

Catalysts

connect

Oct-Nov-Dec-Jan'19 Volume 31

16th
Anniversary

Do You Know About MOLASSES?

No-Alcohol Beer (NAB) Low-Alcohol Beer (LAB)-Prospect

The EVOLVING ROLE of WOMEN'S CONTRIBUTIONS to BREWING BEER

Novel Enzyme from Tiny Gribble A Boon for Biofuel Research

COMPLETE ENZYME & ADDITIVES SOLUTION FOR BREWING INDUSTRY

CHANNEL
PARTNERS

CENTRAL
INDIA



MECON CHEMICALS
MATRIX CORPORATION

NEPAL

Dakali
Industrial Marketing Pte. Ltd.

ENZYMES & ADDITIVES IN BREWING

- Enzymes and Additives in Mashing
- Enzymes and Additives in Fermentation
- Enzymes and Additives in Filtration
- Enzymes and Additives in Maturation

FEATURES

- Customized Solutions
- Trademark Products
- On Demand Analytical Support
- Well Equipped & State-of-Art Labs
- Leaders in Enzyme Solutions for Sugar & Ethanol Industry
- Certified Manufacturing Units
- More than a decade of Excellence
- Qualified Customer Support Teams

ABOUT THE GROUP

The Catalysts Group is among the top 5 Indian biotechnology companies, active in industrial enzymes business segment.

Our 15+ years experience of enzyme application in sugar as well as alcohol industries have given us a distinctive edge in creating customized products. Application of our products not only increases process efficiency, but also results in higher ethanol recovery.

ISO 9001:2015
& FSSC 22000
Certified by
Intertek

fssai



K
LBD

For more information,
contact us at info@thecatalystsgroup.com
or call at +91 11 49867313 / 49867314


Catalysts
making things happen...

Contents

Editorial

- 01** Message from the Managing Director
- 02** Message from the Director

Cover Story

- 03-04** Aaghaz - 16th Anniversary

Features

- 05-06** Novel Enzyme from Tiny Gribble : A Boon for Biofuel Research
- 07-09** No-Alcohol Beer (NAB) Low-Alcohol Beer (LAB)-Prospect
- 10-13** Do You Know About MOLASSES??
- 14-19** The evolving role of women's contributions To brewing beer

Inspirational

- 20-21** One always has Enough time, If one will Apply it well

Employees Zone

- 22** Diwali & Christmas Celebration
- 23** Welcome New Joinees

CONTRIBUTORS



Joole Chauhan
R&D Department



Dr. Archana Prakash
R&D Department



Akshat Jian
BD Department



Bijay Bahadur
GM. Yuksom Brewery



Florencia Joseph
HR Department



MESSAGE FROM THE **MANAGING DIRECTOR**

Dear Friends

The New Year 2019 has arrived with a new bunch of opportunities for all of us and we as Catalysts being true to our tradition have welcomed this year with continued Growth in all departments. We have been growing @ 30% Y.O.Y. in our revenues in this financial year. We have been breaking many records in our growth story in this financial year. All our industry verticals Grain Alcohol, Molasses Alcohol, Sugar and Brewing are witnessing tremendous growth. Our production facilities are operating at all time high capacities and thanks to our excellent Production and Supply chain teams, we are exceeding all expectations of our clients on time.

We celebrated our 16th anniversary with welcoming families of all the members of Catalysts Group at Pratapgarh Farms for a picnic, which was truly an amazing experience. We thank all family members for their enthusiasm and participation to make this event memorable.

India is now the fastest growing big economy in whole world and thanks to the favorable government policies for Industry sectors we are catering, growth opportunity for Catalysts is phenomenal. Many new factories for producing Ethanol are coming up and current factories are also expanding. Our highly motivated Business Development team along with our Principals and channel partners are fully geared up to tap this opportunity.

Just couple of months left in this financial year, this is a time to stay focused on achieving set targets for this year and plan for next financial year. Best of luck to everyone...

Munish Madaan



MESSAGE FROM

THE DIRECTOR

Dear Friends

Happy new year to you all.

I hope you celebrated the start of 2019 in good spirits with family and friends. Now that we're a few days into the new year, it's good to look ahead and think about what this year may bring us.

But first, a quick look back.

2018 was quite a year for all of us at Catalysts. We have been growing by approx 30% YoY. We've been through many developments in our products basket for existing verticals. Our yeast Ethanol Red for grain fermentation has already reached the leadership position. Our microbrewery business is making a good progress. Products for molasses fermentation are making noise beyond the Indian subcontinent. Catalysts R&D labs have been NABL & DSIR certified.

In 2019, Catalysts Group will keep its strong feet in Agriculture & Animal Nutrition. We will be offering more cost effective solutions in CIP and for microbial control during fermentation. We are gearing up to establish our dominance in Malt Spirit arena. Protein Ingredients would be a new industry where Catalysts Group would be making its mark this year.

The current circumstances are all quite challenging to work in. But doesn't matter what the circumstances are, we must not lose sight of our priority: to be strong, focused and to be a financially sustainable company that puts the customer at the heart of everything we do.

Showing our customers how we can support them in their process needs, by providing technical support when needed, flexibility where possible and a range of clear and simple products.

I would like to thank you all for your significant support and dedication during these challenging times. The year ahead will bring its own challenges but I'm sure by working together, keeping focused on our priorities and putting our customers first we can realise our ambitions.

These will certainly continue to be our priorities at Catalysts and I am convinced together we can "Make things happen".

A handwritten signature in black ink, appearing to read 'Aditya Malhotra'.

Aditya Malhotra

AAGHAZ - 16th Anniversary





Novel Enzyme from Tiny Gribble : A Boon for Biofuel Research

Dr. Archana Prakash – R&D Dept.



Tiny wood borers known colloquially as gribbles make their own enzymes and use them to eat through docks in harbor towns, earning enmity from fishermen all around the world. Gribbles (Scientific name: *Limnoria quadripunctata*) are 1 to 3 millimeters long and have an organ called the hepatopancreas that extends almost the entire length of their bodies. This organ is where gribbles make their own enzymes. In other words, they don't rely, as termites, cows, and humans do, on the organisms that find their way into their stomachs to aid in digesting the food they eat.

Interestingly, several of the enzymes produced by gribbles are in the same important enzyme classes that are typically harvested from fungi in the biosphere for industrially deconstructing the cellulose in biomass. The gribble enzymes hold promise of tolerating salts much better, likely due to the fact they evolved in a marine environment. This unique adaptation may have beneficial implications for the ability of the gribble enzymes to more efficiently operate in a high-solids, industrial environment, breaking biomass down more effectively into sugars, which can then be converted into ethanol or a hydrocarbon fuel to replace gasoline, diesel, or jet fuel.

Using advanced biochemical analysis and X-ray imaging techniques, researchers determined the structure and function of a key enzyme used by gribble to break down wood. The biofuels industry needs tough, efficient enzymes that are tolerant of industrial processes. For biochemical conversion with enzymes,

industry needs to push up to very high solids, with very little water around and discovery of this Gribble enzyme Cel7 structure reveals new evolutionary adaptations that may suggest mechanisms for producing more robust, industrial enzymes for high-solids loadings environments can help the researchers to reproduce the enzymes effects on an industrial scale in a bid to create sustainable liquid biofuels.

Generation of liquid fuel from woody biomass, such as wood and straw, the polysaccharides (sugar polymers) that make up the bulk of these materials have to be broken down into simple sugars. These are then fermented to produce liquid biofuels. This is a difficult process and making biofuels in this way is currently too expensive. Gribble are of interest as they are voracious consumers of wood and have all the enzymes needed for its digestion. The enzymes attach to a long chain of complex sugars and chop off small soluble molecules that can be easily digested or fermented. This novel Gribbles enzyme can break down of biomass (cellulose) directly into sugars even in harsh environments might become the great thing about gribbles, as the industry searches for enzymes that can thrive in salt-rich, high-solids settings. Researchers from the Energy Department's National Renewable Energy Laboratory (NREL) and elsewhere are exploring whether that curse can be turned into a blessing for the biofuels industry.

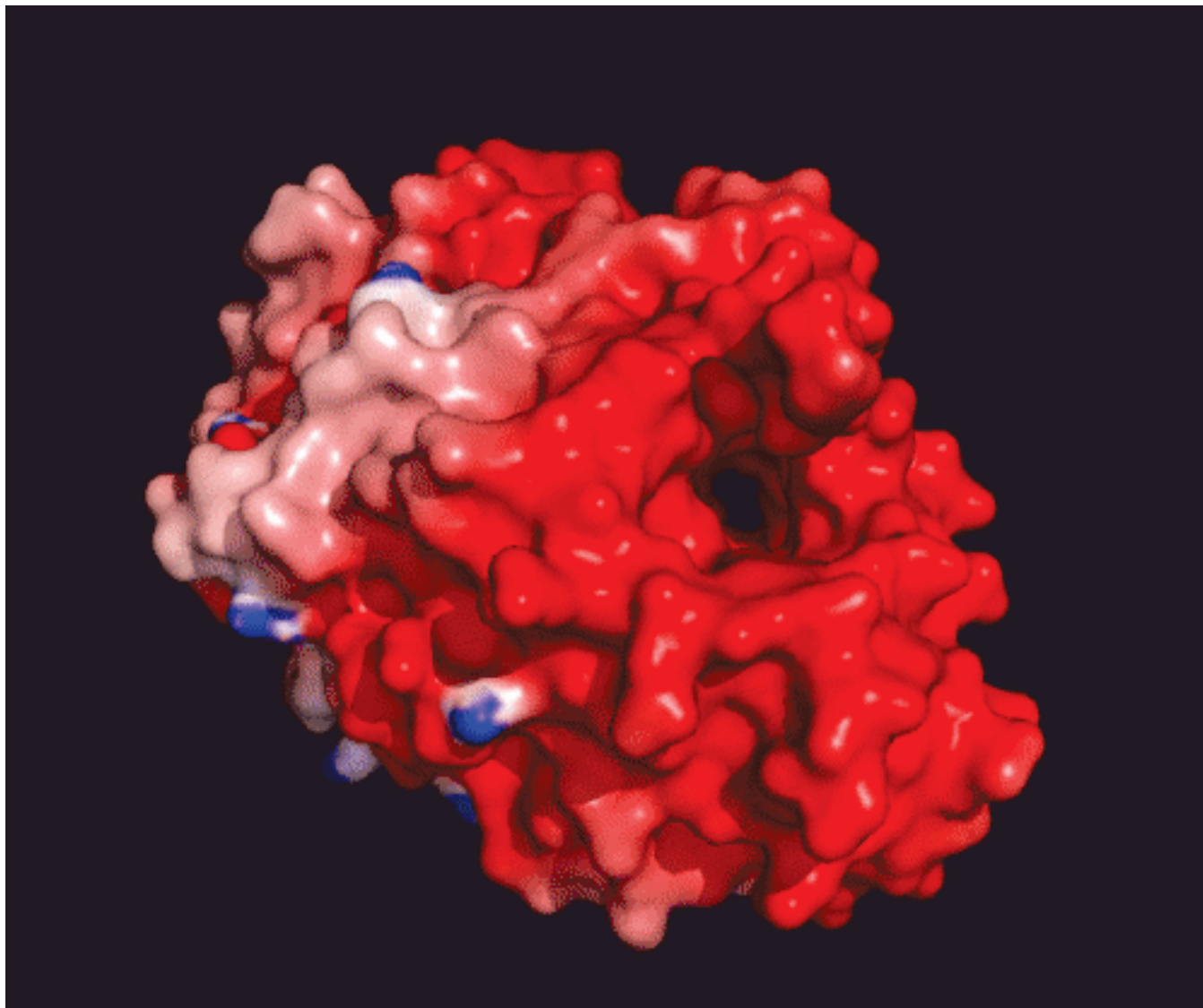


Figure: The 3-D structure shows the tunnel where the enzyme feeds in the cellulose chains for digestion. The red color represents the highly acidic surface that allows it to be stable and active in very high salt condition

Basically, enzymes are proteins that serve as catalysts, in this case one that degrades cellulose. This enzyme looks superficially similar to equivalent ones from fungi, closer inspection highlights structural differences that give it special features, for example, the enzyme has an extremely acidic surface and researchers believe that this is one of the features that contributes to its robustness. Genetic blueprint of this enzyme have been recognized for the development of industrial microbe that can

produce it in large quantities, in the same way that enzymes for biological washing detergents are made. By doing this they hope to cut the costs of turning woody materials into biofuels. The robust nature of the enzymes makes it compatible for use in conjunction with sea water, which would lower the costs of processing. Lowering the cost of enzymes is seen as critical for making biofuels from woody materials cost effective. Its robustness would also give the enzymes a longer working life and allow it to be recovered and reused during processing.

Source: BBSRC Sustainable Bioenergy Centre (BSBEC) UK and U.S. Department of Energy's National Renewable Energy Laboratory (NREL)



No-Alcohol Beer (NAB) Low-Alcohol Beer (LAB) – Prospect

Bijay Bahadur Singh, Yuksom Breweries Limited (Sikkim)

Consumer Trends

Beer is a universally popular beverage, consumed worldwide. No one can deny that beer industry has changed drastically over the last three decades both in consumer preferences and production methods.

In addition to increased competitions, there have also been changes in legislation, the lowering of trade barriers and new processing techniques that breweries need to make themselves familiar with in order to remain as competitive as possible.

It is easy to observe that there is an increasing trend in brewing industry in low alcohol beer. There are several reasons that are causing this trend and these include:

- General health concern
- Religious reasons
- Excise duty and
- Stricter drink driving laws

Although reduced alcohol beer was not considered as “real beer” in the past, techniques for their production have changed, allowing low alcohol beers to finally be considered as serious alternatives to their full-strength counterparts.

In fact, in some countries low alcohol beer have been the fastest growing sectors of the alcoholic beverages market. The reason for this is simple. People enjoy having a beer with lunch, but don't want that sleepy feeling when they return to work. More importantly they want something that tastes like full strength beer and don't just look like it.

Nowadays, it has been observed that no-alcohol (alcohol-free) and low-alcohol beer is on the rise due to several reasons. What will be the impact of the increasing popularity of these products has on the consumption of alcoholic beverages – a big question? There is concern that breweries with no-alcohol (alcohol-free) products are less ashamed of brand advertising. More advertising for the no-alcohol and low-alcohol brands will be created. This category is very attractive from a margin perspective owing to both its higher than average revenue and lower excise.

People become more aware with the problems that alcohol brings to the society, and choose to have a healthier lifestyle, by decreasing alcohol intake. On the

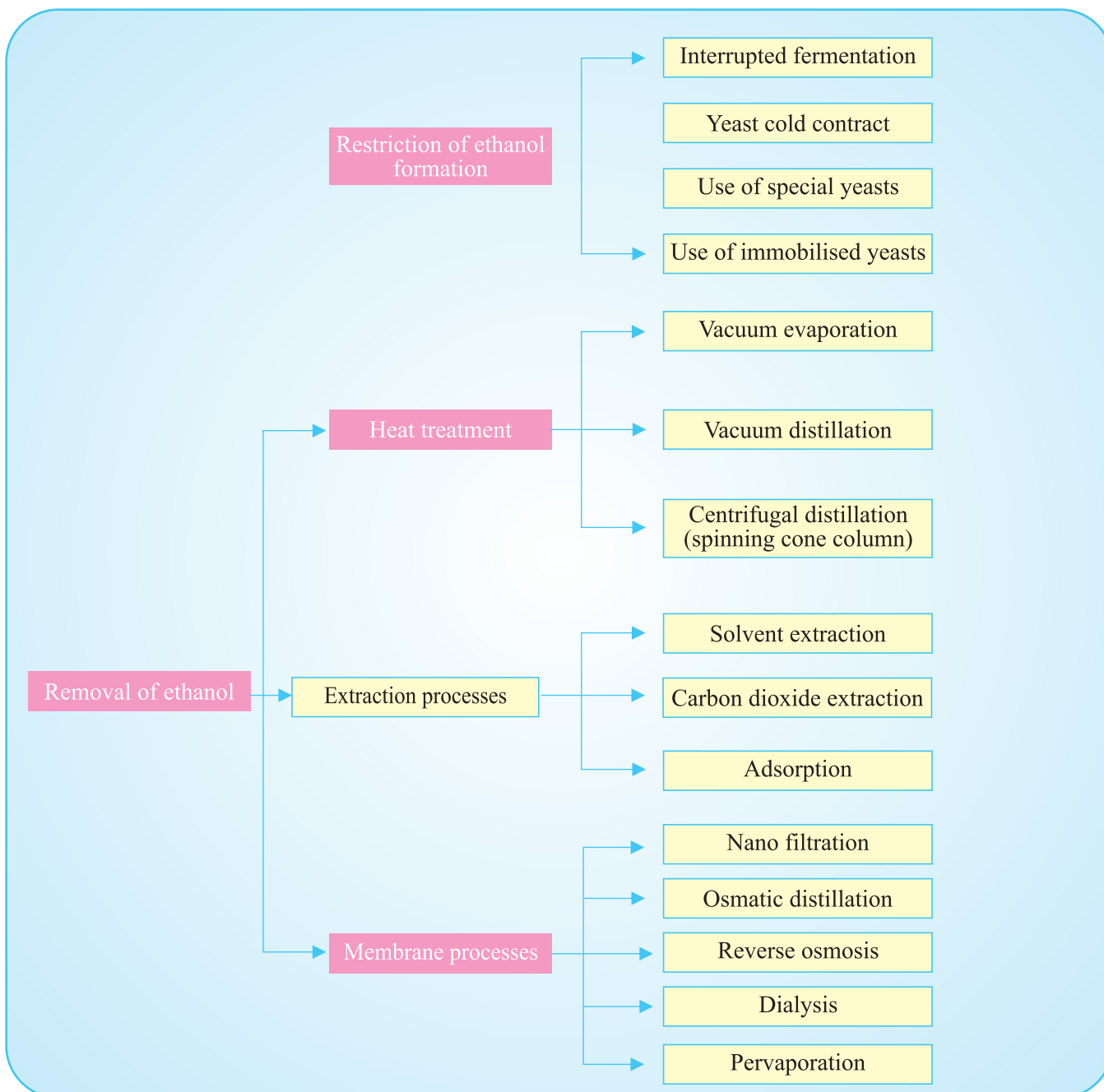
People become more aware with the problems that alcohol brings to the society, and choose to have a healthier lifestyle, by decreasing alcohol intake. On the other hand, imposition of prohibition of alcohol, the increasing restrictive drinking/driving rules lead to consumers being more conscious. Finally, there are other reasons such as religion, abstinence or pregnancy that explain that trend. Therefore, brewers should give increased emphasis on this category and explore the possibilities of improved technological solutions for producing no-alcohol or low alcohol beer with satisfactory organoleptic characteristics that can be compared with conventional beers.

Production of non-alcoholic beers

Usually, the processes for producing no-alcohol or low-alcohol beer are divided in two major categories:

- Restriction of Ethanol Formation Processes
- Ethanol Removal Processes

Figure-1, sketches the most popular methods for producing no-alcohol or low-alcohol beer.



Recovery of beer flavour compounds

The recovery of beer aroma compounds plays an important role during the production of non-alcoholic beer, since most of the above-mentioned processes for producing alcohol free beers result in a product whose aroma profile is unpleasant or distinct compared to the homologue alcoholic beer.

The recovery of natural beer compounds can be achieved by:

- I) Removing the lost aroma compounds, through side streams of the dealcoholization system;)
- II) Extracting the aroma compounds directly from the original beer, before being submitted to dealcoholization.

Membrane processes seem to be the best approach to recover beer aroma compounds lost during ethanol removal. These separation processes have additional advantages when compared with traditional separation processes:

1. Operation costs of membrane-based processes are usually low.
2. Can be carried out at low temperatures.
3. Do not need chemical additives, such as solvents or absorbents.

Pervaporation as a promising process for beer aroma recovery

As mentioned before, pervaporation (PV) is a membrane separation process based on cross-flow filtration, in which a feed liquid mixture contacts with a non-porous membrane and some of the feed compounds preferentially permeate through it. Vacuum is applied to the permeate side allowing the permeating species to leave the membrane in the vapour phase.

Nowadays, an increasing trend in the use of pervaporation for recovering aroma compounds in food applications, especially in the recovery and enrichment of aroma compounds from fruit juices as well as from fermented beverages, such as beer or wine.

Key beer aroma compounds

The most distinguishing aroma compounds are formed during beer maturation and are characteristic of a finished beer. These aroma compounds belong to two main chemical groups, *higher alcohols* and *esters*, and their concentration has a great impact on beer organoleptic quality.

The disadvantage of the dealcoholization processes is the loss of important aroma compounds. For overcoming the

loss of aroma compounds, it was proposed to recover them by pervaporation before beer being submitted to dealcoholization and adding them to the dealcoholized beer. The pervaporation extraction of beer aroma compounds, such as higher alcohols and esters. The process proved to produce a very successful beer with a balanced aroma profile, similar to the original one.

Conclusions

In recent years, there has been an increased market share for no-alcohol and low alcohol beers. This is mainly due to the health reasons (such as obesity and other issues associated with high alcohol consumption), safety reasons (in the workplace or traffic roads) and increasingly strict social regulations and also the fact that alcohol consumption is forbidden in few countries because of religion as well as the awareness of problems that alcohol can bring about regarding civil responsibilities. No alcohol beers are recommended for specific groups of people such as pregnant women, sporting professionals, people with cardiovascular and hepatic pathologies, and medicated people. Consumers in such conditions are willing to have a beer as close to the conventional types as possible, from sensory point of view, a goal that is very difficult to achieve, because these beers suffer from having an artificial and immature flavour as well as inappropriate body and foam head. For these reasons, no-alcohol and low alcohol beverages have drawn social, technological, and economical interests. A variety of methods have been proposed and practiced for industrial production of no-alcohol and low alcohol beers with acceptable organoleptic properties.

Beer exerts various healthful effects on the human body due to its different constituents. However, consumption of no-alcohol beers does not provide the healthful effects of alcohol intake (in low amounts) as is the case with normal or low alcohol beers. On the other hand, it does not comprise adverse impacts of high alcohol intake caused by indiscriminate consumption of high-alcohol-containing beers. When consumed at moderate levels, low alcohol beers can be a good alternative to the regular alcoholic beers from the health point of view.

The beer giant sees more consumers looking for alternatives to traditional beers, that are light, refreshing, and in-synchronization with active lifestyles, adding that no-alcohol and low-alcohol beer (NAB/LAB) category is likely to grow significantly in the next decade.

Do You Know About MOLASSES??

Joole Chauhan, R&D Department

About Molasses

Molasses, meaning honey like, is a thick dark syrup that is a by-product of sugar refining through repeated crystallization of sugar syrup obtained by crushing sugar cane. In India Molasses is used mainly in manufacture of industrial/ potable alcohol, yeast and cattle feed. Alcohol in turn is used to produce ethanol, rectified spirit and various value added chemicals. Ethanol is consumed by chemical industry and is also used in blending with petroleum to produce Ethanol Blended Petroleum (EBP). The yield of molasses per ton of sugar cane crushed varies in the range of 4.5% and 5%. Molasses and industrial alcohol - based industries were decontrolled in 1993 and are now being controlled by respective state government policies.

How Molasses Is Made?

The most common forms of molasses are made from either sugar cane or sugar beet juice which is boiled down to a syrup. Sugar crystals are extracted from the syrup, and the remaining dark liquid is molasses. Molasses can also be made from sorghum, pomegranate, carob, and dates.

Types of Molasses

There are several varieties of this syrup, which vary in color, consistency, flavor and sugar content.

A Molasses (first Molasses, Light Molasses)

This is the syrup made from the first boiling. It is the lightest in color and sweetest in taste.

B Molasses (second Molasses, Dark Molasses)

Mineral Elements in Molasses

| Parameter | As fed | On DM | Unit | Other | Unit |
|---------------------------------|--------|-------|--------|-------|------|
| Calcium | 6.6 | 9.1 | g/kg | - | - |
| Phosphorus | 0.50 | .7 | g/kg | - | - |
| Phytate phosphorus | 0.05 | 0.07 | g/kg | 10% | P |
| Magnesium | 3.14 | .3 | g/kg | - | - |
| Potassium | 35.7 | 49.3 | g/kg | - | - |
| Sodium | 1.79 | 2.47 | g/kg | - | - |
| Chlorine | 15.7 | 21.7 | g/kg | - | - |
| Sulfur | 5.2 | 7.2 | g/kg | - | - |
| Dietary cation-anion difference | 225 | 311 | mEq/kg | - | - |
| Electrolyte balance | 550 | 761 | mEq/kg | - | - |
| Manganese | 53 | 74 | mg/kg | - | - |
| Zinc | 13 | 18a | mg/kg | - | - |
| Copper | 5 | 6 | mg/kg | - | - |
| Iron | 125 | 173 | mg/kg | - | - |
| Cobalt | 0.9 | 1 | mg/kg | - | - |
| Molybdenum | 1 | 2 | mg/kg | - | - |
| Iodine | 4 | 6 | mg/kg | - | - |

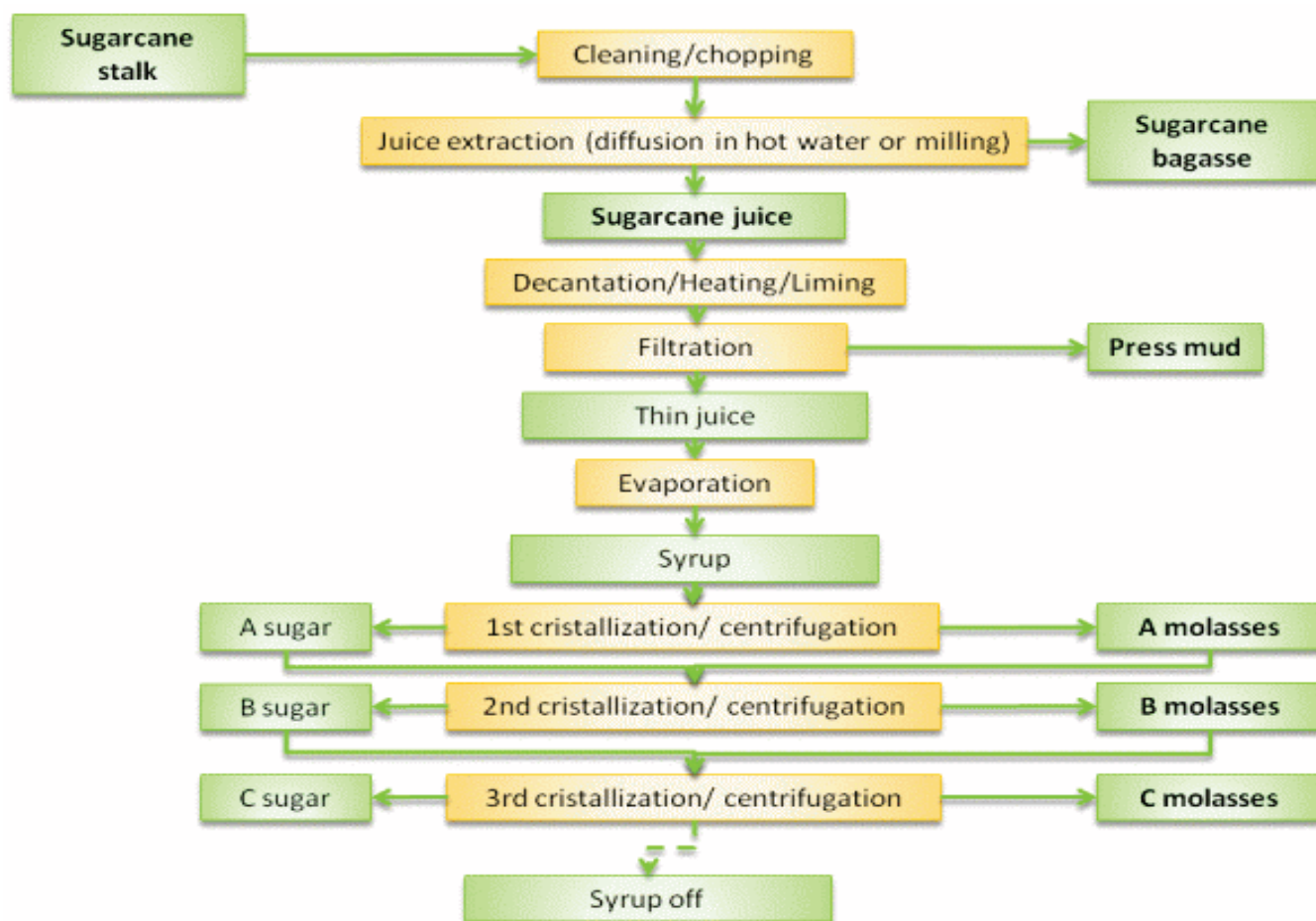
This is the type created from the second boiling. It's thicker, darker and less sweet.

C Molasses (final Molasses, blackstrap Molasses, treacle)

This is the syrup produced after the third boiling. It is the thickest and darkest in color, and also tends to have a bitter taste. Blackstrap molasses is the most concentrated form and contains the most vitamins and minerals. For that reason, it is said to have the most health benefits.

Un-Sulfured and Sulfured

Molasses labeled as "sulfured" has sulfur dioxide added to it. Sulfur dioxide acts as a preservative and prevents it from spoiling. Sulfured varieties tend to be less sweet than un-sulfured products.



Nutrition

Unlike refined sugar, molasses also contains some vitamins and minerals.

Here are the nutrients you can find in 40 grams, or about two tablespoons:

- **Vitamin B6** : 14% of the RDI.
- **Calcium** : 8% of the RDI.
- **Potassium** : 16% of the RDI.
- **Copper** : 10% of the RDI.
- **Iron** : 10% of the RDI.
- **Magnesium** : 24% of the RDI.
- **Manganese** : 30% of the RDI.
- **Selenium** : 10% of the RDI.

Two tablespoons also contain about 116 calories, all of which come from carbs - mostly sugar. So even though it contains vitamins and minerals, remember that it's also very high in sugar. Sugar can be very harmful to your health when consumed in excess. Excess sugar intake has been linked to some of the world's biggest health

problems, including obesity, type 2 diabetes and heart disease.

Due to its high sugar content, do not add molasses to your diet just for the nutrients. The best way to get these nutrients is by eating whole foods. However, if you are going to eat sugar anyway, then this is certainly a healthier alternative.

Health Benefits of Molasses

Some say it may even offer unique health benefits. There is limited research available about the health effects of molasses. However, the nutrients in it have been linked to several health benefits.

Bone Health: This syrup contains a decent amount of calcium, which plays an important role in bone health and preventing osteoporosis. It is also a good source of copper, iron and selenium, all of which help maintain healthy bones.

Heart Health: Molasses is a good source of potassium, which promotes normal blood pressure and helps maintain heart health. Although this has yet to be studied

in humans, rat studies have shown that supplementing with molasses can help increase HDL or "good" cholesterol. Healthy levels of HDL cholesterol may protect against heart disease and stroke.

Increases Red Blood Cell Formation: Molasses is rich in copper, which aids in eradicating free radicals from the body. It helps in the absorption of iron, the formation of red blood cells and maintains a healthy immune system. A deficiency of copper can result in anemia, thyroid problems, cardiac arrhythmia, and osteoporosis.

Maintains Hemoglobin Levels: The iron content in molasses helps maintain healthy levels of hemoglobin. Hemoglobin plays a key role in supplying oxygen from lungs to other parts of the body. It is also vital for the production of energy and aids in boosting the metabolism.


Maintains Healthy Nervous System: Molasses contains magnesium, which helps in the functioning of the nervous system. It relaxes our nerves and blood

vessels by balancing calcium volume and blocking it from rushing into the nerves. Unblocked and speedy flows of calcium into the nerves can over-activate them and lead to the transmission of too many signals and excessive nerve contraction. A deficiency of magnesium in the body can lead to hypertension, muscle cramps, spasms, and general body fatigue.

Treats Cancer: Apart from several vitamins and minerals, blackstrap molasses also contains selenium, which is beneficial in the treatment of cancer.

Prevents Hypokalemia: Molasses contains the essential mineral potassium, which is required for the proper functioning of cells. It helps in maintaining the acid-base balance of the body and prevents heat exhaustion. Potassium also plays an important role in nerve and muscle contraction and helps to maintain cardiac health. Adequate intake of potassium-rich foods like molasses helps prevent disorders like hypokalemia and reduces blood pressure as well.


HEALTH BENEFITS OF MOLASSES



Effective in reducing obesity

Relieves menstrual cramps

Maintains healthy bones and teeth



Helps in stabilizing blood sugar levels

Beneficial in treatment of cancer

Protects from cardiovascular disorders

Caution: Some people may develop allergic reactions due to sensitivity towards sulfite that is present in sulfured molasses.

www.organicfacts.net

Prevents Menstrual Cramps: Molasses is a good source of iron and is very effective for menstruating women who are at major risk of iron deficiency due to blood loss. With no fat and very few calories, it is a better alternative for contributing iron to the body as compared to other fatty sources like red meat. Iron prevents various disorders like menorrhagia which causes excessive blood flow for a longer duration during menstruation. The minerals such as magnesium and calcium present in

it help prevent the clotting of blood, relieve menstrual cramps, and maintain the health of uterine muscles. It is a healthy alternative, as compared to other medications for menstrual discomfort which might have certain side effects.

Hair conditioning: There are a number of surprising reasons your hair can turn gray, and some reports suggest molasses could possibly give you a weapon with which you can fight back against color change. According to

FEATURES

natural health experts, those who drink one to two tablespoons of blackstrap molasses diluted in water may see an increase in their hair health. Additionally, experts recommend making your own molasses conditioner, mixing water and molasses and leaving it on the hair for 15 minutes. It's thought that the anti-aging antioxidants found in molasses work as a conditioner, reversing graying of the hair and hair loss.

Blood Sugar: Molasses may also help stabilize blood sugar levels in healthy adults. People with diabetes may want to choose a low-calorie sweetener like stevia or erythritol.

One study found that eating it along with carb-containing foods resulted in lower blood sugar and insulin levels than when the foods were eaten alone.

Antioxidants: According to research, blackstrap molasses contains even more antioxidants than honey, as well as other natural sweeteners like maple syrup and agave nectar. Studies also show that the antioxidants in it can help protect cells from the oxidative stress associated with cancer and other diseases.

Side effects: Molasses is safe for most people when consumed in moderation.

Never the less, while it can be a good alternative to refined sugar, an excess intake of any added sugar can have negative health effects. People with diabetes may also want to avoid it. Additionally, molasses can cause digestive problems. Consuming large amounts can cause loose stools or diarrhea. If you have irritable bowel syndrome (IBS) or experience digestive discomfort, you may want to avoid this syrup.

Molasses has a wide variety of uses: It's a common ingredient in cooking, especially in cakes, cookies and other desserts. Molasses is also used in the production of ethyl alcohol and as an additive in livestock feed.

Molasses vs. sugar: Molasses is a sweetener that is claimed to be much healthier than sugar. Molasses contains several important nutrients and antioxidants, making it a better option than refined sugar. However, it's still very high in sugar, which can be harmful when consumed in excess.

- If you are thinking to use Molasses as food, it is available to purchase in health food stores & online.





The EVOLVING ROLE of WOMEN'S CONTRIBUTIONS to BREWING BEER

(Akshat Jain- Business Development)

Women and female brewers have a long history in the story of beer.

In the dawn of civilized brewing, making beer was a woman's job. It continues to be so in indigenous cultures around the world and is once again becoming an important workplace for women in the U.S., Canada and Europe.

Let's start at the very beginning ...

Early Evidence Found in China

Dr. Patrick McGovern, the scientific director of the Biomolecular Archaeology Laboratory for Cuisine, Fermented Beverages, and Health at the University of Pennsylvania Museum, notes that in mankind's earliest days, "While men were out hunting, women were out gathering the ingredients they needed to make other foods and drink to go with the woolly mammoth or mastodon."

He explains the female's role became even more critical once agriculture took hold because fermentation was often part of the food processing. Some of this fermentation was initiated by women chewing the grains to start the process.

The earliest documented beer evidence was found in Jiahu, China, dating 7000-5600 BCE. Rice beer, according to Chinese legend, was first brewed by Yi Di,

the wife of Yu the Great. McGovern writes that in areas of Japan and Taiwan, "You can still find women sitting around a large bowl, masticating and spitting rice juice into the vessel as they prepare the rice wine."

The oldest extant beer recipe, written in cuneiform, dates to ancient Mesopotamia, around 1800 BCE. The Hymn to Ninkasi, the Sumerian goddess of brewing is both a song of praise to Ninkasi and an ancient recipe for brewing.

While written down around 1800 BCE, the hymn is probably much older since archeological evidence for brewing the beer goes back to 3500-3100 BCE at the Sumerian settlement of Godin Tepe in modern-day Iran. In ancient Babylon women were bakers/brewers and also distributed the beers.

According to the preeminent beer historian Alan Eames, another Sumerian beer goddess was Siris, who watched over the daily ritual of brewing. Eames notes that only women were allowed to brew and their beers included all manner of strange ingredients such as spices, peppers, tree bark and powdered crab claws. Sounds much like modern craft brewers — except for the powdered crab claws part.

Perhaps the most interesting of these brewsters was Kubaba. While the circumstances of her elevation are unknown, Kubaba is the only female listed in the Sumerian King List, compiled around 2100 BCE, and probably the first recorded woman ruler. The Sumerian King List names her as the woman tavern-keeper. Legend says she reigned for 100 years (which may be a stretch).

Eames also notes that women ran the beer halls and taverns, with the price of beer being raw grain. The Babylonian Code of Hammurabi, from about 1500-2000 BCE, harshly states that if a tavern owner (a woman) does not accept barley as the price of beer, but if she receives money and the price of the drink is less than the that of the barley, she shall be convicted and the judges shall throw the brewster into the water. It also states that if conspirators meet at a tavern but are not captured then the tavern-keeper shall be put to death. Ouch.

Ninkasi and Siris were not the only ancient brewing goddesses. Nearby Egypt had Tenerit, the goddess of beer, and Hathor, the goddess of drunkenness. Egyptian hieroglyphics show women both brewing and drinking beer.

Early Brewing Tradition in Europe



EGYPTIAN HIEROGLYPHICS SHOW WOMEN BOTH BREWING AND DRINKING BEER. (PUBLIC DOMAIN)

From the Middle East beer brewing spread through Egypt to Greece, where beer was a distant second favorite to strong wine; to Rome where people also preferred strong wine; and throughout Europe.

The Romans reported that traditional German societies drank ale produced by women, mainly made from fermented honey. Women in the migrating Germanic tribes often brewed in forests to avoid pillaging raiders, some of whom were Vikings.

Based on archaeological finds in Northern Bavaria, Germans were brewing beer as early as 800 BCE. This continued for centuries after the Christian era, and once again brewing was the domain of the hausfrau.

From the 8th through the 10th century Vikings rampaged throughout North Africa and Europe. Viking beer was called Aul from which we obtain the name “ale.”

According to Eames, “Viking women were the exclusive brewers in Norse society and law dictated that all brewhouse equipment remained the property of women.”

A record in England shows that women probably were the vast majority of brewers until the 13th century. These women, known as alewives, brewed beer in their kitchens.

Eames writes that, “Beer remained an essential diet and selling surplus beer became important to the economy of most households. When a housewife had extra beer to sell, an ale-stake — a long handled pole or broom handle — would be placed over the front door or in the road.”

Often there was a garland of hops atop the broomstick. This marker continues to be seen throughout the world, especially in indigenous societies and probably is related to the brewer’s star which as hung outside pubs in Germany when fresh beer was available.

world, especially in indigenous societies and probably is related to the brewer's star which was hung outside pubs in Germany when fresh beer was available.



**PHOTO SHOWS WOMEN MAKING CHICHA BEER.
(PUBLIC DOMAIN)**

One of the regions where similar flags or notices are put out when beer is ready is Peru. The local corn-based Chicha beer is made in small homes and batches and a flag is displayed out front when Chicha is available.

A friend from our local homebrew club, who toured the Inca Trail, reports that she went off on her own for part of a day to find the local Chicha beer: "On that last day... I went for a long walk. I ended up in a village and knocked on a door that was flying the flag. When I walked back to the spa, I noticed another woman was actually making Chicha on the road and selling Chicha she made a few days earlier. This Chicha was very different because the natural microbial mixture was most likely different."

Later her tour guide took her to a Chicha brewing friend and she reports she was told that the women enjoy the whole interaction because, "The men drink and the women laugh at them when they act silly."

She also relates that virtually the same story exists in Nepal, according to a friend who taught her how to brew Chang, the beer of the Himalayas. Clearly, the brewing responsibility in indigenous societies comes with a bunch of societal fun for the brewing wives.

Female Brewers Begin Making Inroads

In Europe in more modern times there have been inroads for women in the brewing industry.

Perhaps the most notable person is Franciscan Sister Doris of the Mallersdorf Abbey in Bavaria. Mallersdorf is one of the few brewing monasteries in Europe and perhaps the only nunnery.

Sister Doris began her brewing apprenticeship in 1966. She became the brewmaster in 1975, taking over from another sister who had been brewing there since the 1930s. Like St. Brigid, the second most famous saint in Ireland, Sister Doris is renowned for converting water in beer.

More recently Anne-Françoise Pypaert became the first female Trappist brewmaster. Yes, that reads correctly. She is the brewmaster at the world famous Orval Trappist monastery.

While she was the only woman at Orval in 1992 when she was hired, the brewery now employs eight other women: two in the lab, one in Research and Development, four in the office, and one in the cheese factory.

Brewmaster Pypaert tells us, "The feminization of brewers helps to bring a certain nobility to the beer. Beer is no longer a product intended only for men, but also for women who enjoy it more and more."

Similar things are happening in England. Sara Barton opened her own brewery, aptly called Brewster's Brewery, in 1997. In 2013 she was named England's Brewer of the Year.

Another woman, Emma Gilleland, was the first female head brewer in England and now is the director of supply chain for Marston's Brewery, the leading independent brewery in England. Gilleland oversees the brewing and distribution of over 60 beers from five Marston breweries including the beers using the famous Burton Union system.

Marston's, the only brewery in England still using Burton Unions, was described to us years ago by a brewer at the time as "The cathedral of British brewing." The increased visibility of these women and others has played a big part in attracting other women, many in various aspects of the industry.

Women Brewing in Early America

In the New World, colonial and subsequent Americans followed their homeland traditions. Early colonial women continued to brew for family and friends in their kitchen brewery. While this changed in the cities with the growth of regional breweries, in rural areas it remained the same for a long time. These women brewed with what was available to them including corn, pumpkins, oats, wheat and honey.

America has a similar history to England. As brewing became a commercial enterprise, men dominated the trade. However, there were still some women involved in the industry. Mary Lisle was the first recorded but unofficial brewster in the colonies. She inherited her father's brewery, the Edinburgh Brewhouse, in 1734. Her sister, Elizabeth, inherited his malt house. Mary ran the brewery until 1751 when Robert Steel bought it.

As families moved to the cities and the local breweries grew, refrigeration and industrialization essentially ended women's involvement in the brewing system. Prohibition did not help and there were few small breweries for a long time after the passage of the Volstead Act and the 21st Amendment to the U.S. Constitution ended Prohibition.

American Women Among the Craft Brewing Pioneers

Women have been among the pioneers in the craft beer resurgence beginning in the 1980s and have attracted an increasing number of women to the craft brewing industry.

Women such as Mellie Pullman (Schirf), Carol Stoudt (Stoudts), and Teri Fahrendorf (Steelhead), three of the first women brewers, and Kim Jordan (New Belgium), Irene Firmat (Full Sail), Deb Carey (New Glarus), and Marcy Larson (Alaskan) who helped open some of the early breweries and served in numerous capacities other than brewer. The trailblazing continues with people like Andrea Stanley who opened one of the first craft malteries in 2010. She also serves as president of the craft maltsters guild.

Several of these women mention the difficulty of raising funds to open a brewery, but mostly because the idea of making craft beer in the 80s and 90s was still foreign to a lot of people.

"Everyone just thought we were crazy for wanting to build a brewery," Irene Firmat says. "It was not a woman's issue." And it was hard work. Kim Jordan talks about "serving beers on Thursday, Friday and Saturday, delivering a newborn son the following Wednesday, and opening a new brewery the subsequent Monday."



**CAROL STOUTD CO-FOUNDED STOUTD'S BREWING IN LANCASTER COUNTY, PENNSYLVANIA, IN 1986.
(CREDIT: STOUTDS BREWING)**

Deb Carey's page on the New Glarus website says, "she does everything except brew beer".

The trailblazing continues with people like Andrea Stanley who opened one of the first craft malteries in 2010. She also serves as president of the craft maltsters guild.

Several of these women mention the difficulty of raising funds to open a brewery, but mostly because the idea of making craft beer in the 80s and 90s was still foreign to a lot of people.

"Everyone just thought we were crazy for wanting to build a brewery," Irene Firmat says. "It was not a woman's issue."

And it was hard work. Kim Jordan talks about "serving beers on Thursday, Friday and Saturday, delivering a newborn son the following Wednesday, and opening a new brewery the subsequent Monday."

Mentoring a New Generation of Women in Beer



TERI FAHRENDORF FOUNDED THE PINK BOOTS SOCIETY TO EMPOWER WOMEN BEER PROFESSIONALS. (CREDIT: PINK BOOTS SOCIETY)

Most often their industry mentors were men since there were few women brewing at the time. Sometimes the mentors merely provided moral support and encouragement. Fahrendorf remembers when Paul Shipman, the founder of Redhook Ale, told her that he did not have any openings but, “One day you will be a brewery owner or brewmaster.”

Years later he does not remember the experience, but Fahrendorf certainly does.

Many of the women pioneers are now mentors themselves.

Stanley is working to get women on the board of the maltsters guild. She's also working with other women to do the same for the craft industry as a whole.

Among the more ambitious and largest such program is the Pink Boots Society (PBS). When Fahrendorf took time off in 2007 to drive across the country brewing at various places, she found at least 60 women brewers asking at different breweries, “Are there others like us?”

She realized they had no connections.

She eventually developed a list of the women brewers which became the start of the PBS. PBS works to, “Assist, inspire and encourage women beer professionals” through education.” From the original 60 members there now are over 30 chapters across the world with more than 2,000 members from all aspects of the industry.

Fahrendorf also helped organize Barley's Angels, a group for women who are interested in craft beer but not brewing. Barley's Angels works with breweries, brewpubs, restaurants, alehouses and other places “to advance the female consumer craft beer enthusiast, resulting in increased patronage and revenue from women, while encouraging education and interest in craft beer among this often under-recognized demographic group.”

While mostly in the U.S., there are now more than 100 chapters around the world.

KIM JORDAN ENDS A QUICK TRIP DOWN A SPIRAL SLIDE AT THE NEW BELGIUM FORT COLLINS FACILITY. THE SLIDE REMAINS IN PLACE TO THIS DAY. (CREDIT: NEW BELGIUM BREWING)

Advice to the Next Generation of Women in Beer

Jennifer Glanville, a brewer at Boston Beer/Sam Adams, thinks she has been called a pioneer “because I survived this long.” When she met Sister Doris at Maltersdorf she says: “We talked about beer and brewing, not about women in brewing.”

“We joke that brewers' events are the only place where there is not a line to the women's room,” Irene Firmat says.

Fahrendorf relates that when she started brewing she often did not go on trips because there was no one to share a room with.

That old norm clearly is changing, but there still is work to be done, and these pioneers have advice for women starting in brewing.

Firmat: “Feel strong and empowered. We have a better palate. Have a sense of confidence without expecting conflict.”

Stoudt: “Knowledge helps gain respect.”

Jordan: “Make sure you love it and work hard.”

Fahrendorf: “If you become discouraged, don't give up. Be stubborn. If you don't get a particular job then go elsewhere, be amazing, and make them jealous. When you get 5-10 years down the road stop thinking about yourself and become a mentor to others.”

At this point, Ninkasi probably is looking down from the pantheon of beer goddess and smiling.

<https://www.craftbeer.com/craft-beer-muses/evolving-womens-contributions-brewing>



One always has
ENOUGH TIME,
IF ONE WILL
APPLY IT WELL

Florencia Joseph, HR Dept.)

There was once a person who worked long and hard for making a great wealth & career. One day he decided to rest from the work and to live in luxury for his pleasure, which he could afford because of his wealth. Just when he made this decision, an angel of death came to take him.

Being a very wealthy person, he decided to buy some more time from the angel of death at any cost., He said “Give me just one hour of my life, so that I could admire the beauty of this earth for the last time and spend some time with my family and friends whom I haven't seen for a long time, and I will give you all of my wealth”. But the angel refused again.

Finally, the man asked if the angel could give him at least one minute so that he could write a goodbye note. His wish was granted, and he wrote a note: “Spend your time, which was given to you, in the right way. I couldn't buy even an hour of life with all of my wealth. Listen to your heart and check if the things surrounding you have a true value. Cherish every minute of your life.”

Time is a special resource that you cannot store or save for later use. Everyone has the same amount of time each day. Time not well used cannot be retrieved. **Managing time is the way, how we decide to utilize our time in order to maximize our productivity in achieving certain long-term goals.... But How....?**

TIME MANAGEMENT is the process of planning and exercising conscious control of time spent on specific activities, especially to increase effectiveness, efficiency, productivity. It is a juggling act of various demands of social life, employment, family, and personal interests and commitments with the finiteness of time. Using time effectively gives the person a choice on spending or managing activities in their own way and convenience. Most people feel like they have too much to do and not enough time. They blame lack of time for their poor finances, stress, bad relationships, and for not exercising their body or even completion of tasks.

Adopting **good time management techniques** in your life isn't about squeezing as many tasks as you can into your day. It's about simplifying how you work, getting things done faster, and doing things better. By doing so, you'll have more time to play, rest, and do things you love. *Don't try to work hard, invest in smart working.* There is one deed that is important and easily available technique of time management, and that is getting up early in the morning, give up

management, and that is getting up early in the morning, give up watching TV late at night and go to sleep a little earlier than usual. It will then be easier to wake up early. Even waking up 15 minutes early would be great. Always plan your time well and don't waste it on unproductive matters. Be careful not to procrastinate, and do everything in the best way you can, with focus and attention.

Below, you will find a list of time management techniques. They are a set of skills that allow you to put your focus on the things that matter, get more done and help you be more productive.

Skills for effective Time Management

Eliminate the Unnecessary – This becomes more & more true every day. Either professionally or personally, eliminating the “unnecessary” in life goes a long way in making you more productive. Put simply, you need to draw a firm, distinct line between the “necessary” and “unnecessary” in your life.

Plan Your Work – If you work every day having no idea what you want to accomplish, then guess what? You'll probably accomplish nothing. Set aside ten to fifteen minutes before any work and either write down or mentally plan what you want to accomplish at what particular time

Multitask and know when to – For multitaskers, one should just multitask their way through every single minute of every day, constantly having four or five things going at once? Absolutely not. You also have to know when & what not to multitask

Eliminate distractions – Direct all of your attention and energy to the task at hand, soak yourself in it. It's just you and your work. Nothing else should matter, and nothing else outside of that should exist at that particular moment in time

Remember to enjoy every day with an appropriate work life balance. Finishing an oversized workload today isn't worth an unproductive, burnt-out day tomorrow. Work steadily and stay at your best pace. Moving fast through tasks reduces work quality and creates stress, but keep in mind: *The road is always more important than the destination.* An alert mind is a high-functioning mind and one that's less tolerant of time-wasting activities. *Time – as he grows old teaches many lessons... The key is not spending time but investing it... If you want to make good use of your time, you've got to know what's most important and then give it all you've got*

***“Life and Time are the world's best teachers
Life teaches us to make good use of
Time & Time teaches us the value of Life”***

Dr. APJ Abdul Kalam (Former Indian President)

**All the best
&
be the best**

Diwali Celebration





Name : Ashish Saini
Department : BD & CS
Date of Joining : 29th, Nov, 2018



Name : MD Khaleel
Department : Customer Solutions
Date of Joining : 1st, Oct, 2018



Name : Mr. Manish Kumar
Department : Accounts
Date of Joining : 22th, Oct, 2018



Name : Ms. Neha Kumari
Department : R&D
Date of Joining : 12th, Nov, 2018

WHO WE ARE

Catalysts was established in 2003. Having its corporate office in Delhi, R&D center in the largest state of Uttar Pradesh in India and Manufacturing units in the Hill state of Uttarakhand. It is a leading research and quality certified Biotech company. We are engaged in delivering enzyme based eco-friendly solutions to many industry verticals. We are a multilevel quality certified company having certification of ISO 9001:2015, FSSC 22000, HALAL, KOSHER, NABL & DSIR.

Our Process expertise based enzyme formulation are a key competitive advantage for Catalysts and thus for our customers. We have a modern fully-equipped technology centre, where application research is done extensively using substrates received from client side.

Our technical team provides real time process and troubleshooting support to various industries like Molasses Ethanol, Grain Ethanol, Carbohydrates processing, Malt extraction, Brewing process and sugarcane juice processing.

OUR OFFICES

HEAD OFFICE

- 240, Functional Industrial Estate, Patparganj, Delhi - 110092, India.
Phone: + 91 11 49867313 / 49867314

R&D CENTRE

- 3/1/4, Site IV, Industrial Area, Sahibabad, District Ghaziabad, UP 201010, India
Phone No: +91 120 4104681 / 4370799

REGIONAL OFFICES

- Plot No. 847, Ground Floor, Survey No. 113/12, Taluka Haveli, Baner, Pune - 411045, Maharashtra
Phone No: +91 20 48600505
- Ground Floor, Plot No 4, Block No 35, Autonagar, Vanasthalipuram, Hyderabad 500070, Telangana, India
Phone No: + 91 40 24025560

UNITS

- Khasra No 1100, Salempur Rajputan Industrial Area, Roorkee 247667, Distt Haridwar, India
Phone No: + 91 1332 267722/267733

LIKE US, FOLLOW US AND CONNECT WITH US ON





Catalysts

making things happen...

ISO 9001:2015 certified | FSSC 22000 certified

CORPORATE OFFICE:

240, Functional Industrial Estate, Patparganj, Delhi 110092, India.

Phone: +91 11 49867313 / 49867314

Email: info@thecatalystsgroup.com | Web: www.thecatalystsgroup.com

Catalysts Connect is a Catalysts Group Publication. The views/pictures/articles used or expressed in this magazine are not necessarily those of the Catalysts Group. Design & Editing: Kavita Rastogi, Corporate Communications
Oct - Nov - Dec - Jan 2019 Volume 31 © Catalysts Group

