

ਹਾਥੀ



# Catalysts Connect



## INDIA'S LEADING ENZYME MANUFACTURERS



**CATALYSTS GROUP** is an integrated biotechnology company with leadership position in enzyme application in Industries like Fermentation, Alcohol, Sugar, fruit juices & Wines, Brewing & Malt & other speciality areas.

**CATALYSTS** flexible blending & production infrastructure including cold rooms etc. along with experienced technical, sales & laboratory support ensures we are leader in customer service.

We offer knowledge based technical support in many areas of enzyme use along with state-of-art laboratory support. Our in-house quality testing can perform most enzyme assays.

### CATALYSTS products are as follows:

**MALT EXTRACT** - Malt Extract is a sweet, treacly substance given to children and adults as a dietary supplement. It is more and more often used in candies, bakery products, sauces and the brewing industry. Our products maximizes the extract yield with improved wort quality even in case of use of unmalted grains as an adjuncts due to efficient break down starch, protein, glucans.



- Natuglucanase M
- Enzyliq STX
- Natupap Super
- Natunase BG Plus
- Natuprotease N
- Natunase BG Power
- Natumalt
- Enzyliq Super AX

**STARCH** - The starch sugars are by far the most common starch based food ingredient and are used as sweetener in many drinks and foods. It is used in Glucose syrups, corn syrups, fructose syrup & Sugar alcohols, such as maltitol, erythritol, sorbitol, mannitol and hydrogenated starch hydrolysate, are sweeteners made by reducing sugars.

- Enzyliq Super AX
- Enzyliq STX
- Enzyliq FAA
- Natunase BA



**BREWERY** -The purpose of brewing is to convert the starch source into a sugary liquid called wort and to convert the wort into the alcoholic beverage known as beer in a fermentation process effected by yeast. our product reduces Boiling time, cost & filtration rate. Enhances the yield & achieves brilliant clarity of the Cold Wort.

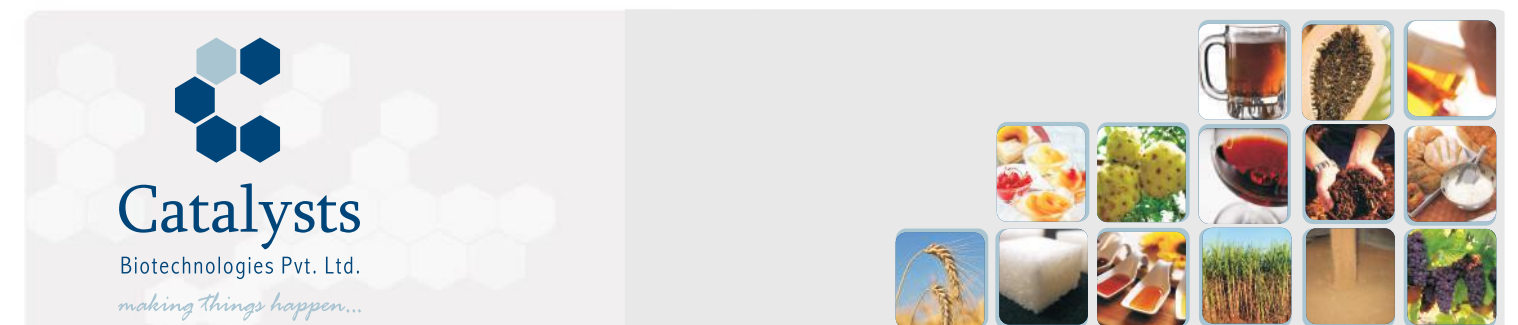


- Natunase TAA
- Natuferm
- Natunutr
- Natupap
- Natumalt
- Natunase FAA
- Natunase ALDC
- Natufine
- Natunase BG
- Natufloc
- Natufoam
- Natunox

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### CATALYSTS products are as follows:

**SUGAR** - Sugar industry is a highly controlled industry starting from sugarcane prices, cane area to sugar prices resulting very thin margins. our enzymatic solutions are really a boon to the industry to marginally improve the profitability.



- Enzylase
- Sweetase AFTS\*
- Enzydex
- Enzytreat

These products improves the process efficiency in terms of viscosity reduction at various stages of sugar manufacturing process.

**MOLASSES** - The key raw material for IMFL players is molasses, which is a by-product of sugar, Indian liquors are predominantly molasses based only. Our products enhances the quality & quantity of alcohol by hydrolysing unfermentable sugars & converts the same to reducing sugars. It improves alcohol yield & fermentation cycle & efficiency.

- Enzymol Plus
- Fermezyme Plus

- Enzypro M
- Alcozyme M Plus



**GRAIN** -Grain Alcohol is produced by fermenting and distilling grain. It is also known as ethyl alcohol or ethanol. There are a number of industrial uses for grain alcohol - antiseptic, fuel , solvent etc.



- Alcozyme G
- Alcozyme G Pro

It is a unique researched enzyme based innovation which overall improves the sugar profile that in turn bring better alcohol yield, It improves conversion of starch to dextrin, consequently dextrans to glucose. Improved alcohol yield.

**Yeast** - Yeast is is a member of the fungi family which converts the Glucose (sugar) into Alcohol. This fermentation process is carried out by yeast cells using a range of enzymes.

- Safdistill C 70\*

- Ethhanol RED\*



\* Novozyme product, \*Fermentis product

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*Laughter Therapy*

Smartest Kid !!!

Q1. In which battle did Napoleon die?  
Answer: his last battle.

Q2. Where was the Declaration of Independence signed?  
Answer: at the bottom of the page.

Q3. River Ravi flows in which state?  
Answer: Liquid

Q4. What is the main reason for divorce?  
Answer: Marriage

Q5. What is the main reason for failure?  
Answer: Exams

Q6. What can you never eat for breakfast?  
Answer: Lunch & dinner.

Q7. What looks like half an apple?  
Answer: The other half.

Q8. If you throw a red stone into the blue sea what it will become?  
Answer: It will simply become wet.

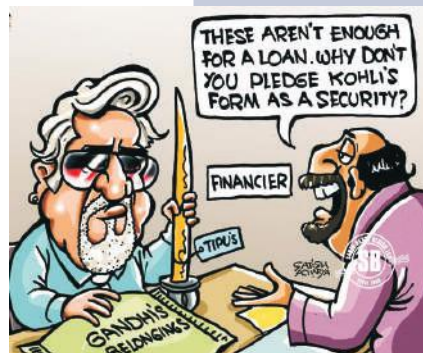
Q9. How can a man go eight days without sleeping ?  
Answer: No problem, he sleeps at night.

Q10. How can you lift an elephant with one hand?  
Answer: You will never find an elephant that has only one hand...

Q11. If you had three apples and four oranges in one hand and four apples and three oranges in other hand, what would you have ?  
Answer: Very large hands.

Q12. If it took eight men ten hours to build a wall, how long would it take four men to build it?  
Answer: No time at all, the wall is already built.

Q13. How can u drop a raw egg onto a concrete floor without cracking it?  
Answer: Any way you want, concrete floors are very hard to crack.



Virat Kohli's brilliant batting form floors Pakistan at Asia Cup. Virat seems to be the only silver lining in RCB owner Vijay Mallya's empire!

**Guess the Picture ?????**

**"Famous Actress turned politician"**

Start guessing..... to win surprise goody bag. Email your entries at [magazine@thecatalystsgroup.com](mailto:magazine@thecatalystsgroup.com)

**Find the Fault, DRESS-UP**

Can you find the fault in the picture ?

send your views/entries at [magazine@thecatalystsgroup.com](mailto:magazine@thecatalystsgroup.com) to win a surprise gift.

So hurry up !!

**Believe**

*Believe in Love, Believe in Faith, Believe in Truth  
Believe that no matter what happens, you have the power to prevail*

*Believe in Strength, Believe in Courage, Believe in Honor, Believe that everyone has the power to be good at heart*

*Believe in Song, Believe in Dance, Believe in Culture,  
Believe that no matter who you are or where you're from- everyone is unique*

*Believe in things you never would , Believe in doing things you never could, Believe in achievement  
Believe that if you think you can, you can- but if you think you can't, you won't.*

*Believe in the damned, Believe in the degenerate, Believe in the corrupted, Believe that evil does exist in many forms, but all can be overcome*

*Believe in spiritual, Believe in holy, Believe in sacred, Believe that your personal values can never be taken from you*

*Believe in mad, Believe in depressed, Believe in suicidal, Believe that one smile can save a life*

*Believe in magick, Believe in hope, Believe in dreams, Believe that the unbelievable happens everyday*

*Believe in time, Believe in forever , Believe in YOU  
Believe that as long as you believe in yourself - anything is possible*

by Chelsea Varvaro

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**MESSAGE FROM EDITOR****Welcome to our inaugural issue of Magazine - CATALYSTS CONNECT**

We are very excited to be moving along with our progress in the company, and looking forward to keeping you connected, informed & enriched with the company information which is one of the goals of Catalysts Connect.

By this magazine, it is a great way for all staff /workforce/ Clients at all locations of Catalysts Group, to stay informed on what is going on in the company, with staff, keeping readers updated on events etc ..... All articles will cultivate and strengthen personal development and relationships bonding between the management & employees.

It is often said, "that a tortoise on the move can overtake even the fastest horse if that horse stands still". The essence of any change process can be captured in this saying above which is the need to "move forward".

Having a Magazine in Catalysts Group is indeed a way forward to better things. I bet you are braced up to move to the next level. Coming up with an Magazine wasn't the easiest of things, especially coming up with a name.....the thoughts kept flowing ....is it hype, is it too stiff, will it catch staff attention .....on and on the thoughts came , and finally the name above. This magazine will cover write -ups that will improve our personal development and our attitude(s) to work, it will be knowledge intensive, exciting and fun filled.

We hope to come up with an issue every quarter & make it an information source you look forward to receiving.

Hoping to hear from you!

**Chanchal Nim**

**FRONT COVER**

Catalysts Group logo

**BACK COVER**

Holi celebrations at Catalysts

**CATALYSTS CONNECT**

An integrated in-house Magazine, which connects the company with its employees & clients.

"Eventually everything connects - people, ideas, objects. The quality of the connections is the key to quality"

- Charles Eames

"Cherish your human connections: your relationships with friends and family."

- Joseph Brodsky

**MESSAGE TO ALL**

**VOL 1; Inaugural Issue;  
Jan-Feb-Mar 2012**

We welcome your suggestions & valuable comments.

Please e-mail us your views on the magazine CATALYSTS CONNECT at [magazine@thecatalystsgroup.com](mailto:magazine@thecatalystsgroup.com)

For participating in quizzes/ activity, do email your answers along with the Quiz Name & Magazine Volume at [magazine@thecatalystsgroup.com](mailto:magazine@thecatalystsgroup.com)

**The views/ Pictures/ Articles used or expressed in this magazine are not necessarily those of the Catalysts Group. It is not a priced publication.**

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## MESSAGE FROM THE MD

### Message to all members of Catalysts team on completing 9 successful years of Catalysts Group.

Dear All,

With humble beginnings, almost a decade back, we started an effort which today is one of the largest industrial enzyme companies in India.

Reaching amongst top 5 has been possible due to our consistent hard work, harnessing market opportunities working as a team and continuous support from our customers.

I am proud to note that in this short period of time we have achieved benchmarking status and have done pioneering work to introduce biotechnology in industries like Sugar and Molasses in India in which we have been able to consistently maintain leadership status both in terms of business and innovation.

We were 2 people when we started, today we are a strong 64 and rising. An organization which started as a trading entity is today a trusted and well known solution provider to all our customers.

Our constantly growing infrastructure like well equipped application R&D centre, ISO certified production facility and huge ware-housing facilities backed by well qualified, trained and dedicated manpower has enabled us to provide unmatched service and top quality products to our clients.

Our sales revenues have reached to INR 350 million and we still remain as hungry for more business as we were on the day we started, 9 years back. This journey has been very exciting, challenging and testing for all of us.

What pleases me is the fact that this thought of becoming the largest in our business is there as the primary motivator in all of us even today. I sometimes wonder the levels of achievement which we will be at in another 9 or so years.

There have been many who along the way joined our team, contributed and even though are no longer with us, I am sure, wish us all the very best as we do to them.

I am happy to note that all of them are doing well in their chosen careers and companies and implementing with gusto what they learnt during their time with us.

I want to take this opportunity to also recognise our various Principal Companies like Biocon, Genencor, Novozymes etc., who have taken this journey with us from time to time.

I am sure we are well placed to achieve our vision for 2015 and would like this platform to urge one and all to not only work towards that but also start thinking of our vision 2020.

I look forward to creating with you all a work place which we all look forward to going to everyday of our working lives.

Regards,

Munish.

*making things happen...*

Dear Friends,

I welcome you all to the first edition of our '**Catalysts Connect**'.

This gives me a platform to thank each one of you for all the support, encouragement & guidance to us for all these years.

Since our inception on January 6th, 2003 we have not only grown in turnovers, but grew as a team, as professionals, as intellectuals & as enzymatians.

Molasses our strong spine, today holds 70% Indian market share with initial breakthroughs in International markets recently.

Our huge basket for molasses application addresses all types of molasses quality which varies from region to region. With the technical team spread all over the country to support our distillery partners today Catalysts has become a brand to reckon.

We thank our Principals for posing the trust & confidence on our abilities & team. Today, we offer a package of products right from enzymes to yeast to contamination controllers and fermentation boosters.

Brewery, which had been taking baby steps is now all set for a long leap. With entire basket of enzymes & additives today we proudly service to almost 40% breweries in Indian subcontinent.

Starch, the new kid on the block. Although present since 2005 but we directly came with 'Catalysts' brand in the mid of last financial year, with all the confidence & trust from the market within 6 months we gained a share of more than 20%.

Malt Extract, the underdog in our companies portfolio has multifold it's business in last 3 years. Today, the product basket has increased to cover almost all applications in the said segment. We thank all the market opinion leaders for the kind acceptance.

The sweet pill division 'Sugar' is the new entrant to the family in last financial year. Lead by experienced team & has already started setting benchmarks in Indian sugarcane fields.

In the year 2012-13 Catalysts is ready to take on the market with high gravity yeast from worlds largest yeast company both in grain & molasses segment. This year we plan to focus strongly in international markets.

I again express my warm gratitude to each one of you for believing in us & making us run on the success track. From this desk I also convey thanks to our team & associates for being with us strong & committed.

Regards,

Aditya.

## EMPLOYEE'S DESK



Catalysts Group wishing you *All the Best* today & throughout the coming Year !

Name	Designation	Date of Birth
Push Kumar Singh	Sr. Executive - Logistics	01 January
Pradeep Kr. Saini	Executive - Accounts	04 January
Rajinder Kr. Saini	Jr. Manager - Accounts	12 January
Jasvinder Singh	Dy. Manager - BD	15 January
Bharat Chaudhry	Dy. General Manager - BD	29 January
Ashish Shahal	Executive - Purchase	31 January
Dharmendra Pathak	Jr. Manager - R&D	06 February
O.P. Shukla	Manager - Production	20 February



Catalysts Group is delighted to Congratulate & wishes you all a happy Anniversary & a perfect day.

Name	Designation	Date of Marriage
Gaurav Verma	Jr. Manger-logistics	15 January
Pradeep Kr. Saini	Executive - Accounts	04 January
Pawan Madaan	Jr. Manger-Administration	20 January
Hema Singh	HR/Admin - Executive	06 February
Bharat Chaudhry	Dy. General Manager - BD	18 February
Dinesh Sharma	Manger - BD	28 February
Ranapratap	Executive - BD	04 March
Sanjay Kr. Poddar	Dy. Manger - Accounts & Finance	05 March

### WELCOME TO THE CATALYSTS GROUP

Name	Designation	Date of Joining
Rishabh Khanna	Jr. Manger - BD	06 February



**WE ARE THRILLED TO ANNOUNCE**

Mr. Kapil Khandelwal (Manager - Business Development, Pune) is blessed with a **BABY GIRL** on March 24, 2012.



Catalysts Family wishes Heartiest Congratulations to the new parents!!!



### Congratulations

To Mr. Umesh Kr. Purbey (Groom)  
& Ms. Priyanka (Bride)  
for tying knot on 19<sup>th</sup> February 2012.

*May the two of you find everlasting love between you that will strengthen with each passing year.*

*Have a happy married life.*

### SATURDAY DEBATE DAY

**Topic:** What will be the effects of fuel price hike to Different sectors, Common man and Indian economy??

**Views:**

Fuel price increase is a chain reaction. First the transportation cost will go up, this will have its effect on essential commodities which are transported on daily basis. Thus adding to inflation. Fuel price increase has its direct effect on moment of goods and services which is the back born of the economy. Hence effecting pricing of all products. Which in turn will effect the economy and increase inflation.

*by Jasvinder Singh*

Fuel price hike is going to affect the common man adversely as it will finally lead to inflation. The transportation cost of all basic amenities will go up due to which the common man will face a lot of problems in their daily life. Whereas on contrast to this the Indian economy, our rupee value is going down as prices hikes due to maximum import of the fuel for our consumption. Indian government is also not having any alternative solution against hike in prices of fuel.

If government will provide subsidies on fuel then government will mobilize funds to compensate the difference by increasing the taxes in other sectors and finally different sectors may also feel the burden of inflation. Altogether the moral of this is that everybody should understand that these resources are judicious and should not be wasted. Wherever possible we should save the fuel or discover other alternatives of fuels, otherwise in future we will be facing the greater impact of it.

*by Dharmender Pathak*

Hiking the crude oil price in international market will force the Indian government to increase the percentage of ethanol blending in fuel, that will Increase alcohol production in India. Currently government is blending only 2 to 3% ethanol in fuel & targeted to increase it 10 % up to 2017. Hiking the alcohol production will affect our Enzyme business .

*by Mithlesh Choubey*

The price hike in Fuel prices is not good for the common people and nor for the economy of the country also.

*by Ashwini Agarwal*

As the prices are frequently hiking for the traditional fuels we have to look out for the alternative fuels & Ethanol is one of the best renewal source. Ethanol produces less pollution, environment friendly, agriculture booster & non expensive fuel.

*by Isha Gool*



## AWESOME OBSERVATION ABOUT DRIVING IN INDIA..!! - BY SUGANDHA



For the benefit of every Tom, Dick and Harry visiting India and daring to drive on Indian roads, I am offering a few hints for survival. They are applicable to every place in India except Bihar, where life outside a vehicle is only marginally safer.

Indian road rules broadly operate within the domain of karma where you do your best, and leave the results to your insurance company. The hints are as follows: Do we drive on the left or right of the road?

The answer is "both". Basically you start on the left of the road, unless it is occupied. In that case, go to the right, unless that is also occupied. Then proceed by occupying the next available gap, as in chess. Just trust your instincts, ascertain the direction, and proceed. Adherence to road rules leads to much misery and occasional fatality. Most drivers don't drive, but just aim their vehicles in the generally intended direction.

Don't you get discouraged or underestimate yourself except for a belief in reincarnation; the other drivers are not in any better position. Don't stop at pedestrian crossings just because some fool wants to cross the road. You may do so only if you enjoy being bumped in the back.

Pedestrians have been strictly instructed to cross only when traffic is moving slowly or has come to a dead stop because some minister is in town. Still some idiot may try to wade across, but then, let us not talk ill of the dead.

Blowing your horn is not a sign of protest as in some countries. We horn to express joy, resentment, frustration, or just mobilize a dozing cow in the middle of the bazaar. Keep informative books in the glove compartment.

You may read them during traffic jams,

while awaiting the chief minister's motorcade, or waiting for the rainwater to recede when over ground traffic meets underground drainage.

Occasionally you might see what looks like a UFO with blinking colored lights and weird sounds emanating from within. This is an illuminated bus, full of happy pilgrims singing bhajans. These pilgrims go at breakneck speed, seeking contact with the Almighty, often meeting with success.

**Auto Rickshaw (Baby Taxi):** The result of a collision between a rickshaw and an automobile, this three-wheeled vehicle works on an external combustion engine that runs on a mixture of kerosene oil and creosote. This triangular vehicle carries iron rods, gas cylinders or passengers three times its weight and dimension, at an unspecified fare. After careful geometric calculations, children are folded and packed into these auto rickshaws until some children in the are not in contact with the vehicle at all. Then their school bags are pushed into the microscopic gaps all round so those minor collisions with other vehicles on the road cause no permanent damage. Of course, these children are charged half the fare and also learn Newton's laws of motion en route to school. Auto-rickshaw drivers follow the road rules depicted in the film Ben Hur, and are licensed to irritate.

**Mopeds:** The moped looks like an oil tin on wheels and makes noise like an electric shaver. It runs 30 miles on a teaspoon of petrol and travels at break-bottom speed. As the sides of the road are too rough for a ride, the moped drivers tend to drive in the middle of the road; they would rather drive under heavier vehicles instead of around them and are often "mopped" off the tarmac.

**Leaning Tower of Passes:** Most bus passengers are given free passes and during rush hours, there is absolute chaos. There are passengers hanging off other passengers, who in turn hang off the railings and the overloaded bus leans

dangerously, defying laws of gravity but obeying laws of surface tension. As drivers get paid for overload (so many Rupees per kg of passenger), no questions are ever asked. Steer clear of these buses by a width of three passengers.

**One-way Street:** These boards are put up by traffic people to add jest in their otherwise drab lives. Don't stick to the literal meaning and proceed in one direction. In metaphysical terms, it means that you cannot proceed in two directions at once. So drive as you like, in reverse throughout, if you are the fussy type. Least I sound hypercritical, I must add a positive point also. Rash and fast driving in residential areas has been prevented by providing a "speed breaker"; two for each house. This mound, incidentally, covers the water and drainage pipes for that residence and is left untarred for easy identification by the corporation authorities, should they want to recover the pipe for year-end accounting.



Night driving on Indian roads can be an exhilarating experience for those with the mental make up of Genghis

Khan. In a way, it is like playing Russian roulette (a casino game), because you do not know who amongst the drivers is loaded. What looks like premature dawn on the horizon turns out to be a truck attempting a speed record. On encountering it, just pull partly into the field adjoining the road until the phenomenon passes.

Our roads do not have shoulders, but occasional boulders. Do not blink your lights expecting reciprocation. The only dim thing in the truck is the driver, and with the peg of illicit arrack (alcohol) he has had at the last stop, his total brainy functions add up to little more than a naught. Truck drivers are the James Bonds of India, and are licensed to kill.

Often you may encounter a single powerful beam of light about six feet above the ground. This is not a super motorbike, but a truck approaching you with a single light on, usually the left one. It could be the right one, but never get too close to investigate. You may prove your point posthumously.

## INDIAN LIQUOR MARKET SOBERS UP IN FY12

Steep taxation, policy changes, elections & short summer pull down beer sales growth to 4%; liquor market growth also dips to 8%

High prices took the froth out of the Indian spirits industry last fiscal. The beer market, which was guzzling growth of 13% in recent years, inched up just 3-4% in the year ended March, its slowest growth in eight years. Liquor marketers too were sobered by steep taxation in several key markets that tempered growth to 8% in 2011-12, the first time it slipped into single-digit growth in decades.

"Growth has been stunted. The industry has never gone below growth rates of 10%," Deepak Roy, vice chairman and CEO of Allied Blenders and Distillers, which markets Officer's Choice whisky, says. Industry estimates total liquor sales of 250-255 million cases for last fiscal, up from 234 million cases in 2010-11.

Brewers in India added just 7-9 million cases last fiscal to close at 240 million cases. "Last fiscal was exceptionally tough because of multiple disruptions in major markets ranging from excise duty increases and elections to beer policy changes," a senior executive of a leading brewer says. Although brands such as Heineken, Miller High Life and Carlsberg Elephant were launched last year, industry players said these brands were unable to significantly boost growth.

Companies blame steep increase in tax rates and regulatory changes in key states such as Maharashtra, Tamil Nadu and West Bengal, more than high inflation and a slowing economy.

Unlike other consumer products, liquor is a state subject. State governments earn revenue by taxing spirits and beer separately. Perhaps the heaviest blow for the spirits industry, overall, came from an excise duty increase in Maharashtra that forced companies to raise consumer prices of liquor and beer by 30-40% in last April.

The price of 650 ml bottle of Kingfisher beer in the state rose to . 95 from . 75 after the tax hike while that of Carlsberg beer increased to . 135 from . 100, and a 180-ml nip of Officer's Choice whisky to . 99 from . 64 earlier. As a result, sales volumes of spirits in Maharashtra dropped 7-10% up to February, while that of beer fell at least 5%, industry players say.

A short summer and early rains last year too added to the

brewer's woes. Nearly 40% of beer consumed annually within North India is in the first quarter of a financial year while peak summer months account for 35% of sales in South India too. "When the first quarter is sluggish, even if sales pick up in subsequent quarters it is hard to make up," Shekhar Ramamurthy, deputy president of United Breweries, says.

The largest beer market, Andhra Pradesh, was meanwhile impacted by changed beer procurement policy, Telangana agitations and a crackdown on liquor syndicates. Soren Lauridsen, MD of Carlsberg India, says continued increase in excise duty rates will impact demand as well as the profitability of brewers. Companies are unable to pass on increase in raw materials as consumers are already paying more, he says. In

fact, besides excise increases in Punjab, states such as West Bengal, Tamil Nadu and Kerala had several "dry days"—that is, days when liquor retailing is not allowed due to special occasions or festivals—because of elections. Companies also took time to find

their feet over requirements of the new government in Tamil Nadu, a market where wholesale and retail of liquor is controlled by a state corporation.

The spirits market—consisting of whisky, rum, vodka and brandy—was also struck by a triple-duty increase in 17 months in West Bengal. It led to 48% drop in liquor volumes in the state in the third quarter. For the whole year, growth was flat in the state.

But marketers say one exceptional year would not derail long-term strategies. "Every market has its own dynamics and in the portfolio of SABMiller's global businesses, India remains one of the largest growth opportunities given its size and changing demographics," SABMiller India MD Paolo Lanzarotti says. Companies are still betting on the growing base of legally drinking consumers in India who are spending higher.

Ashok Kapoor, MD of United Spirits, says excise shocks are aberrations. "Unlike beer, brands are price laddered in the liquor segment which cushions such price increases to some extent," he says.

Source: The Economic Times

## In Low Spirits

Growth rate of beer and liquor Industries  
BEER



## Reasons for slower growth

EXCISE DUTY increase in Maharashtra, Bengal raised prices by 30-40%  
SHORT SUMMER and early rains hurt beer consumption

ANDHRA PRADESH was impacted by changed beer procurement policy, Telangana agitations and crackdown on liquor syndicates.

ELECTION-RELATED dry days in West Bengal, Tamil Nadu & Kerala  
GOVT CHANGE in Tamil Nadu, where a state firm controls market, hit sales

SOURCE: Industry

JAYEETA



## RECENT DEVELOPMENTS IN ENZYME MANUFACTURING - BY DR. LAMBIT

Enzymes are proteins which catalyses a reaction with a suitable substrate. It can at times overcome the use of high temperature, extreme pH and organic solvents in accelerating a reaction. Enzymes in these reaction process can offer increase reaction specificity, product purity and lessen environmental impact.

For these properties of enzyme the use has increased several fold for last 3 decades and is on the rise and also new applications are explored and applied continuously. The enzyme market and number of competitive enzyme based processes is growing rapidly, because of cheaper production methods, new application fields, and new enzymes.

This growing use of industrial enzymes is dependent on constant innovation to improve performance and reduce cost. This innovation is driven by a rapidly increasing database of natural enzyme diversity, recombinant DNA and fermentation technologies that allow this diversity to be produced at low cost, and protein modification tools that enable enzymes to be tuned to fit into the industrial marketplace. The application of genetic engineering techniques in enzyme manufacturing is dramatically sparking the exploitation of new enzymes and the development of new enzyme properties.

Due to new technologies, new enzymes not accessible before can be cloned into and produced from a well-known host organism. Thereby, enzymes from almost any source in nature become accessible, including enzymes exhibiting unusual properties, such as extreme thermostability. Applying new technologies, the enzyme properties may be efficiently altered which will lead to an increase in the variability of enzymes available and might lead to enzymes not present in nature so far. This mainly concerns enzyme stability, catalytic mechanism, substrate specificity and range, surface activity, folding mechanisms, cofactor dependency, pH- and temperature optima, kinetic parameters. Furthermore, enzymes could be chemically modified. With applying new technologies, the variability in enzyme structure is dramatically increased and enzyme properties are significantly enhanced. Some the methods for obtaining novel enzyme and enhancing its production are as follows.

**Natural enzyme diversity:** Direct microbial screening is the classical method of screening enzymes, soil sample from various habitat are collected and screened for enzyme by growing in laboratory conditions through mimicking the natural habitat and providing nutrient to the microbes and inducing particular enzyme by substrate or specific conditions. This method though vital, has lot of limitation as many novel enzymatic function are not accessible by this method. In fact, less than one percent of microbes are cultivable in laboratory condition. This is especially true for microorganisms from "extreme" habitats, endosymbionts and other niche-specialised communities from

which interesting novel enzymes can be expected. Due to recent technological breakthroughs in DNA and RNA sequencing metagenomics has become a major method for enzyme discovery. Metagenomics (also referred to as environmental and community genomics) is the genomic analysis of microorganisms by direct extraction and cloning of DNA from an assemblage of microorganisms. Applying this method potential gene with specific properties may be directly explored for expression in a host organism.

**Molecular cloning :** Almost all molecular biology technologies is related to the gene. To facilitate the study of genes, they are isolated and amplified. One method of isolation and amplification of a gene of interest is to clone the gene by inserting it into another DNA molecule that serves as a vehicle or vector and is replicated in living cells. Since two DNAs of different origin are combined, this is called a recombinant DNA molecule. Following transplantation into the host organism, the foreign DNA contained within the recombinant DNA construct may or may not be expressed i.e., the DNA may simply be replicated without expression or produce desire protein or product.

This expression of a foreign gene requires restructuring the gene to include sequences that are required for producing a mRNA molecule that can be used by the host's translational apparatus e.g. promoter, translational initiation signal and transcriptional terminator. Specific changes to the host organism may be made to improve expression of the ectopic gene. In addition, changes may be needed to the coding sequences as well, to optimize translation, make the protein soluble, direct the recombinant protein to the proper cellular or extracellular location, and stabilize the protein from degradation.

**Fermentation Technology :** Fermentation technology is the oldest of all technologies, and is a process of chemical change caused by organism or their product producing effervescence & heat. This process leads to production of a product by means of enhancing the mass culture of microorganism. Different systems like batch processing (runs in batches) continuous processing (constituent are added and discharged continuously) and fed batch system (aliquot continuously or periodically added without removal of culture fluid). In fed batch type, the fermentor is designed to accommodate the increasing volume. Tremendous



What can you expect from the present day work life? High salary packages? recognition? Honors? Challenging assignments? Monetary as well as non-monetary incentives?

These are not all that you can expect from the modern day work life! You can expect several health issues as well! Acidity, indigestion, stress and weight gain are the other additional perks offered by today's work life. But you need to take a deeper look! Have you taken any initiative to solve office related food issues? Or you just skip lunches and utilize the lunch breaks in doing the tasks assigned to you? Here are some mini meal ideas for you:

**Low-Calorie, Cooked Snacks:** When it comes to carrying a separate snack for the evening, it sounds like a chore! So the best option is to see what is being served in your office canteen. Instead of opting for some snacks like vada pav, choose healthier snacks, like dhokla, idli, egg white omelette, brown bread vegetable sandwich, uttapam, soups, cutlet, bhel puri and popcorn. These are low-calorie, healthier items. But always remember to check the quantity. Too much consumption of these snacks can prove to be bad.

**Raw, Uncooked Items:** Fruits and salads without dressings or with low calorie dressings like curd or lemon are healthy snack ideas! But it is always better to carry a whole fruit with you as cut fruits are subject to oxidation and might lose some vital vitamins as well. You can carry fruits very easily - just put an apple or an orange in your bag! Else, you can have it in the mid morning meal! Often, canteens serve fruit chaats and green salad.

**Nuts:** Raw or roasted almonds, peanuts, raisin and soybean act as good stress relievers and can be included to prepare a healthy mini meal. Apart from being good sources of protein, they are rich in certain essential fatty acids and amino acids, which can boost your metabolism as well as your immunity. The best part is that you can store some nuts easily in an airtight container, which you can keep in your office drawer or in your locker.

**Beverages:** Drinks like coconut water, buttermilk, fruit juice, milk, light coffee and green tea are ideal if you need instant refreshment. These beverages are healthy, low-calorie options and thus, these are helpful in weight management.

you can also keep a pack of oat cookies, whole wheat biscuits or even multigrain biscuits in your bag. These biscuits and cookies are easy to store and can make a very healthy mini meal.

You cannot escape or change the sedentary nature of the modern-day jobs, but making some changes in your meal patterns would allow you to combat the effects of the stressful work life.



## THE HAPPINESS HANDBOOK - BY MAHENDRA

Some of the good things that changes your lifestyle and make u happy always...!! 😊

**Try to Do these small things and stay happy..**

**Health:**

- Drink plenty of water.
- Eat breakfast like a king, lunch like a prince and dinner like a beggar.
- Eat more foods that grow on trees and plants and eat less food that is manufactured in plants. 🥗
- Live with the 3 E's -- Energy, Enthusiasm, and Empathy. 😊
- Make time to practice meditation, yoga, and prayer. 🧘
- Play more games. 🎮
- Sit in silence for at least 10 minutes each day. 🤫
- Sleep for 7 hours. 😴
- Take a 10-30 minutes' walk every day. And while you walk, smile. 😊

**Personality:**

- Don't compare your life to others'. You have no idea what their journey is all about.
- Don't have negative thoughts/things, invest your energy in the positive present moment.
- Don't overdo. Keep your limits.
- Don't take yourself so seriously. No one else does.
- Don't waste your precious energy on gossip.
- Dream more while you are awake.
- Envy is a waste of time. You already have all you need.
- Forget issues of the past. Don't remind your partner with his/her mistakes of the past. That will ruin your present happiness.
- Life is too short to waste time hating anyone. Don't hate others.
- Make peace with your past so it won't spoil the present.
- No one is in charge of your happiness except you.
- Realize that life is a school and you are here to learn.
- Problems are simply part of the curriculum that appear and fade away like algebra class but the lessons you learn will last a lifetime.
- Smile and laugh more.



## MALT &amp; MALT EXTRACT - BY MAHENDRA

## Introduction

Malt is the name given both to germinated grain, and to the sugar derived from it. The process of germinating ("sprouting") grain converts the starch to a mixture of sugars, thus increasing the sweetness, and the process is then halted by drying in a special kiln. The malted grain then used to add flavor and sweetness to beer, whisky, milkshakes and baked goods. Whoever thought of the process was clever, for sure. A second clever process extracts and concentrates the sugar into thick gloppy brown syrup quite suitable for eating directly from the jar - which is another excuse for buying a quantity. Not only is malt extract very delicious, it is also highly nutritious as it contains a lot of minerals, amino acids, folic acid, and B vitamins - a third reason for purchasing a jar. I can hardly wait to hire me off to the supermarket today.

## History of Malting

Malt, in substantially the same form as we know it today, was an important product long before the days of recorded history. Although its actual origin is buried in antiquity, there is a legend that early Egyptians manufactured malt by placing it in a wicker basket, which was then lowered into the open wells of that time. It was first lowered into the water for steeping, after which it was raised above the water level for germination. The rate of germination was controlled by adjusting the height of the basket within the well. As germination progressed and heat developed, the basket would be lowered to a lower temperature level thus retarding growth and dissipating heat. To accelerate germination, the basket was simply raised to a higher level. The malt was kept from matting by raising it to the top of the well and agitating the basket. Drying was by natural means, probably a simple process of spreading on the ground, and subjecting it to the direct rays of the sun. The use of malt at this time was thought to be exclusively for beverage purposes.

Of course, production of malt during this period was limited by the number of wells, and in efforts to increase production, maltsters next employed man-made cisterns and natural caves. These natural processes continued for centuries, because the next advancement in the malting process is found in the middle European countries. There, as the requirement for malt increased, it was found necessary to develop artificial means of controlling the temperatures and humidity.

The earliest known "malt house" was a simple structure located at the bottom of a hill or mountain adjacent to a stream, which could supply low temperature water by gravity. These houses had massive stone walls with floors of stone or mortar. Small windows set in these heavy walls were the only means of ventilation. Barley would be received into the top of such a house, and dropped into deep cisterns for steeping. From there, it would be deposited in a pile onto the stone floor of the house for germination. As growth commenced and heat was

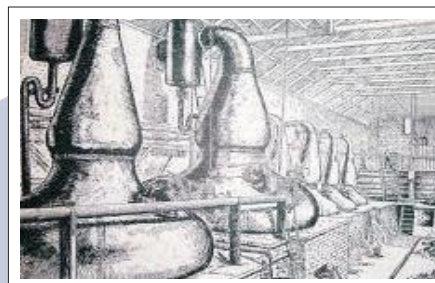
generated, the malt was shoveled from this pile and spread in a thin bed toward the front of the room.

Any necessary further cooling could only be accomplished during the cool evenings or night hours when experienced workmen shoveled the first thin layer of malt forward to another spot on the floor, throwing it into the air, and allowing it to fall in a thin shower. The proper moisture was applied by the simple old-fashioned sprinkling can. The process of shoveling to control temperature gradually moved the bed from the rear to the forward end of the floor, and as each successive steep was deposited onto the floor from the steeping cistern, it followed its predecessor down the length of the floor. In this way there were on each floor, a number of beds of malt in varying stages of germination. When the malt reached the front of the floor, its germination was completed, and it was shoveled by hand through a trap door into wheel barrows beneath, by means of which it was transported to the kiln for drying. The kiln, at that time, was simply a room with a tile floor, under which were crude furnaces.

The ceiling of the room assumed the shape of a high tapered dome, in which was located a large duct or chimney to pass off the moist hot air. After the germinated malt was spread on the floors, the fires were started, and drying accomplished by simple heating. The malt was agitated from time to time by a shovel. Later the tile floors were perforated, so that the combustion gases could pass directly through the grain. All ventilation was by natural draft, and, of course, was influenced greatly by weather conditions.

The art of malting under those conditions was one of the highest. The maltster personally controlled all processes, and through highly developed manual skill maintained proper conditions. He alone checked the temperatures, mostly by sense. It was he who determined when more moisture was required.

In short, it was exclusively his skill and experience which brought out a finished malt of the proper character. Because temperature controls were dependent on atmospheric conditions, malting at that time was confined to the cool months, which averaged about five months per year. During the rest of the year, the house was completely closed. Naturally, with this short production season, volume was very definitely limited.



improvement has been carried out in these field by integration of specialization in engineering, biochemistry, microbiology and organic chemistry and production capacity has increased many fold.

**Site directed mutagenesis :** Not all microorganism are cultivable by using common fermentable technology and not all enzymes found in nature are suitable for a certain synthetic problem - for example the enzyme activity, stability and substrate specificity are not always satisfactory. These limitations were often overcome by rational protein design when, if the gene encoding the enzyme and its three dimensional structures are available, mutation site can be identified followed by the introduction of appropriate amino acid by site directed mutagenesis meaning a single base change in the interested DNA sequence by deletion or insertion of an amino acid. Drastic changes has been made in the properties of enzyme by following this method.

**Directed Evolution:** This is actually an in vitro evolution manipulated by researcher in the direction of desired variant. Emerged during mid 1990s, also called molecular evolution is done in the test tube by random mutagenesis of the gene coding the enzyme followed by identifying the desired biocatalyst variant within these mutant by screening or selection. The possibility to dramatically change enzyme properties by directed evolution and gene shuffling, and other efficient methods, makes it feasible to use enzymes that are specifically tailored to their application and process conditions. We expect that enzyme technology is close to a major breakthrough, owing to the opportunities created by emerging technologies.

Thus, these methods are mainly contributing to technical and economic goals. However, the safety of enzyme manufacturing might also be improved by restricting to few well-known and safe-to-use production strains which are used as hosts for genes from various sources.

## AUTO BREWERY SYNDROME OR GUT FERMENTATION SYNDROME - BY P. SHALINI

The gut flora consists of microorganisms which live in the digestive tracts of animals and is the largest reservoir of human flora. Here gut means intestine and flora means micro biota and micro flora.

All the species living in the gut have not been identified as most of them cannot be cultured and identification is difficult. Most bacteria belong to the genera Bacteroides, Clostridium, Fusobacterium, Eubacterium, Ruminococcus, Peptococcus, Peptostreptococcus, and Bifidobacterium. Other genera, such as Escherichia and Lactobacillus, are present to a lesser extent. The currently known genera of fungi include Candida, Saccharomyces, Aspergillus, and Penicillium. Of all these, Candida is a common yeast in the environment, on our bodies and in our bodies. It competes for space with 'good' bacteria on the skin and anywhere that it is warm and moist- like the digestive tract. If the immune system is strong, the yeast is harmless and unnoticeable, but if the immune system is stressed, Candida can win the competition for space and cause infection. The existence of Candida infections like 'thrush' in the mouth is very common, but their occurrence in the intestine may be problematic. Many believe that Candida can also overgrow in the intestinal tract and cause symptoms that are commonly associated with so many chronic health problems today: fatigue, fuzzy thinking, body aches, chemical sensitivities and frequent infections are only some of the many complaints attributed to an 'Intestinal Candida Infection'.

## The Facts about Candida

The fact is, Candida can overgrow almost anywhere in the body and cause an infection. Candida species are the most common cause of invasive fungal infections in humans, producing infections that range from non life threatening mucocutaneous disorders to invasive disease that can involve any organ. An

unusual symptom of certain people with severe candidiasis is the presence of alcohol in the blood stream even when none has been consumed. First discovered in Japan, and called "drunken disease". This is a process well understood by distillers of homemade brew. These candidiasis patients whose yeast turns sugar into alcohol are chronically drunk. They have developed what is called as auto brewery syndrome

Interestingly, researchers studying these patients found that when they gave people who complained of 'Intestinal Candida' a sugary meal, there was a measurable increase in blood alcohol concentration. Starches and sugars that are not digested hang out in the gut and ferment. They create a toxin called Acetaldehyde. Acetaldehyde is typically a by-product of alcohol. Acetaldehyde does damage to the liver, pancreas, brain, nerves, muscles, metabolism, and neurotransmitters

Many of the symptoms exhibited in alcoholism such as insomnia, depression, loss of libido, headaches, sinusitis/post-nasal drip, digestion and intestinal complaints, overlap with those in Candida overgrowth. A medical test has been developed in which, after an overnight fast, the individual is given 100 grams of pure sugar. Blood samples taken both before the sugar loading, and an hour after, are measured for alcohol. An increase of alcohol indicates yeast "auto-brewery" intoxication. More studies showed that this ability to make alcohol after sugar administration went away and patients felt better after antifungal treatment and a low carbohydrate diet. Patients were treated based on this theory and became one of the most vocal proponents of the theory of Candida infection as the cause of these symptoms. But a specific organism has never been proven to actually be the CAUSE of this phenomenon, so researchers have not been so eager to call it 'Intestinal Candida'; instead, it was given the unusual name of 'Gut Fermentation Syndrome' or 'Auto Brewery Syndrome'.





## ACHIEVEMENT & AWARDS

### FOOD SAFETY MANAGEMENT SYSTEM (ISO 22000) - BY VINAY

Now a days food processing industries are also more concern about Food safety management system or more precisely ISO 22000. Now the question arise why this system so important globally as well as in Indian scenario. And more important what exactly it is all about? From several years quality assurance professional were using different tools for to assure the manufacturing process and overall product quality like TOTAL QUALITY MANAGEMENT (TQM), QUALITY MANAGEMENT SYSTEM (QMS), 5S etc. Then International Organization for Standardization introduces, FSMS (ISO 2200) which changes complete scenario of food manufacturing and processing industries.



#### INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote. Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. ISO 22000 was prepared by Technical Committee ISO/TC 34, Food products.

**SCOPE OF ISO 22000:** This International Standard specifies requirements for a food safety management system where an Organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. It is applicable to all organizations, regardless of size, which are involved in any aspect of the food chain & want to implement systems that consistently provide safe products. The means of meeting any requirements of this International Standard can be

accomplished through the use of internal and/or external resources. This International Standard specifies requirements to enable an organization

a) To plan, implement, operate, maintain and update a food safety management system aimed at providing products that, according to their intended use, are safe for the consumer

b) To demonstrate compliance with applicable statutory & regulatory food safety requirements  
c) To evaluate & assess customer requirements & demonstrate conformity with those mutually agreed customer requirements that relate to food safety, in order to enhance customer satisfaction

d) To effectively communicate food safety issues to their suppliers, customers & relevant interested parties in the food chain

e) To ensure that the organization conforms to its stated food safety policy  
f) To demonstrate such conformity to relevant interested parties  
g) To seek certification or registration of its food safety management system by an external organization, or make a self-assessment or self-declaration of conformity to this International Standard

All requirements of this International Standard are generic and are intended to be applicable to all organizations in the food chain regardless of size and complexity. This includes organizations directly or indirectly involved in one or more steps of the food chain. Organizations that are directly involved include, but are not limited to, feed producers, harvesters, farmers, producers of ingredients, food manufacturers, retailers, food services, catering services, organizations providing cleaning and sanitation services, transportation, storage and distribution services. Other organizations that are indirectly involved include, but are not limited to, suppliers of equipment, cleaning and sanitizing agents, packaging material, and other food contact

materials. This International Standard allows an organization, such as a small and/or less developed organization (e.g. a small farm, a small packer-distributor, a small retail or food service outlet), to implement an externally developed combination of control measures.

ISO 22000 integrates the principles of the Hazard Analysis and Critical Control Point (HACCP) system and application steps developed by the Codex Alimentarius Commission. By means of auditable requirements, it combines the HACCP plan with prerequisite programmes (PRP). Conducting a hazard analysis assists in organizing the knowledge required to establish an effective combination of control measures. ISO 22000 requires that all hazards that may be reasonably expected to occur in the food chain, including hazards that may be associated with the type of process & facilities used, are identified & assessed.

At the present time, the following standards will make up the ISO 22000 family of standards:

**ISO 22000** - Food safety management systems - Requires for any organization in the food chain.



**ISO 22001** - Guidelines on the application of ISO 9001:2000 for the food & drink industry.

**ISO / TS 22002** - Prerequisite programmes on food safety -Part 1: Food manufacturing.

**ISO TS 22003** - Food safety management systems for bodies providing audit and certification of food safety management systems.

**ISO TS 22004** - Food safety management systems - Guidance on the application of ISO 22000:2005

**ISO 22005** - Traceability in the feed and food chain - General principles & basic requirements for system design & implementation.

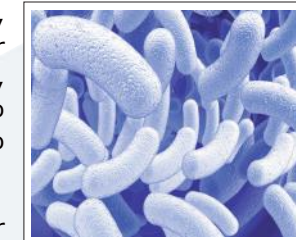
**ISO 22006** - Quality management systems - Guidance on the application of ISO 9002:2000 for crop production.

**ISO 22000** is also used in the Food Safety Systems Certification (FSSC) Scheme Fs22000. It is a Global Food Safety Initiative (GFSI) approved scheme.

## SOFT CORNERS

### MICROBES ARE FOUND EVERYWHERE IN THE WORLD - BY PRIYANKA

Microbes (also sometimes called "bugs") are microscopic organisms. They are very small. Fungi, bacteria, protozoa, and viruses are all different types of microbes. Even though you can't see them without a microscope, microbes are everywhere you go. Some microbes are bad, because they can cause diseases, but other microbes are good and helps people. For example, yeast is a helpful microbe that humans use to make breads. Other good microbes are used to make medicines for people and their animals.



Might E. Microbe (the "E" stands for "Environmental") and the Microbial Action Team are very good because they clean-up polluted water and soil. Different combinations of good microbes can help farmers grow bigger crops without fertilizers that harm the environment. Bacteria rule the world. No matter where you go or what you're doing, you cannot escape them. Nor would you want to. They're inside you, on every surface you touch, in the air you breath, and an integral part of every living thing around you. Without bacteria, life as we know it would cease to exist.

The more you learn about microbes, the more you'll appreciate them:

- 1) Microbes are the oldest form of life on Earth. They've been here for 3.8 billion years!
- 2) Microbes, by weight, represent 60 percent of the biomass of all life on Earth!
- 3) Microbes produce more than half of all the oxygen we breathe!
- 4) Microbes are the ultimate survivors: they are found just about everywhere on Earth!
- 5) A liter of coastal seawater can contain a billion or more microbes!
- 6) A single gram of soil can contain more than a billion microbes!
- 7) In the soil under your feet, there might be a million different types of microbes!

The right combinations of helpful microbes can eat pollution until the pollution disappears. Then the microbes disappear, because there's no more pollution for them to eat.

• Bacteria are constantly increasing their resistance to antibiotics which means that science needs to constantly develop new generations of more powerful antibiotics.

• It is estimated that worldwide nearly 50% of all antibiotics are used for veterinary purposes.

• Antibiotics should always been used in the correct way and only when necessary because using too much antibiotics decreases their effect and makes bacteria more resistant.

Bacteria have evolved resistance to every major class of antibiotics, and since new antibiotics are being developed very slowly it is vital to prolong the effectiveness of existing

drugs to treat bacterial infections.

• Bacteria are typically only a few micrometres in length but have a wide range of different shapes.

• There are around one million bacterial cells in a millilitre of fresh water.

• Bacteria have become very important for many branch of the industries, for instance, they play important role in sewage treatment as well as the production of cheese & yogurt through fermentation. Bacteria were the dominant form of life on our planet by more than 3 billion years.

• The most primitive form of oxygen-breathing bacteria appeared on our planet 2.48 billion years ago.

#### INTERESTING FACTS ABOUT MICROBES

- 1 Bacteria adapt properties allowing them to present a wide array of coloring.
- 2 Nearly a third of all bottled drinking water purchased in the US is contaminated with bacteria.
- 3 You are more likely to be struck by lightning than to be eaten by a shark. You are more likely to be infected by flesh-eating bacteria than you are to be struck by lightning.
- 4 The soft plastic headphones used on airplanes create a warm, moist environment in the ear canal that is ideal for breeding bacteria. Wearing headphones for just an hour will increase the bacteria in your ear by 700 times.
- 5 Researchers have revived a 250 million year old bacterium, Bacillus permians, that was discovered in salt crystals.
- 6 Diamonds are thought to be made from carbon and dead bacteria.
- 7 There are an estimated 75 to 100 trillion cells in the human body. It is believed by scientists that there are more bacteria in your body than the number of cells in your body.
- 8 Researchers have discovered that bacteria live and thrive in clouds.
- 9 Microbes from Mars may have traveled to Earth on Martian rocks that were strewn into space by meteor collisions.
- 10 Genetically altered bacteria could be used to create an environment on Mars that is similar to earth's environment.
- 11 Soap and water are more effective at killing germs than antibacterial hand sanitizes.
- 12 Bacteria, Wolbachia, has been known to change a sow bug (aka, pill bug, roly Polly) from a male to a female.