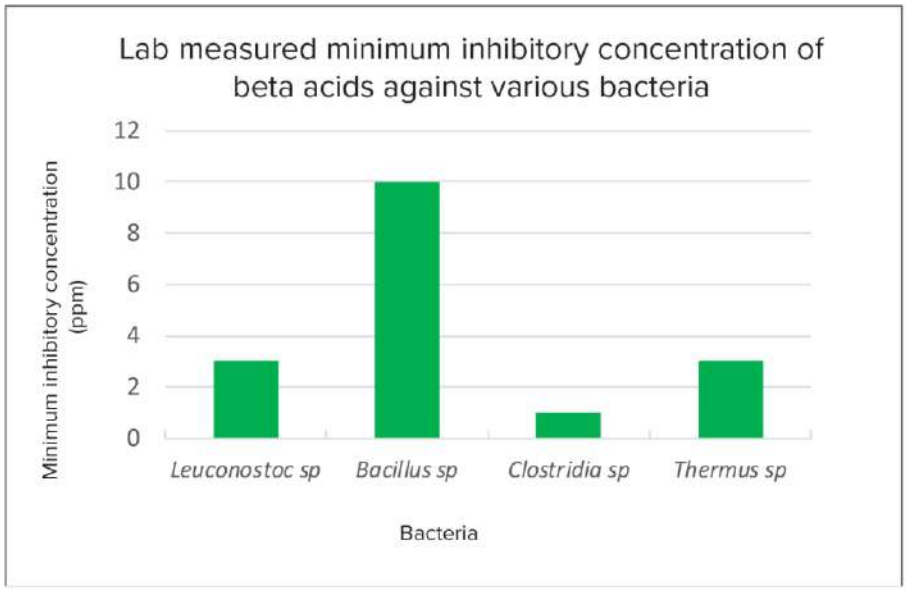
Reduce your sugar losses ...naturally

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.

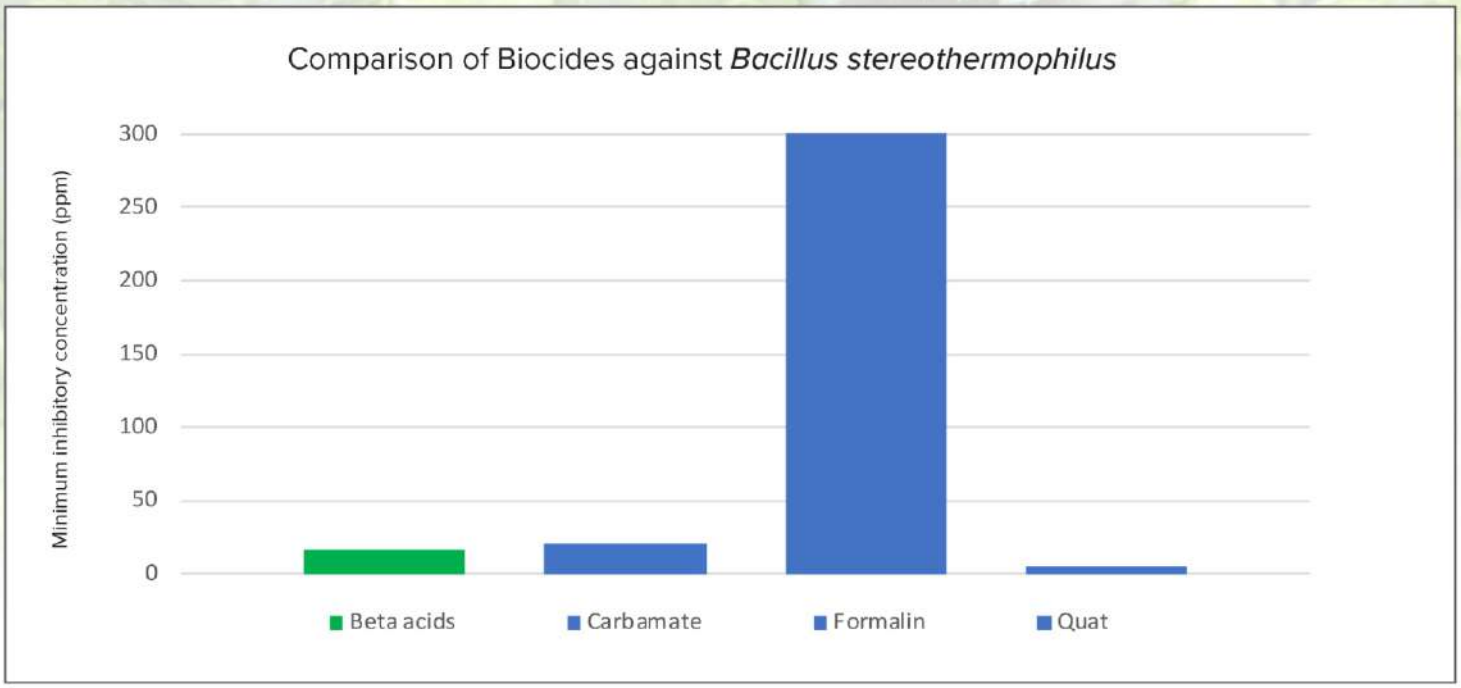


Key advantages of BetaStab® XL

- 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

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

BetaTec® hop products



BetaStab® XL

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 BetaStab® XL can help you.

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"

UNIVERSAL FORCES
PROMISING STEPS TOWARDS BIOENERGY

Presents

Biofuel Expo
A Future Energy Business Platform

Invitation

INDIAN EXHIBITION SERVICES

You're cordially invited to attend

BIOFUEL EXPO 2023

International Exhibition on
Biofuel Manufacturing Process & Technology,
Plant Machinery & Equipments and Allied Industries

FREE ENTRY

5th-7th JUNE, 2023

10AM - 6PM

Pragati Maidan, New Delhi, India

ORGANIZERS

R.S.V.P.:
Team
Biofuel

ORGANIZERS

MEDIA PARTNERS

ChiniMandi.com
Sugar ka search engine..!

SUGAR TIMES
SUGAR INDUSTRY MAGAZINE

ABKARI TIMES
MONTHLY HINDI NEWS MAGAZINE ON EXCISE & ALCO-BEV

BrewTimes

Tel : 91-120-3201291, +91-9811913376, +91-9142659818
Email: event@ies-india.com, For Delegate: gsi@gsi-india.com, Web: www.biofuelexpo.com

UNIVERSAL FORCES
PROMISING STEPS TOWARDS BIOENERGY

Presents

Biofuel Expo
A Future Energy Business Platform

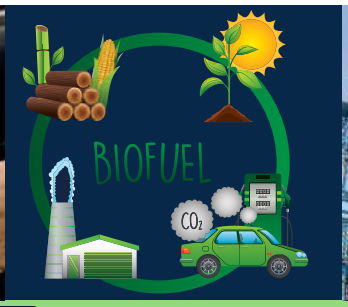
BIOFUEL EXPO 2023

INTERNATIONAL EXHIBITION ON BIOFUEL MANUFACTURING PROCESS & TECHNOLOGY, PLANT MACHINERY & EQUIPMENT'S AND ALLIED INDUSTRIES

05-07 JUNE 2023 | Pragati Maidan, New Delhi, India

CONCURRENT EVENTS

- **World Environment Expo (WEE 2023)**
- **Green India Awards 2023**



EXHIBITORS PROFILE

- Biofuel (Biodiesel, Ethanol, Biogas, Hydrogen) Manufacturers
- Biofuel Plant's Equipment's & Machine Manufacturers
- Biofuel Manufacturing Technologies
- Bio Refinery (Ethanol/Biofuel) Units
- Steam Turbine, Air Compressor Manufacturers
- Farmer Self Help Groups
- Fabricators & Consultants
- Research & Development Organization
- Government Institutions
- EPC Solution Company for Bio Ethanol Industries.
- EPC Machinery for Bio Ethanol Plant Manufacturers
- Beer, Malt, Wine , Carbonated Drink, Starch, Fruit Juice, Alcohol Grain And Molasses, Malt Sprits Whiskey .process & machinery suppliers.

ORGANIZERS

TITTLE SPONSOR

ASSOCIATION SUPPORT

ASSOCIATE SPONSORS

For Info : Balram Gupta : Mob.: +91-9142659818
E-mail: event@ies-india.com, balram@iisgs.com
Web: www.biofuelexpo.com

MEDIA PARTNER

BrewTimes

Presents

BIOFUEL EXPO 2023

International Exhibition on Biofuel Manufacturing Process & Technology, Plant Machinery & Equipment's and Allied Industries

05-07 JUNE 2023 | PRAGATI MAIDAN, NEW DELHI, INDIA

CONCURRENT EVENTS
- WORLD ENVIRONMENT EXPO (WEE 2023)
- GREEN INDIA AWARDS 2023

ORGANIZERS | TITTLE SPONSOR | ASSOCIATION SUPPORT | ASSOCIATE SPONSORS

MEDIA PARTNER: BrewTimes

For Info : Balram Gupta : Mob.: +91-9142659818, E-mail: balram@iisgs.com, Web: www.biofuelexpo.com

---

Biofuel Expo
A Future Energy Business Platform

ORGANIZERS

BIOFUEL EXPO 2023

International Exhibition on Biofuel Manufacturing Process & Technology, Plant Machinery & Equipment's, and Allied Industries

DELIGHTED TO RECEIVE

THE SUPPORT OF

BrewTimes

AS A MEDIA PARTNER

05-07 June 2023 | Pragati Maidan, New Delhi, India

For Info : Balram Gupta : Mob.: +91-9142659818
E-mail: balram@iisgs.com, event@ies-india.com, Web: www.biofuelexpo.com

CLEANING AND DISINFECTING IN BREWING

BIJAY BAHADUR

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

Introduction

In the brewery, cleaning and disinfecting are of overriding importance when it comes to the quality and shelf-life of the product. Comprehensive and regular cleaning and disinfecting measures, which must always be considered to go hand-in-hand, are therefore an important requirement for proper process management. Necessary measures are always to be carried out based on a fixed schedule that takes the type of product and operational anomalies into account. Cleaning and disinfecting have two different goals:

1. Product – contaminating substances are to be fully removed
2. Microorganisms are to be rendered inactive

Basically, contamination can be divided into two types:

1. <u>Inorganic contamination, which includes:</u>
   - Rust
   - Metal grit
   - Glass grit
   - Dust
   - Water scale
   - Beer scale
   - Soil (inorganic part)

2. <u>Organic contamination, which includes:</u>

   - Beer residues
   - Hop resins
   - Residue (organic parts) of cleaning and disinfecting agents
   - Fibers
   - Body greases
   - Soil (organic part)
   - Bacteria
   - Yeast
   - Molds

Cleaning

Cleaning is the removal of contamination or undesired residues from hard surfaces with the aid of chemical and/or physical cleaning methods and agents. Factors for successful cleaning include:

- Temperature (hot cleaning, cold cleaning)
- Cleaning time (the longer the cleaning time, the greater the cleaning success)
- Mechanics (pressure, volume flow, flow speed)
- Chemical (type and concentration of the cleaning agent)

The most important factor is the selection of a suitable cleaning agent. The following minimum requirements must be met by a suitable cleaning agent:

- Quick and completely solubility in water.
- Quick swelling and detachment of the specific main components of the contaminant (e.g., protein, beer scale, hop resins and fur)
- High soiling - carrying capacity
- Easy rinsing, so as to reduce the final rinsing times
- Non-foaming or foam - reduction property for other foams
- Compatibility with materials used in production systems

An important requirement for effective cleaning is the ability to determine the concentration of the cleaning agent solution. This occurs either via simple titration or, in the case of automatic cleaning-in-place (CIP) systems, the concentration is determined via conductivity.

Mechanics are the physical conditions required for cleaning. These include the pressure (min. 3-5 kg/cm^2), volume flow and flow speed (3-4 m/s). These technical requirements must be taken into account during the planning and installation of the systems. The temperature of the cleaning agent depends on the technical options, stubbornness of the contamination to be removed and, of course, chemical composition of the cleaning agent solution itself.

The following temperature ranges are common:

- Fermentation tanks, storage tanks and bright beer tanks: cold to 40 °C
- Brewhouse, lauter tuns, mash tuns, wort coolers, all pipelines: 70-90 °C

The chemical processes of breaking up soiling (e.g., dissolving stone via acids), swelling of soil (e.g., with dried-on starch and protein residues), saponification (e.g., with greases), dispersion (e.g., hop resins) and rinsing clean are subject to rate laws. Strictly speaking, the soaking time means the contact time of the cleaning agent with the soiling at the right concentration and temperature.

Within certain limits, the temperature, time, mechanics and chemical factors can be exchanged with one another. It is thus possible, for example, to compensate for a low cleaning temperature by increasing the cleaning agent concentration and/or the flow speed.

Cleaning Agents

Basically, cleaning agents can be divided into three large groups: neutral, alkaline and acidic. Cleaners within each group have different compositions (Table 1). Neutral cleaning agents are used when easily water - soluble, dispersible or emulsifying contamination is to be removed from surfaces. Alkaline cleaning agents are then used when organic contamination that is not easily water - soluble is to be removed. In this case, a chemical transformation occurs – water-insoluble residues are changed to water-soluble fragments. Poorly water-soluble mineral contamination is removed when acidic cleaning agents chemically transform it into water-soluble salts.

Alkaline Cleaning Agents

Sodium hydroxide exhibits an excellent emulsifying capacity for protein. Accordingly, it is used in a wide variety of applications in breweries. Caustic potash has an even greater capacity for breaking up soiling than sodium hydroxide. It is only used in limited applications; however, due to the fact that is several times more expensive.

The disadvantages of sodium hydroxide include:

- No dispersion properties
- No surface - active effect
- No sequestering powers
- Not easily rinsed out
- Attacks aluminum
- Foams at high pressure

To reduce these disadvantages to a minimum, various additives are added to the caustic soda solutions depending on the requirements of the situation. Since alkaline solutions strongly tend to foam up, defoamers (anti-foaming agent) must be added to them. A differentiation between hot and cold defoamers is:

- While hot defoamers are used for bottle cleaning
- Cold defoamers are used as foam inhibitors in brewhouse and pipe cleaning.

In many cases, more than just pure sodium hydroxide and an additive are used. In these cases, so-called prepared cleaners are used (i.e., the user receives a prepared concentrate, which he must then dilute to a specific usage concentration).

Alkaline products are not suitable for use with aluminum, however. Special cleaning agents containing silicates must be used for aluminum system parts. Silicates are also contained in alkaline cleaning agents. They have very good cleaning, dispersion and emulsifying properties. Sodium meta-silicate is a very good corrosion inhibitor for aluminum. When using high temperatures, the silicate content in the cleaning agent may not be too high, otherwise there is a risk that calcium silicate may be precipitate. This is very difficult to remove.

Table 1 Cleaning Agents and Additive Substances.

Component	Active Ingredient	Remarks	Use
Alkalis	NaOH/KOH	Removal of organic soil; carbonate formation via CO_2	CIP cleaning; bottle cleaning; keg cleaning; foam cleaning; floor cleaning
Acids	Phosphoric acid	Inorganic acid; removal of inorganic and organic soiling; release of phosphate in waste water.	CIP cleaning; keg cleaning; foam cleaning
	Nitric acid	Inorganic acid; removal of inorganic contamination (beer scale); passivation of stainless steel; release of nitrates in waste water.	CIP cleaning; keg cleaning;
	Sulfuric acid	Inorganic acid; removal of inorganic contamination (beer scale); concentrate attacks stainless steel	CIP cleaning; bottle cleaning
	Hydrochloric acid	Inorganic acid; removal of inorganic contamination (hardness-mineral deposits); high corrosion potential.	Stone removal systems; neutralization of waste water
	Citric acid	Organic acid; removal of inorganic soiling.	CIP cleaning; foam cleaning
Additive Substances			
Oxidizing cleaning booster	Hydrogen peroxide; chlorine	For the detachment of suborn organic incrustations; products decompose during cleaning process	CIP cleaning; special cleaning in circulation process
Dispergators; sequestering agents	Polycarboxylates; phosphonates	Increase the soil-release capacity of the cleaning solution; improve cleaning success	Bottle cleaning; CIP cleaning
Surfactants; defoamers	Non-ionic surfactants	Decrease the surface tension of the cleaning solution; prevent disturbing foam forming	Bottle cleaning; CIP cleaning
Complexing agents	EDTA; gluconate; phosphate	Complexing of the water-hardness and metal ions in the solution; prevent precipitation and deposits	Bottle cleaning; CIP cleaning; alkaline foam cleaning
Solubilizers	Alcohols; glycols	Stabilize individual ingredients in the concentrate of prepared cleaning agents	Prepared cleaning agents

Another ingredient of alkaline cleaning agents is sodium carbonate. It does not exhibit great cleaning, dispersion and emulsifying properties, but can be used as a component of the cleaning agent formulation for aluminum.

The primary purpose of the inclusion of complexing agents in alkaline cleaners is to prevent the formation of deposits on surfaces. They complex the builders of water hardness so that they cannot be deposited on heat-exchanger surfaces, for example. These types of complexing agents do not only sequester the minerals causing hardness dissolved by water, but can also dissolve mineral precipitations when used for a longer period of time.

Dispersion agents enhance the soil-release ability of the cleaning solution and prevent the growth of hardness - mineral crystals in water. They are advantageous in that they do not react with metal ions 1: 1 as do complexing agents. Differentiation is made between anionic, cationic, amphoteric and non-ionic surfactants. Anionic and non-ionic surfactants primary function as cleaners.

The advantages of using surfactants include:

- Surfactants allow the cleaning solution to penetrate into narrow gaps by lowering its surface tension.
- Surfactants facilitate the penetration of the cleaning solution and thus accelerate the swelling of residue.
- Surfactants emulsify grease in the aqueous phase.
- Surfactants also transform water - insoluble soiling into an apparently soluble form.

Acidic Cleaning Agents

The most suitable acidic cleaners are products with phosphoric acid. Phosphoric acid far exceeds nitric acid and sulfuric acid in its cleaning power. In conjunction with surfactants, products based on phosphoric acid are not harmful to stainless steel, even at greater temperatures (over 80 °C).

Mineral deposits (e.g., beer scale and water scale) are best removed with nitric acid cleaning agents. They transform water-insoluble salts into water-soluble, easily rinsing form. Nitric acid is not harmful to stainless steel. These products can also be used on aluminum. They are harmful to non-ferrous metals, however. The use of nitric acid products is not without risks, since the reaction with organic substances can release poisonous nitrous gasses.

Disinfecting

A Beer residue is the ideal nutrient media for every type of microorganism; at the same time as it is necessary for fermentation, but they can also cause spoilage beer. To prevent biologically induced spoilage, beer must be protected from contamination with germs. Sufficient protection is only achieved through hygienic production and packaging. Disinfecting agents used in the food/beer industry are tasked with making production equipment free of microorganisms after use and subsequent cleaning. Microorganisms can be killed physically and chemically. Disinfecting with chemicals is possible via a host of disinfecting agents.

Efficient disinfecting with any agent can only be ensured when a clean, physically intact smooth surface is being treated. All pores, cracks, deposits and other surface damages hinder meaningful disinfecting.
The requirements of disinfecting agents are as follows:

- Range of microbicidal effectiveness
- Effectiveness at low temperatures
- Toxicity
- Effectiveness under organic load
- Easily rinsed out
- Material compatibility (danger of corrosion)

- Stability when stored
- Environmental friendliness
- Economy

The following active disinfecting substances are important in the beverages industry (Table 2):

- Substances containing active chlorine.
- Oxidizing agents.
- Aldehydes.
- Biguanides.
- Quaternary ammonium compounds (QAC s).
- Chlorine dioxide.
- Halogenated carboxylic acids.

Table 2 Disinfecting substances.

Active Ingredient	Remarks	Use
Peroxyacetic acid	Acidic disinfecting agents with oxidizing effect (destroy cell membrane); conditional stackable due to loss of effectiveness; automatic dosing via inorganic conducive acids only; sealing materials may be harmful with extended contact; very broad range of effectiveness.	Bottle cleaning; CIP cleaning
Hydrogen peroxide	Neutral disinfecting agent with oxidizing effect; very environmentally and waste water friendly, since it decomposes with organic material in water and oxygen; high usage concentration; very broad range of effectiveness	CIP cleaning; spray disinfecting
Active chlorine (sodium hypochlorite)	Alkaline disinfecting agent with oxidizing effect; danger of chlorophenols formation (negatively effects taste of the product); very broad range of effectiveness; ATTENTION: when mixing with acidic solutions, chlorine gas is released!	Bottle cleaning; CIP cleaning; drinking-water disinfecting
Chlorine dioxide	Disinfecting agent with oxidizing effect; two-component system that is mixed on-site when used; economical operating costs, but high investment costs; very broad range of effectiveness.	Bottle cleaning; CIP cleaning; drinking-water disinfecting
Quaternary ammonium compounds	Neutral disinfecting agent (surfactants); destroys the cell membrane; heavily foaming (not suitable for CIP); surface-active; relatively difficult to rinse out due to the surface activity (adheres well to the surface).	Static disinfecting; spray disinfecting
Biguanides	Neutral disinfecting agent; destroys the cell membrane; forms deposits in alkaline medium; well suited to manual applications.	Head space disinfecting; static disinfecting; spray disinfecting
Aldehydes	Neutral disinfecting agent; broad range of effectiveness and thus highly effective; oxidizes with air and then forms brown deposits	Static disinfecting; head space disinfecting
Halogenated carboxylic acids	Acidic disinfecting agent; very broad range of effectiveness; cannot be processed manually due to high toxicity; release AOX in waste water; offered as a combined cleaning and disinfecting agent together with inorganic acid.	CIP cleaning

AOX: sum of all absorbable organic halogen substances

In the past, disinfecting products containing phenol derivatives were used often. Today, however, they are of very little importance in this field.

Products containing active chlorine have long been used to disinfect systems in the food industry. Generally, products based on sodium hypochlorite are used. In the weak acidic range, chlorine disinfecting occurs much quicker than in the alkaline range. For one thing, the decreasing stability of the chlorine carrier on the acidic level greatly reduces its usefulness. There is also a risk of pitting of chrome-nickel-steel and aluminum surfaces on the acidic level. It is absolutely imperative that the pH range be between 10 and 12.

Products containing active chlorine can form chlorophenols through reactions with organic substances and thus considerably damage the sensory experience of beer and alcohol - free beverages. Peroxyacetic acid causes oxygen absorption and thus promotes oxidizing processes in beer. Disinfecting agent residue that does not visibly affect the beer can otherwise affect the senses unpleasantly. For this reason, the law requires that final rinsing be carried out for each agent. This is also absolutely necessary for quality reasons.

Cleaning and Disinfection

Cleaning is separation, absorption and /or removal of dirt from any surface.

Disinfection is deactivation of microorganism in order to avoid infections. We should be cleaning and disinfection always both step because of residual soil can impair the efficiency of disinfectants and soil may shield microorganisms from the disinfectants. The factors decisive to an optimal cleaning and disinfection results are temperature, concentration, mechanical force and contact time.

The main composition of cleaning agents are NaOH, Acid, Surfactants (Wetting agents), Enzymes, Water Conditioners and Oxidizing agents e.g. chlorine or hydrogen peroxide.

In the brewing process, fat is removed by alkaline and surfactants. Protein is removed by strong alkaline. Mineral are removed by acid and carbohydrates are removed by NaOH.

Disinfection is 99.99 % kill or deactivate microorganism; different kinds of disinfectants are hypochlorite, hydrogen peroxide, peracetic acid, iodophor and chlorine dioxide.

The most critical aspects of brewing

CIP (Clean-in-Place)

CIP (Clean-in-Place) is a means by process equipment, machines, vessels, associated fittings and associated pipe work can be thoroughly cleaned without dismantling. It can be totally automatic, semi-automatic or manual. CIP and process sterilization is one of the most critical aspects of brewing to ensure the health and safety of the consumer.

Factors Affecting Cleaning

CIP systems circulate cleaning solution in a cleaning circuit through pipe work, machines, vessel and other associated equipment. The cleaning cycle compromises different stages with water and cleaning detergents and each stage requires a certain length of time, temperature, flow, velocity and concentration of detergent to achieve an acceptable result.

Glossary of Terms:

Disinfection: The reduction in the number of micro-organisms on a surface to a level which is acceptable in the context of the product being produced, the process being used and the standards to be achieved.

Sterilization: The complete elimination of all living organisms from a surface or vessel.

The Cleaning Sequence:

1.	Pre-flush	: To remove gross soil
2.	Caustic circulation	: To remove organic soil
3.	Intermediate flush	: To flush caustic before acid cleaning
4.	Acid circulation	: To remove inorganic soil
5.	Sterilant circulation	: To destroy remaining microorganism
6.	Final flush	: To flush out sterilant.

Cleaning detergents used in brewing industry

1. Caustic Soda:

Caustic (Sodium hydroxide: NaOH) is a metallic base predominantly ionic, containing sodium cations and hydroxide anions. It is used in many industries, mostly as a strong chemical base in the manufacture of pulp and paper, textiles, drinking water, soaps and detergents.

Advantages:

- Excellent detergency properties when "formulated"
- Disinfection properties, especially when used hot.
- Effective at removal of protein soil.
- Lends itself to automatic control by conductivity meter
- More effective than acid in high soil environment
- Cost effective.

Disadvantages:

- Degraded by CO_2 forming less effective carbonate.
- Ineffective at removing inorganic scale.
- Poor rinseability.
- Not compatible with Aluminum and other soft metals.
- Activity affected by water hardness

2. Acid:

Acid cleaning is a process used to inorganic soils. Depending on the material to be cleaned, and the type of stains that are present, the cleaning acid employed may be strong or mild.

Advantages:

- Effective at removal of inorganic scale
- Not degraded by Co_2
- Not affected by water hardness
- Lends itself to automatic control by conductivity meter.
- Effective in low soil environment
- Readily rinsed

Disadvantages:

- Limited effectiveness at removing organic soil
- Limited biocidal properties
- Limited effectiveness in high soil environments
- High corrosion risk e.g., Nitric Acid

3. Chelating Agents:

Materials which can complex metal ions in solution, thereby preventing precipitation of the insoluble salts of the metal ions. It is a substance whose molecules can form several bonds to a single metal ion. In other words, a chelating agent is a multidentate ligand. There are many sequestering agents e.g., EDTA.

4. Wetting Agents:

Wetting agents are compounds that lower the surface tension of a liquid, the interfacial tension between two liquids, or that between a liquid and a solid. Surfactants may act as detergents, wetting agents, emulsifiers, foaming agents, and dispersants. A material which can be used to reduce surface tension (wetting), the emulsification of fats or control foam Surfactants can be classified as follows: non-ionic, anionic, cationic, amphoteric.

Cleaning Methods

CIP is the automatic internal cleaning of production plants, such as tanks, containers, heaters, hoses and pipelines. Production plants covered with product residues are cleaned and disinfected without the need for disassembly. Cleaning and disinfecting agent solutions are sprayed onto the surfaces to be cleaned using pumps via suitable sprayers. CIP cleaning and disinfecting methods must ensure that all parts contacted by the foodstuff are clean. The condition here is that the production plant and CIP system must be constructed in such a way that this requirement is fulfilled.

Isolated CIP systems are required for the following production areas of a brewery:

- Brewhouse
- Pre - filtrate (fermentation tank, storage tank).
- Filtration and special systems.
- Filtrate (bright beer tank, filling).

To clean and disinfect a production plant with the CIP method, cleaning and disinfecting agent solutions that are pumped through these systems in the circuit are required. These cleaning solutions must be provided by a supply system according to the consecutively occurring rinsing, cleaning and disinfecting steps. Two method variants are available:

- 'Non-recovery' CIP cleaning with single use of a freshly prepared cleaning solution.
- 'Recovery tank' CIP cleaning with multiple reuses of prepared cleaning solutions.

Depending on the type and quantity of soiling in the individual areas of a brewery, there are a variety of options for cleaning and disinfecting (Table 3). Heavily soiled vessels in the brewhouse and pipelines are usually cleaned with an alkaline solution after pre - rinsing, and acidic cleaning occurs after the corresponding intermediate rinsing.

Table 3: Overview CIP variants

Applications	**Programs**				
	Alkaline & acidic cleaning	**Alkaline & acidic cleaning/disinfecting**	**Alkaline & combined acidic cleaning/disinfecting**	**Acidic cleaning & disinfecting**	**Combined acidic cleaning/disinfecting bright beer tanks**
	Brewhouse vessels; pipelines	**FV/SV; pipelines**	**FV/SV; pipelines**	**SV/BBT**	
Program steps					
Pre-rinsing	x	x	x	x	x
Alkaline cleaning (1.5% - 2% NaOH; 0.3% additive)	x	x	x		
Intermediate rinsing	x	x	x		
Acidic cleaning (1% - 1.5% acid)	x	x		x	
Combined acidic cleaning and disinfecting (1% acidic cleaner/disinfecting)			x		x
Intermediate rinsing		x		x	
Disinfecting (0.3% peroxyacetic acid)	x	x		x	
Final rinsing	x	x	x	x	x

From an economic and, just as important, ecological standpoint, CIP systems should be operated optimally. Cost savings are possible through the reduction of energy costs, and time can be saved in rinsing procedures, reduction of the quantities of fresh water used and thus the waste water quantity, and through the proper usage concentration of the cleaning and disinfecting products. Analysis tools that can measure the temperature, pressure, conductivity value, volume flow and valve setting parameters during a cleaning and disinfecting step are available today. They are then displayed graphically after the analysis.

After the analysis and interpretation of the measurement results (actual state), it can be determined whether the cleaning and disinfecting programmes are set optimally or whether there is potential for savings.

Work Safety and Environmental Protection

Cleaning and disinfecting agents are more or less dangerous chemicals. To sufficiently protect the health of the personnel handling these substances, the information on the material safety data sheet must be observed. In general, it should be mandatory to wear safety goggles and the recommended protective clothing when handling chemicals.

The product information sheet on cleaning and disinfecting agents should also be read thoroughly and observed. Recommended usage concentrations and temperature specifications are to be complied with, which also protects the environment.

Used cleaning agent solutions are often heavily alkaline (pH >11) and must be neutralized to the legally prescribed pH value before being released into the public sewerage system.

Validation of CIP

It is essential that procedures are followed to ensure that CIP processes are carried out correctly. Two types of validation procedure are used. Firstly, checks must be made to confirm that the conditions employed during the cleaning process were within the predetermined specification. Secondly, the cleanliness of the plant must be assessed against predetermined standards.

CIP checks include cycle times, temperatures and the strengths of cleaning chemicals. Assuring that the correct concentration of caustic soda-based detergent is used is worthy of special comment. Commonly, the strengths of solutions of caustic soda are assessed by measurement of conductivity. Such readings can be misleading since conversion of sodium hydroxide to sodium bicarbonate following exposure to carbon dioxide does not produce a change in this parameter. Preferably, the concentration of caustic soda solutions should be checked by off-line titration.

Validation of CIP is essential when new plant is commissioned. Since CIP is a costly and time-consuming process it is necessary to employ conditions that provide the desired level of cleaning at the lowest cost.

References

1. *Handbook of Brewing, Edited by Fergus G. Priest & Graham G. Stewart*
2. *Handbook of Brewing, Edited by Hans Michael Eblinger*
3. *Handbook of Brewing, Edited by William A. Hardwick*
4. *Brewing – A Practical Approach, Bijay Bahadur, 2016*

4th Trade Fair and Conference for Beer, Wine and Spirits Production

13 – 15 September, 2023

Manpho Convention Centre, Bengaluru

Brews & Spirits EXPO

Crafting Collaborative Opportunities

Trade Fair • Conference • B2B Meetings • Technical Workshops • Masterclasses & Tastings
Networking Events • Flair Bartending Contest • Awards

Supported by: AIDA, APEX Wine Club India, CIABC Confederation of Indian Alcoholic Beverage Companies, Fragrances & Flavours, Gin Explorers Club, WSDI Wine & Spirits Club of India

Organised by: PDA Ventures

Official Publication: Brews & Spirits

Conference Partner: tulleeho!

Conference Pen & Notepad Partner: Hypro Synonym of TRUST

Workshop Partner: VLB Berlin

Market Research Partner: Euromonitor International

BOOK YOUR SPACE NOW

www.brewsnspiritsexpo.com

Contact: Utsav Kumar
E: utsav@pdaventures.com
M: +91-9886044334

INSTANT BEER POWDER MARKET DEMAND

PRADEEP DWIVEDI

CEO of Nutrelis Agro Foods, Noida
Email – info@chicoree.in
Mobile - 9599438851

Instant beer powder is a relatively new product that has recently gained popularity in the market. It is a powdered form of beer that can be quickly mixed with water to create a refreshing beverage. The process of making instant beer powder involves removing the water content from beer and creating a dry powder that can be reconstituted with water.

This article will provide a detailed overview of instant beer powder, including its history, production process, benefits, and drawbacks.

History of Instant Beer Powder:

The concept of instant beer powder is not entirely new. In the past, there have been various attempts to create a powdered form of beer. However, these attempts were not successful as the resulting product was not palatable. The main reason for this was the inability to preserve the flavor and aroma of beer during the drying process.

In recent years, advances in technology and the development of new drying techniques have allowed for the production of instant beer powder that is similar in taste and aroma to traditional beer. This has led to an increase in demand for the product, especially in countries like China, where it is a popular ingredient in cooking and baking.

Production Process:

The production process of instant beer powder begins with the selection of high-quality beer. The beer is then subjected to a process of vacuum distillation, where the water content is removed, leaving behind a concentrated liquid. This concentrated liquid is then spray-dried to create a fine powder that can be easily mixed with water.

The spray-drying process involves spraying the concentrated liquid into a chamber where hot air is blown through it, causing the water to evaporate, leaving behind the dry powder. The resulting powder is then packaged into individual sachets or bulk containers for sale.

Benefits of Instant Beer Powder:

1. Convenience: One of the significant advantages of instant beer powder is its convenience. It is easy to store, transport and use, making it ideal for outdoor activities, camping, and travel. It is also a convenient alternative

Market Demand of Instant Beer Powder:-

The beer industry is one of the largest and most lucrative industries in the world. The global beer market is expected to reach $754.8 billion by 2025, growing at a CAGR of 6.1% from 2020 to 2025.

The demand for beer has increased significantly over the past few years due to the rise in disposable income and changing lifestyles of people. However, with the increasing demand for instant beer, the market is expected to witness a surge in the coming years.

Instant beer is a type of beer that is brewed using a unique process that involves the use of freeze-drying technology. This technology helps to remove the water from the beer, leaving behind a powder-like substance that can be easily reconstituted by adding water. The process of making instant beer is similar to making instant coffee or tea. The beer is brewed, filtered, and then freeze-dried to remove all the moisture. This results in a product that has a longer shelf life and is easier to transport and store.

One of the main advantages of instant beer is its convenience. Unlike traditional beer, which needs to be kept cold and consumed immediately, instant beer can be stored at room temperature and can be easily transported. This makes it an ideal option for outdoor activities like camping, hiking, and picnics. Additionally, instant beer is also an excellent choice for people who want to enjoy a cold beer without having to wait for it to chill.

The demand for instant beer is increasing rapidly, especially in developing countries where the demand for beer is on the rise. The growth of the instant beer market is driven by factors such as the increasing demand for convenience foods and beverages, changing lifestyles, and the rise in disposable income. Additionally, the growing trend of online shopping has also contributed to the growth of the instant beer market. Consumers can now easily purchase instant beer online and have it delivered to their doorstep.

Another factor that is driving the demand for instant beer is the changing taste preferences of consumers. Today's consumers are looking for new and innovative products that are different from traditional beer. Instant beer offers a unique taste and flavor profile that is different from traditional beer. Additionally, instant beer can also be flavored with various fruits and spices, making it a popular choice among consumers who want to experiment with different flavors.

The market for instant beer is highly competitive, with several players competing for market share. Some of the leading players in the market include AB InBev, Heineken, Carlsberg, Suntory Holdings, and Asahi Group Holdings. These companies are investing heavily in research and development to come up with new and innovative products that cater to the changing tastes and preferences of consumers.

However, the instant beer market is not without its challenges. One of the main challenges is the high cost of production. The freeze-drying technology used to make instant beer is expensive, and this increases the cost of production. Additionally, the taste and flavor of instant beer may not be as good as traditional beer, which could be a barrier to adoption.

Conclusion

the demand for instant beer is expected to increase significantly in the coming years. The convenience, longer shelf life, and unique taste and flavor profile of instant beer make it an attractive option for consumers. However, the market for instant beer is highly competitive, and companies will need to continue investing in research and development to come up with new and innovative products that cater to the changing tastes and preferences of consumers

Did you know that your favourite brewski might be doing more than just quenching your thirst? Discover the surprising link between beer and gut health, and how the hops and yeast in your pint could be nourishing the good bacteria in your digestive system.

KRITHIKA. V

M.SC. FOOD SCIENCE AND NUTRITION
PONDICHERRY UNIVERSITY

Beer is one of the oldest and most popular alcoholic beverages in the world, with a rich history that dates back thousands of years. While beer has often been associated with negative health effects, recent research suggests that it may actually be good for your gut health.

Gut health is a hot topic in the world of nutrition and health, and for good reason. Your gut is home to trillions of microorganisms that play a crucial role in many aspects of your health, including digestion, immunity, and even mental health. The microbiome, which refers to the collection of microorganisms in your gut, is incredibly complex and diverse, and research suggests that it can be influenced by many factors, including diet.

Beer, like many fermented foods and beverages, is rich in probiotics, which are beneficial bacteria that can help to promote a healthy gut microbiome. Probiotics can help to support digestive health, boost immunity, and even improve mental health.

One of the key components of beer that makes it beneficial for gut health is the yeast used in the fermentation process. Yeast is a type of fungus that plays an important role in the fermentation of beer, and it also happens to be a rich source of probiotics. The yeast in beer can help to improve the balance of bacteria in your gut, which in turn can lead to a healthier and more diverse microbiome.

Beer also contains prebiotics, which are a type of fibre that can help to feed the good bacteria in your gut. Prebiotics can be found in many different types of foods, including fruits, vegetables, and whole grains, but beer is a particularly rich source of these beneficial fibres.

In addition to its probiotic and prebiotic properties, beer also contains antioxidants, which can help to reduce inflammation in the body. Inflammation is a natural response to injury or infection, but chronic inflammation has been linked to many different health problems, including heart disease, diabetes, and even cancer. The antioxidants in beer can help to reduce inflammation, which in turn can help to protect against these and other chronic diseases.

It's important to note that while beer can be good for your gut health, it's important to consume it in moderation. Drinking too much alcohol can have negative effects on your health, including damaging your liver and increasing your risk of certain types of cancer. It's also important to choose high-quality, organic beers that are free from harmful additives and preservatives.

In conclusion, beer can be a surprisingly good choice for promoting gut health. With its rich content of probiotics, prebiotics, and antioxidants, beer can help to improve the balance of bacteria in your gut, support digestion, boost immunity, and reduce inflammation. Just be sure to enjoy it in moderation and choose high-quality, organic beers for the best results. Cheers to good gut health!

UNDERSTANDING APPERENT ATTENUATION LEVEL OF MALT TO ESTIMATE FINAL BEER GRAVITY

SAURABH N. PERKAR

BREWER
ALCHEMY MICROBREWERY, BANGALORE

Have we ever wondered some times that some of beer doesn't ferment below some gravity points. Its stay stucked even though we pitched yeast as per requirement with desired nutrient quantity also.

It usually happens with beers made with more speciality malts included malt bill.
Or poorly managed temperature during mashing and mostly important not maintaining right overall diastatic power in malt bill.

Some scientist have made an way to calculate apperent attenuation level of malt.
This A.A.L. indicate the % of fermentability of wort based on following parameters.

Alpha amylase activity

Total limit dextrinase activity

Kobalsch index

Total beta amylase activity

Beta amylase thermostability

But how we can use this information for our brewing process.

Lets have an example, we have a malt which we will use 100 % in our malt bill.

Lets consider that malt have

DP of 184

B-amylase activity 220 U/g

A-amylase activity 160 U/kg

L-dextrinase activity 286 U/kg

Kobalsch index 48.3

And from mash temperature and rest time B-amylase thermostability is 28.9

This above mentioned parameters changes as per malting company so need to get data about it from maltsters. And thermostability of beta amylase is all depends on mashing temperature and mash rest time.

So from all above data we calculated 93.1% fermentability of wort.

So now we can put this value in apperent attenataion formula which is used for yeast also. From that our calculated final gravity is 1.006 S.G.

This calculation is really important while making stout, doppelbock, wee heavy kind of beer where we heavily use speciality malt and as we know speciality malt doesn't have any diastatic power.

This calculation can be used to study if there is any need of supplementing mash enzymes as well if using poorly modified malt.

If maltsters cant provide data apart from diastatic power and kobalsch index then there is way to calculate other parameters needed based on D.P. we will discuss about it next time.

Cheers, happy brewing

Can Hops Help You Sleep?

AKSHAT JAIN

Business Development Manager-Craft Brewing

What are hops?

Hops are the female flowers from the hop plant, Humulus lupulus. They're most commonly found in beer, where they help produce its bitter flavor. Hops also have a long history of use in herbal medicine, dating back to at least the 9th century in Europe. They have traditionally been used to treat a variety of ailments, ranging from indigestion to Hansen's disease (leprosy).

Once hops became an important ingredient for beer manufacturers, scientists began studying the effects they can have on your body. Common areas of study include hops' potential usefulness for treating sleep disorders. While more research is needed, studies suggest that hops may help improve sleep quality.

How do hops affect sleep?

Long ago, anecdotal evidence began to emerge that hops have the potential to promote sleep. In Europe, people began noticing that field workers who cultivated hop plants tended to fall asleep on the job more than usual. Their work was no more physically demanding than any other fieldwork, so people began to wonder if hops had sedative properties.

Early scientific studies found no solid evidence to support claims of hops' sleep-inducing potential. More recently, researchers have taken a closer look at hops and their effect on anxiety and sleep disorders. Several scientific studies suggest that hops do have sedative effects.

For example, a study reported in the journal PLOS OneTrusted Source examined the effects of drinking non-alcoholic beer with hops at dinnertime. The researchers found that women who drank it showed improvements in their sleep quality. The participants also reported reduced levels of anxiety. Another study published in Acta Physiological HungaricaTrusted Source linked drinking non-alcoholic beer with hops to improved sleep quality among university students.

Why are hops combined with valerian?

While hops have shown promise for relieving anxiety and sleep disorders on their own, they might be even more effective when combined with an herb called valerian. This herb has a lot in common with hops. It also has a long history of use as an herbal treatment for insomnia.

According to a review article published in Australian Family Physician, some scientific evidence suggests that valerian can help improve sleep quality, when taken on its own or with hops. However, more research is needed.

While valerian can cause mild side effects, the National Center for Complementary and Integrative HealthTrusted Source notes it's generally safe to use for short periods of 4 to 6 weeks.

Can hops be used to treat other conditions?

On top of their sedative properties, hops also have estrogen-like characteristics. Like soy and flaxseed, they contain phytoestrogens. These plant-derived substances share many of the properties of estrogen. As such, scientists are also exploring the potential use of hops to treat menopausal symptoms.

For example, a study published in Planta Medica suggests that hops may help relieve some symptoms of menopause. But the authors note that more research is needed on the efficacy and safety of hops-based treatments.

Researchers in the British Journal of Nutrition suggest that hops may also help prevent obesity in mice that were on a long-term high fat diet. More research is needed on the effect of hops on obesity in humans.

What are the risks of using hops?

While hops are generally considered safe, you should always consult your doctor before trying a new dietary supplement. Hops may pose some risks of side effects, particularly for people with thyroid disease or estrogen-positive breast cancer. Researchers in the Dutch journal Nederlands Tijdschrift voor GeneeskundeTrusted Source also speculate hops-containing dietary supplements may raise the risk of postmenopausal bleeding.

It's also important to choose your source of hops wisely. If you decide to try taking hops for insomnia or other conditions, think twice before drinking an extra pint of beer at night. Drinking too much alcohol can actually lower your quality of sleep, even if it helps you fall asleep faster. It can also raise your risk of many chronic health conditions, including liver disease, heart disease, and certain kinds of cancer. Most studies on hops use either supplements or non-alcoholic beer containing hops.

Talk to your doctor if you think hops might help you sleep better at night. If you decide to take hops, get your fill from non-alcoholic sources that won't damage your liver.

Source:https://www.healthline.com/health/can-hops-get-me-to-sleep#risks

ALOE VERA WINE

ESHANT BHARDWAJ

Business Development Executive,
BECC

Aloe vera is one of the most fascinating medicinal plants and it has been studied by researchers all over the world. This plant has multiple therapeutic uses and it has been used for centuries for cosmetic and medicinal purposes. The Egyptians have been using it since 1500 B.C. to treat wounds, burns, infections and parasites. Even today, aloe vera is used successfully for the same conditions. The researchers say that aloe acts like a detoxifying and digestive agent for the body.

Aloe Vera Wine – Recipe No. 1 This medicinal wine is a unique source of vitamin B12 and other vitamins from the B-complex. It also contains minerals and healthy fatty acids. If you own an aloe vera plant, then you should not hesitate to prepare this amazing medicinal wine at home.

There are two recipes of the wine, as you will see below.

Ingredients

- 5 aloe vera leaves
- 2 kg of sugar
- ½ cup of raisins
- 1 teaspoon of yeast
- The juice from an orange or lemon
- 8 cups of water Preparation

Clean and wash the aloe vera leaves and cut them in small pieces. Put them in a large glass jar and mix them with the raisins, sugar and citrus juice. Furthermore, let the water boil and after that put it over the aloe mixture. Separately, dissolve the yeast in some warm water and pour it over the aloe mixture that has already cooled. Cover the jar and let the solution soak for 21 days. Shake the container regularly. Once the 21 days have passed, you can strain the wine and put it in a sterilized bottle.

Aloe Wine – Recipe No. 2

Ingredients –

- 1 kg of aloe leaves
- 2.5 kg of honey
- 3.5 liters of 14-18° red wine

Preparation

To prepare the aloe wine, you will need large aloe vera leaves, about 3 – 5 years old. If your aloe vera is in a flowerpot, then don't forget to water it 5 days before using it for the recipe. Mince the leaves, then mix them in a bowl with the honey and the red wine. Put the mixture in a large glass jar and close it tightly. Let the mixture soak for about 5 days in a cool and dark place.

Administration

So as to benefit from the aloe vera wine properties, you can follow a 2 – 3 weeks treatment. Don't take it more than 1 month. For the first week, you must take the solution thrice a day. Take 1 teaspoon of the wine 2 hours before every meal. For the next weeks, you will increase the dose and you'll take 1 teaspoon, 3 times per day, an hour before every meal.

The aloe vera wine will increase your appetite. During this treatment, your diet must be based on fruits, vegetables (raw or steamed), soups and grilled meat.

Indications

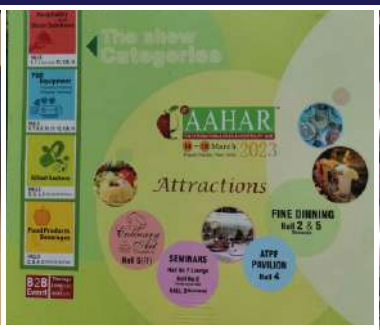
The aloe vera wine is beneficial for a wide array of conditions and ailments. Take it accordingly to the above mentioned indications.

It is useful for:

- Toothaches
- Digestive problems
- Headaches
- Detoxification and boosting the immunity
- Nervous fatigue
- Inflammations
- Mastoiditis
- Eczema and other skin conditions
- Asthma
- Rheumatism
- Flu
- Sclerosis
- Alcoholism
- Allergies

Source: https://topnaturalremedies.net/home-remedies/aloe-vera-wine-recipe-benefits/?fbclid=IwAR3nFCnBwDY6SqQpa46_GGM2B55ZNQWd2rrxhNEHTbCoYKhgADeM5ehGc5E

BECPL TEAM AT AAHAR
THE INTERNATIONAL FOOD & HOSPITALITY FAIR
FROM 14TH-18TH MARCH 2023



HOW TO OPEN A BOTTLE OF WINE

MAMTA BHARDWAJA

Business Development Manager
(Wine Industry)

How to store wine

We purchase different types of wines from different places for collection purposes. It is the great pleasure having your own collection of wine. Choosing and buying wine is one part, they also need to be stored properly. Also, it is useful to remember that not all wines are age-worthy, most wines are best enjoyed within a few years of release. While storing we need to take a few precautions.

Away from light

Any wine should store away from direct sunlight or artificial light. Because of UV light, wine becomes old before its time; also it acquires unwanted taste and smell. Many wine bottles are made up of tinted glass which gives UV protection. The glass contains special UV filters that prevent UV rays from penetrating the bottle. But still, there is a risk of exposure. That's why, always store wine bottles in dark.

Keep it cool

High temperature is an enemy of wine. At higher temperatures, wines begin to oxidize. Wine should be stored at a lower temperature that is below 24 degrees Celsius. The ideal temperature range for wine storage is 10 to 15 degree Celsius. Extreme cold and heat cause damage to the wine. Wine stored at lower temperatures slows down the process of aging, and premature aging can spoil the wine. The most important thing is the temperature fluctuation. It causes more damage than the warmer temperature.

Always store bottles on their side

A wine bottle that is sealed with cork must be stored on its side. This allows the wine to touch the cork. It keeps the cork moist and expanded; hence preventing it from becoming dry and fragile. It also blocks open pores of the cork and doesn't let too much air in that can spoil the wine. Wines that are sealed with screw caps can store standing up without any risk.

Avoid movements and vibrations

Avoid the movement of wine bottles from their place unnecessarily. Keep wine bottles in such a place that we do not need to move them. Move the bottles at the time of tasting only. The constant vibration or shaking can also adversely affect the wine's taste.

Maintain the Humidity

Corks need some humidity, neither too high nor too low. With low humidity, corks can dry out and if humidity is too high mold formation is encouraged. So, around 70% humidity is maintained.

Keep it alone

Never store wine with the thing with a strong smell, because wine is live liquid. Generally, all wines need breathing, and while breathing it acquires the smell of the surrounding through the cork. Due to this wine gets spoiled.

Cheers!!!
Mrs. Mamata Bhardwaja
Business Development Manager (Wine Industry)

BIOSIL®COLLOIDAL SILICA IN AGRICULTURE

Sachin Mogal

Technical Manager (Alcohol) ,
Balaji Enzyme and Chemical Pvt ltd

Less plant defects, less stress during plant growth, and a greater yield in less time

CHOOSING THE RIGHT COLLOIDAL SILICA

- *5 nm particle size*
- *Optimal balance between solubility and formulation stability*

NANO SILICA

Sodium stabilized

MULTIFUNCTIONAL

Soil and Foliar application

Biosil is alkaline, aqueous dispersion of colloidal silica that is approximately 15% solids by weight. The product is sodium stabilized and the amorphous silica particles carry a negative surface charge. The silica particles are discrete, have a smooth, spherical shape, and are present in a narrow particle size distribution.

BENEFITS OF BIOSIL® AS COLLOIDAL SILICA SI SOURCE

- Due to its small particle size, it is able to penetrate most substrates easily
- Due to its negative charge on the surface, it is able to bind with nutrients / minerals from soil or fertilizers
- Due to its solubility in water, it is able to act as a nutrients / minerals carrier from the ground to different parts of the plant
- Due to its small size, it gets deposited onto the plant cell wall . This provides good water retention within the plant / fruit.
- This also provides less stress for growth and more robust against mildew and bacteria attack
- Biosil increases the production of Cellulose (fiber) which makes the vegetables / fruits more crunchy

Biosil CS15-150 P is a versatile product that has many different applications and functions.
Examples: Sugarcane, wheat, pomegranate, cucumber, mango ,apple, paddy crops, vegetables

You can go for stone tiles in various color splashes, sheens, and shapes to get a kind of century-old touch. Warm, timeless Tuscan or Mediterranean colors offer reclaimed beauty.

If you are a fan of neutral effects, try stone pebble ideas.

ENZYMATIC ACTIVITY OF SOIL AFTER APPLICATIONS DISTILLERY STILLAGE

RAGHAVENDRA SHARAN SINGH

Sales & Technical Manager
(Alcohol Industry)

Introduction

Organic waste plays an increasingly important role in soil fertilization. Currently, due to the steady decline in the size of animal husbandry in Poland and a decrease in the amount of manure application, increasing opportunities are facing the use of organic waste produced by the agri-food industry. Distillery stillage is an example of such waste, which, under the Regulation of the Minister of Environment, Natural Resources, and Forestry of 24 December 1997, is classified as agri-food waste [1]. This interest in stillage waste is caused by the increasing number of distilleries and the related amount of waste produced. Distillery waste is one of the most polluting waste products due to its low pH, high temperature, and high content of organic matter [2].

Stillage is a by-product of a distillery obtained from the processing of starchy products, such as grains, potatoes, and molasses. It is produced with spirit by distilling fermented mash. The quantity and quality of the obtained distillery stillage are highly diverse, as it depends on the type and quality of the plant material it comes from, as well as on the course of the fermentation process, technology, and equipment used. The main raw materials used for the production of spirit in Polish distilleries are cereals (rye, wheat, maize) and potatoes. The most popular stillage is of grain origin, which accounts for ca. 74% of the total stock produced, and the least popular is molasses—accounting for 3.2% [3]. The surplus of stillage production is a problem for distilleries, which are forced to look for its recipients. Therefore, the possibility of using stillage for fertilization purposes deserves special attention. This has been successfully practiced for many years in Poland and other countries around the world [4–7]. Distillery stillage contains, along with organic carbon compounds, mineral nutrients essential for plants, which allows its use through the R10 recovery process—spreading on the soil surface to fertilize or improve the soil. They are characterized by a high content of potassium, calcium, magnesium, and sulfur. The common feature of stillages is the low phosphorus content compared to nitrogen and potassium and a relatively high content of organic carbon, mainly in the form of organic acids [4,9]. A limitation in the usage of stillage can also be its low pH. This waste is acidic and tends to be extremely acidic as fermentation progresses. Organic acids present in the stillage, responsible for the low pH, undergo biodegradation in soils, the end products of which are CO2 and H2O [10–12]. The disadvantage of distillery stillages is their high hydration, which means that when used for agricultural purposes they are often treated as wastewater. The use of stillage for fertilization can bring benefits to the agricultural sector, as it not only enables the recycling of minerals, but can also reduce the costs associated with the use of mineral fertilizers. The distillery stillage can improve the fertility of the soil by increasing its abundance in humus, nitrogen, and potassium, and reducing its acidification [13–15]. Gahlota et al. [16] reported that the improper use of stillage can adversely affect soil properties by lowering the level of plant nutrients or increasing soil salinity. Nandy et al. [17], on the other hand, observed an increase in the number of microorganisms after the application of rice stillage.

Despite the growing interest in stillage application, the processes and mechanisms of its long-term impact on the enzymatic activity of soil have not yet been sufficiently under-stood. Soil enzymes are a sensitive indicator used in the study of the relationship between plants and soil [18]. Enzymes are biological catalysts related to the cycle of macronutrients (C, N, P, S). The soil enzyme activity results provide information on biochemical processes. In the assessment of agricultural soil, in addition to physical and chemical parameters, the activity of selected enzymes, which have been recognized as indicators of soil quality, is determined [19]. The use of enzymatic activity as markers for the assessment of soil fertility enables the quantification of anthropogenic changes and allows for the monitoring and identification of trends occurring in the soil [18]. According to Kaur et al. [20] and Hassan et al. [21], the studied soil enzymes, participating in the circulation of nutrients in the soil, showed much higher activity with an increase in the concentration of the stillage used. The contradictory results of the research contributed to the analysis of the influence of rye stillage on the cultivation of winter triticale. The aim of the study was to determine the effect of the use of stillage under the cultivation of winter triticale cultivated in a long-term monoculture on the enzymatic activity of soil and its relations with selected chemical parameters during the three-year research period.

Materials and Methods:-

Location of Soil Sampling:-

The research areas were located in the intensively used agricultural region of the Kuyavian-Pomeranian Voivodeship (52 4900200 N 17 3402500 E). The area included in the analysis is located in the eastern part of the Chodziejski Lake District, located between the valley of the central Note´c River, and the valley of Wełna, the right tributary of the Warta River (north-central Poland). The area receives 512 mm of rainfall per year (mainly in the summer months) and the average annual temperature is 8.1–8.6 C. Luvisoils are the dominanting type of soils on the surveyed area [22]. In spring (April), pre-sowing fertilization was made in the quantity: P2O5 30 kg ha 1, K2O 50 kg ha 1, and N 30 kg ha 1. Soil samples were collected from surface mineral levels from depths of 0–20 cm and 20–40 cm. At each period, 40 soil samples were collected (20 soil samples in the depths 0–20 cm and 20 soil samples in the depths 20–40 cm. Soil samples were collected by the squares method from the plot of 2 ha. The average sample consisted of ten primary samples. The distillery stillage was applied in October 2018 at a dose of 40,000 L per hectare for the cultivation of winter triticale cv. 'Grenado' in monoculture. Soil samples were taken before the use of the stillage (control in 2018) and seasonally (spring, autumn) in the following two years (2019 and 2020) after applying the stillage as a fertilizer. The chemical composition of the studied distillery stillage produced during the processing of rye mainly is given in Table 1.

Table 1.Characteristics of distillery stillage

pH	N	P	K	Mg	Zn	Cu
3.8	2.56 gL^{-1}	1.38 gL^{-1}	12.6 gl^{-1}	1.95 mg L^{-1}	4.21 mg L^{-1}	0.76 mg L^{-1}

Soil Analysis:-

Chemical analyses were performed on air-dried and sieved samples (<2 mm). Each sample was analyzed in triplicate. In the properly prepared soil samples, the following parameters were assayed:
Soil pH in 1 M KCl [23].

Organic carbon (Corg) was determined using Tiurin's method by wet oxidation at 180 C with a mixture of potassium dichromate and sulfuric acid [24].

The granulometric composition with the laser diffraction method applying the Mas-terssizer MS 2000 analyzer.

The contents of available forms of phosphorus (P) [25] and potassium (K) were defined, by the Egner-Riehm method (DL) [26], as was the content of magnesium available to plants (Mg) following the Schachtschabel method [27].

The contents of easily available forms of heavy metals (Zn, Cu), DTPA-extracted (1 M diethylenetrianinepentaacetic acid) were also measured, according to Lindsay and Norvell [28]. The content of the available forms of Zn and Cu to soil was determined by atomic absorption spectroscopy using a Solaar S4 spectrometer. To verify the accuracy of the results, the analysis of the certified material Loam Soil No. ERM-CC141 and the so-called zero tests were carried out, which were exposed to the identical analytical procedure as the soil samples. Good comparability between the certified and determined values was obtained.

Enzyme Analysis:-

The activity of the surveyed enzymes was studied in fresh, humid, and sieved (<2 mm) soils that were stored at 40C for two weeks. Each activity test was repeated three times.

Dehydrogenases (DEH) activity was determined by Thalmann's method [29] after incubating the samples with 2,3,5-triphenyltetrazolium chloride and measuring the absorbance of triphenylformazane (TPF) at 546 nm and expressed as mg TPF kg 1 24 h 1.

The activity of alkaline phosphatase (AlP) and acidic phosphatase (AcP) in the soil was measured based on p-nitrophenol detection (pNP) produced after incubation (at 370C, for 1H) at pH~6.5 for AcP and pH~11.0 for AlP [30].

Results and Discussion

Table 2 presents the results of selected physical and chemical properties and enzymatic activity of the soil before the application of stillage. As the soil texture is a parameter that does not undergo seasonal changes, the content of the loam fraction is presented only in Table 2. It remained unchanged for the rest of the time. In the research of the granulometric composition, it was found that the analyzed soil samples showed similar grain size composition containing from 5.48% to 9.83% of the clay fraction (Table 2) and have been classified as sandy loam texture according to the USDA (United States Department of Agriculture) soil classification [32]. In terms of agrotechnical heaviness, they were classified as medium and heavy soils [33].

Table 2. Selected physicochemical and biochemical properties of the soil before the application of the distillery stillage (Control in 2018)

Parameters *	Depth (cm)	Min *	Max *	Me *	CV *
Clay	0–20	6.07	9.83	7.00	15.35
%	20–40	5.48	8.45	7.28	17.04
pH	0–20	4.42	6.37	5.83	11.78
	20–40	5.03	6.58	5.74	8.42
Corg	0–20	3.9	7.7	4.45	27.93
g kg^{-1}	20–40	1.30	5.25	3.00	40.24
P	0–20	5.59	67.80	15.30	84.62
mg kg^{-1}	20–40	0.18	14.98	4.35	96.00
K	0–20	100	243	148	23.85
mg kg^{-1}	20–40	65.75	102	95.40	14.50
Mg	0–20	68.94	98.52	74.99	80.28
mg kg^{-1}	20–40	40.22	68.23	56.75	16.19
Zn	0–20	1.63	3.44	2.59	19.12
mg kg^{-1}	20–40	1.07	3.79	1.41	55.42
Cu	0–20	0.86	2.22	1.73	28.85
mg kg^{-1}	20–40	0.90	5.83	1.89	69.09
AlP	0–20	0.35	1.01	0.57	33.49
mMpNP kg^{-1} h^{-1}	20–40	0.22	0.62	0.39	29.68
AcP	0–20	1.07	1.71	1.16	17.98
mMpNP $kg^{-1}h^{-1}$	20–40	0.76	1.45	1.04	21.88
DEH	0–20	0.99	1.23	1.11	6.84
mgTPF kg^{-1} 24 h^{-1}	20–40	0.52	0.96	0.74	22.13

* Corg—organic carbon; P—available phosphorus; K—available potassium; Mg available magnesium; Zn— available zinc; Cu—available cooper; AlP—alkaline phosphatase; AcP—acid phosphatase; DEH dehydrogenases; Min—minimum; Max—maximum; Me—median; CV—coefficient of variation.

Conclusions:-

The results obtained from the three-year experiment showed that fertilization with distillery stillage had a positive effect on soil properties. The acidic pH of the stillage had little effect on lowering the pH of the studied soil. However, systematic monitoring and regulation of soil pH are necessary. The use of stillage as fertilizer had a significant effect on the content of organic carbon in the analyzed soil. As for P, K, and Mg, their content increased during the research and in both soil levels studied. The average content of available macronutrients allowed us to classify the soil into the 3rd class of fertility. Therefore, it is advisable to use mineral fertilization simultaneously. The activity of the tested enzymes increased after the application of rye stillage, which underlines its positive effect on soil fertility. The use of distillery stillage favors the recycling of minerals in the agricultural sector, which, in turn, brings environmental benefits and may contribute to the reduction in costs related to the application of mineral fertilizers.

References:-

1. Regulation of the Minister of Environmental Protection, Natural Resources and Forestry of 24 december 1997 on the classification of waste. J. Laws 1997. No. 162, item 1135.

2. Zielinska, M.; Bułkowska, K.; Mikucka, W. Valorization of Distillery Stillage for Bioenergy Production: A Review. Energies 2021, 14, 7235. [CrossRef].

3. Szulc, W.; Rutkowska, B.; Łab ˛etowicz, J.; Gutowska, A. Distiller slops—Wastage whether the organic fertilizer? Adv. Agric. Sci. Probl. Iss. 2009, 535, 423–433.

4. Bustamante, M.A.; Perez-Murcia, M.D.; Paredes, C.; Mora, L.R.; Perez-Espinosa, A.; Moreno-Caselles, J. Short-term carbon and nitrogen mineralisation in soil amended with winery and distillery organic wastes. Bioresour. Technol. 2007, 98, 3269–3277. [CrossRef] [PubMed].

5. Skowro ´nska, M.; Filipek, T. Fertilizing use of stillage. Proc. Ecopole 2012, 6, 1–5. [CrossRef].

चीनी उद्योग एवं गन्ना किसानों पर एकमात्र हिन्दी मासिक पत्रिका

शुगर टाइम्स
SUGAR TIMES

(सदस्यता फार्म)/SUBSCRIPTION FORM

सेवा में,
सम्पादक
485, ममफोर्डगंज, प्रयागराज-211002
फोन/फैक्स : 9415305911, 7355453462
E-Mail : info@sugartimes.co.in

Date -
Member No.-
Valid Upto -

Follow us on @TheSugarTimes

प्रिय महोदय,

मैं शुगर टाइम्स की सदस्यता प्राप्त करने का इच्छुक हूँ।

Pls. Tick	Period	Courier/Regd. Post	E-Magazine
☐	One Year	Rs. 2000/-	Rs. 1000/-
☐	Two Year	Rs. 3600/-	Rs. 1600/-
☐	Three Year	Rs. 5000/-	Rs. 2000/-
☐	Life Membership	Rs. 15,000/-	Rs. 8000/-

मैं अपनी राशि Cash ☐ Cheque ☐ Online ☐
SUGAR TIMES के नाम Payable at Allahabad भुगतान कर रहा हूँ।
For online Subscription Login to **sugartimes.co.in/subscribe** पर कर सकते हैं।

Our Banker Name : UCO Bank, Branch - Mumfordganj, Prayagraj
Current A/C No. **16110210000861**, IFSC Code - **UCBA0001611**

Name _____ Desig _____
Address _____
_____ Pin _____
E-mail _____
Mobile _____ Date of Birth _____
Cash/Cheque/RTGS No. _____ Dated _____

UPI ID-**8756062435@okbizaxis**

Signature

पत्रिका कोरियर/डाक द्वारा भेजी जाएगी, अतः कृपया पूरा पता लिखें।

To keep yourself abreast with the latest in Alcohol

SUBSCRIBE NOW

Hindi Monthly News Magazine on Excise, Alcohol and Prohibition

Aabkari Times is a first Hindi monthly news magazine on alcohol, sugar and prohibition being published from Allahabad since 2009. The editorial team has retired excise and sugar dept. official. This magazine covers different articles and news on govt. policies related to sugar, alcohol, ethanol.

Period	Courier/Regd.Post	E-Magazine
One Year	Rs. 1500/-	Rs. 1000/-
Two Year	Rs. 2800/-	Rs. 1600/-
Three Year	Rs. 4000/-	Rs. 2000/-
Life Membership	Rs. 15,000/-	Rs. 8,000/-

Our Mission Excise, Alcohol & Prohibition

AABKARI TIMES

485, Mumfordganj, Prayagraj - 211 002
Ph./Fax : 0532-2440267, Mob. - 073797 00003
E-mail : aabkaritimes@gmail.com

To Subscribe sms AT - 73797 00003

WINE REPORT

KANCHAN SINGH

Chapter Head - South Delhi, India
Apex Wine Club India

1 March 2023, Wednesday

India has signed a trade agreement with Australia under which Australian wine priced at US$15 per bottle or more has had the 150 per cent tariff reduced to 75 per cent. This will reduce annually over 10 years with a final tariff rate of 25 per cent.

Besides, tariffs on wine priced between US$5-15 have fallen to 100 per cent and will decrease to 50 per cent after 10 years.

This development is an opportunity for Australian wine in the premium segment. For instance, South Australia's Torbreck Vinters is an exporter which has benefitted from the competitive advantage which tariff reductions will provide. The end price of its premium Barossa wines dropped 8 per cent which makes Torbreck more accessible to Indian consumers.

Australian producers need to visit India for an assessment of the infrastructure, retail outlets and regulatory environment, and build personal connections with importers and other industry stakeholders.

BALAJI ENZYME & CHEMICAL PVT LTD

Akshay Mittal Industrial Estate
A-113, 1st Floor, Building No 5, Sir M V Road, Andheri (East),
Mumbai - 400059 | +91-22-460 31 666
E-mail : info@becpl.in | Web. : www.becpl.in