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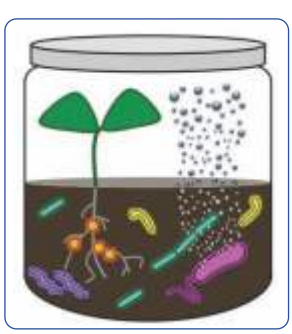

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MESSAGE FROM THE MANAGING DIRECTOR

Dear Friends,

When we began our journey 14 years back, we were few people in a small infrastructure, with hope, vision and positivity. With our efforts and honest attempts, we gradually captured a substantial part of Industrial Enzymes market in India. Since then, we have grown to become a leading player in the Industrial Enzymes market across various Industries in India and now spreading our wings to the International Arena.

Starting with a very few members, we have gradually reached to a rapidly evolving team of more than 100 employees. The start-up of Catalysts commenced with the dream of becoming a respected and recognized name in the industries of choice. We have many miles to go which we will achieve, by offering a strong platform to our team, who have the passion of achieving excellence. We have built an image of a reliable company; both by delivering quality products and services to our clients and partners.

As we are celebrating the 14th anniversary of Catalysts Group, I really feel proud and blessed when I look back at the journey of these significant and remarkable years. The reputation that we have earned is well-deserved as we have earned it through a lot of toil. For this, my sincere thanks to the loyal and incredible team.

Apart from this, we also have a powerful client base without whom our hard work and toil would be worthless. Our initial clients are still associated with us, which is a proof of our client retention level. Our sincere gratitude goes out to all our clients, old and new. Moreover, the appreciations and testimonials from the clients have also been an inspiring and stimulating spree.

Looking forward, I believe in seeing many more great experiences, rapid expansion, growth and excitement. We have been successful in meeting all challenges thrown at us over the last 14 years, and I trust our team will continue to perform in the same exemplary manner. Other than working hard, we must also promise to each other that we will carry on our trait of providing the customers maximum value and quality commitment. No doubt we will come across fresh challenges, but I believe in our compelling team to meet them successfully.

Let’s create a new Horizon for Catalysts together!

Thank you for helping make Catalysts a fantastic company today and for years to come!

Munish Madaan

MESSAGE FROM THE DIRECTOR

Dear Friends,

Wishing you and your family a very happy new year. We at Catalysts wish and pray for good health & happiness for all your loved ones.

We all wish & desire for happiness in life but mostly neglect the root reason to be happy which has been gifted to us by God forever, that's health. Health is something we always take for granted. We eat all sort of food to pamper our tasting buds but forget the load we are putting on the stomach. We even sometimes prioritise our work so much that we eat at odd timings, this too further puts stress on poor stomach. We tend to talk while eating, watch TV while eating and even do thinking work while eating all these activities distract our focus from eating and we forget chewing the food properly which again puts additional stress on the stomach.

Friends, this new year let's try to eat right food at right time in a right way so that stomach can digest it in the right manner. Let's walk more, work more, eat right, sleep right to be happy & be healthy.

Wishing you again a very Happy Healthy New Year !!

Cheers

Aditya Malhotra

Vision 2020

Catalysts vision is to be a rapidly growing organization and a happy workplace. An integrated biotechnology company; we will evolve as a globally recognized and valued brand. Catalysts will develop a business defined scalable infrastructure pan India and with Global footprints. World class manufacturing infrastructure and accredited research & development facilities will be created to meet the business requirement, for innovative products in existing and new customer base.

We will have a work culture of integrity, respect, team work, ownership, trust, learning and happiness for all stakeholders. Catalysts will be a process driven, professionally managed and people centric organization. We will create Catalysts as a high value business venture with an inclusive growth opportunity for all stakeholders.

Catalysts 14th Anniversary Celebration

Catalysts Family celebrated 14 years of experience in Industrial Enzymes business segment on Jan 7, 2017

The day witnessed lots of performances from employees and their families. Annual Award was given to employees for recognizing their contribution in the company.

Management of Wastewater in Distilleries: Legal and Policy Frameworks

Dr. B. Chandrashekhar, Research & Development Department

INDIAN DISTILLERY INDUSTRY

India is a major producer of Potable and Industrial Alcohol. The majority of distilleries use molasses as a feed stock and many distilleries are grain based. Apart from its use in beverage, medicines, pharmaceuticals and flavoring, alcohol constitutes the feed stock for a large number of organic chemicals which may be used in the production of drugs, rubber, pesticides and solvents. Ethyl alcohol is an important feed stock for the manufacture of various chemicals like acetic acid and butanol, butadiene, acetic anhydride, polyvinyl chloride etc. In terms of ethanol, India is the fourth largest producer of ethanol after Brazil, the United States and China and if the 5 percent blending of Petrol/Motor Fuel is made mandatory all over the country, the available molasses may be unable to meet the demand. Increments in both percent blending and geographical spread are anticipated.

WATER POLLUTION FROM DISTILLERIES

Molasses based distilleries are classified as a 'Red' category Industry by the Central Pollution Control Board. With the amount of highly polluting, spent wash being generated at 8 to 15 times the volume of spirit produced depending on the process, it is an area of major environmental concern. A recent report suggests that there are 325 molasses based distilleries in the country producing 3063 million litres/year (M L/year) of alcohol and generating 45945 M L/year of spent wash as waste annually.

In molasses based distilleries, average spent wash generation is lowest in the bio still process (6 to 8 liter per liter alcohol), higher in the cascade continuous process (8.5 to 11.0 liter per liter alcohol) and highest in the batch process (11.1 to 15.0 liters per litre alcohol). The concentration of pollutants is highest in the bio still process. Spent wash exhibits a very high level of Biological Oxygen Demand (40,000 to 65,000 mg/L) and Chemical Oxygen Demand (50,000 to 1,40,000 mg/L) with a high BOD: COD ratio. It is highly acidic with a pH of 3.0 to 4.5. The recalcitrant nature is due to the presence of melanoidins, caramel, polyphenols and a variety of sugar decomposition products such as anthocyanin, tannins and different xenobiotic compounds. The obnoxious odour may be due to the presence of skatole, indole and other sulphur compounds. Evaporated spent wash may contain a dry matter of about 30.5%. Spent wash also contains the major plant nutrients like phosporus, potassium, calcium, magnesium and Sulphur along with metal ions like zinc, iron, and manganese. Organic compounds extracted by alkaline reagents are reported to be of humic nature and similar to these in soil except folic acid which predominated over humic acid. Molasses based Brazilian distilleries also produce spent wash (vinasse) having a high organic matter content, high potassium (3.5 to 7.6 kg per m^3 of vinasse), relatively poor nitrogen (0.75 to 0.79 kg per m^3 of vinasse), phosphorous (0.10 to 0.35 kg per m^3 of vinasse) and magnesium (0.84 to 1.40 kg per m^3 of vinasse).

In grain based distilleries, the thin stillage obtained after ethanol recovery and decantation may be recycled to fermentation to reduce water consumptions in fermentation process. However, thin stillage is also fed directly to Multi-Effect Evaporator (MEE) to reduce the volume of the stream or fed to UASB for bio-methanation. The wet grains obtained from grain based distilleries may be fed to livestock directly or they can be dried to produce Dried Distillers Grain (DDG). Thin stillage can be sold as high-moisture feed or it can be dehydrated to produce condensed distillers solubles (CDS, also called syrup). Condensed distillers solubles and distillers grain are often blended together to prepare wet or dried distillers grain and solubles (WDGS or DDGS). For example, one tonne of corn produces 378 L of ethanol and 479 kg WDG (70% moisture content), or 309 kg of DDGS (10% moisture content). One tonne of wheat produces 372 L of ethanol and 457 kg WDG (70% moisture content), or 295 kg of DDGS (10% moisture content).

The stillage is separated from ethanol after the fermentation process, with 0.8 kg total solids (TS) stillage (5–10 L) effluent being produced per liter of bio-ethanol. Stillage consists of materials which are not degraded during hydrolysis and bio-ethanol fermentation, such as high concentrations of proteins, amino acids, smaller amounts of sugars and yeast cells with COD value up to 40,000 mg/L which must be treated. Stillage is energy-rich (13.6 MJ kg−1 TS) and has been shown to be appropriate as feedstock for bio-methanation. Thin stillage used as feedstock for biogas production has a methane potential of 10.4 MJ kg−1 chemical oxygen demand (COD). Bio-methanation is followed by extended aeration, clarification and finally stored in lagoons used for ferti-irrigation as par the Corporate Responsibility for Environmental Protection (CREP).

ENVIRONMENTAL IMPACTS OF DISTILLERY SPENT WASH

The discharge of this highly polluting effluent to river streams and other water bodies causes immense damage to the flora and fauna. The high COD, total nitrogen and phosphate contents of spent wash can result in eutrophication of natural water bodies. Spent wash discharge has a highly deleterious effect on fish life. Spent wash also contains significant amounts of recalcitrant compounds which severely pollute the receiving bodies of water and present a serious health hazard to the rural and semi-urban population that depend on such water bodies for drinking water and other requirements. Waste waters are also a source of greenhouse gas emissions (CO_2, Methane and Nitrous Oxide). Obnoxious odors and leaching into ground water are also major concerns. It was once regarded as the Environmentally most obnoxious industry.

Unregulated wastewater flowing out from a distillery industry

LEGAL AND POLICY FRAMEWORKS IN INDIA

About 13,500 MLD of wastewater is generated by industries in India of which only about 60% is treated. The CPCB has developed detailed industry specific discharge standards for 104 categories of industries. Enforcement rules, often backed up by court rulings, allow for shutting down industries that are out of compliance. This measure has been instrumental in improving effluent treatment performance by industries, as compared to municipal STPs. However, concerns remain about inadequate monitoring and enforcement resources at the SPCBs. Policy analysts have pointed out that the current enforcement model is inefficient in that it only allows for drastic action, e.g. shutting down, for grave non-compliance. Instead, they have urged the CPCB to move towards a market-based system of fines/levies based on the amount of pollutant discharged which will act as an incentive for industries to continuously decrease their effluent discharges; shutting down may be reserved for extreme violations. However, such a change not only needs administrative reorganization but also more accurate monitoring mechanisms.

In light of increasing water scarcity in India, several recent policy documents from the government have started emphasizing water conservation and end use efficiency, correct water pricing, and reuse and recycling. The National Water Policy of 2012 encourages recycling and reuse of water after treatment to specified standards as well as preferential tariffs that incentivize treated wastewater over freshwater. However, there are no specifics on legal frameworks or implementation mechanisms. In several parts of the country, local governments earn revenue by selling treated or untreated sewage to local farmers; there are many instances of industries selling or giving away their treated effluent to local farmers as well. Perhaps the best formal arrangement in India can be seen at Chennai Metro Water, which earns Rs. 12 crores a year from selling treated wastewater and covers its entire operating cost.

Therefore, the most sustainable and relevant policy for distillery wastewater reuse is the CPCB standards for land application of treated wastewater for irrigation. While the general discharge standards for discharge into surface waters cover 33 parameters, those for land application for irrigation only cover, including suspended solids, pH, and BOD. In addition, for each industry specific discharge standard, there are standards for land application, although like in the case of the general standards, only limited parameters are covered.

For example, the discharge standards for the fermentation industries (breweries/distilleries) only specify a standard for BOD for land application. The rich nutrient contents of spent wash make its use in agriculture very viable. Pre-sown land application, bio-composting and ferti-irrigation have been variously applied. These technologies had been accepted for implementation through the Charter for Corporate Environmental

Responsibility decided between the CPCB and Distillers. The rich nutrient contents of spent wash from molasses distillery make its use in agriculture very viable. It has also been estimated that utilization of spent wash may provide 5 trillion K Cals energy as biogas annually and the post-methanated effluents can provide 2,45,000 tons of Potassium, 12,500 tons of Nitrogen and 2,100 tons of Phosphorous annually and one year's effluents can meet the Potassium requirement of 1.55 million hectare land, Nitrogen requirement of 0.13 million hectares and Phosphorous requirement of 0.025 million hectare lands if two crops are taken in a year.

Bottlenecks in policy implementation and solutions

A lack of comprehensive standards and policy framework is hindering the development of a formal market, appropriate technology and sustainable business/financial models. Despite the presence of standards, land application of distillery wastewater for irrigation is almost completely unmonitored and unregulated given the inadequate resources of SPCBs who can barely monitor air and water discharges of regulated industries. As a result, use of untreated or inadequately treated wastewater for irrigation is widely practiced, with questionable impacts on public health and the environment.

In addition to comprehensive standards by the central government, local Water Users' Authorities (WUA) comprising of diverse stakeholders can be established to set tariffs and monitor allocation and use, as suggested by the National Water Policy. There is a need to use a mix of treatment options with adequate protocols and guidelines so that spent wash can be gainfully utilized for biogas generation, bio-compost, ferti-irrigation, one time land application, irrigation, sodic land reclamation and co-processing. The distillery industry is advised to treat its effluent to achieve zero discharge as no liquid discharge is allowed either on land or in any water body. After thorough study of the processes and technologies, the industry should adopt any one or combination of 2-3 technologies recommended by the Charter on Corporate Responsibility for Environmental Protection (CREP) for distilleries.

Nevertheless, distilleries need environmentally sound technologies, best practices and more effective policies to manage effluents. By putting dedicated efforts into research and development by both industries and academia, the wastewater generated from distilleries may be used as a raw material for production of several value-added products. The spent wash after biomethanation consists of ammonia which can be recovered through various approaches. For example, the ammonia may be precipitated as fertilizer struvite by dosing phosphate and magnesium. Both molasses and grain based distilleries can achieve zero-discharge limits by employing multi-effective evaporation. However, the MEE condensate contains high concentration of volatile acids, which make it unfit for complete recycle. Efforts should be made to utilize the volatile acids as a raw material for other value added products such as biogas and organic polymers. In this way the distilleries can add commercial value to the wastewater, while also recycling it into the process. Priority must also be given to make tangible environmental standards after doing industry specific research, which will be more instrumental in prevention of pollution from distilleries.

Microbial Cellulose: A Cost Effective New Era Biopolymer

Rakesh Joshi, Research & Development Department

Cellulose is the earth's major biopolymer and is of tremendous economic importance globally. Cellulose is the major constituent of cotton (over 94%) and wood (over 50%). Together, cotton and wood are the major resources for all cellulose products such as paper, textiles, construction materials, cardboard, as well as such cellulose derivatives as cellophane, rayon and cellulose acetate.

Traditionally, cellulose is harvested from plant resources. Bolls from cotton plants are collected, and the cotton fibers are detached from the seeds and processed into bales. In Texas alone, the 1992 cotton crop produced $1.0 billion in cash receipts and had an economic impact of $4.0 billion. The 1985 global production of cotton was approximately 17,540,000 tons.

Wood timber is cut from the forest and sent to the saw mill for cutting and drying. Trees also are transported to the paper mill where the wood is shredded into chips which are then processed into a thick, watery pulp. This process requires energy and chemicals often harmful to the environment since unwanted lignin must be removed and the cellulose must be bleached. Pulp is made into paper and cardboard. In the United States alone, more than two million tons of newsprint and writing paper are produced each year from pulp. The forest products industry in the United states is a $70. Billion/year industry, not insignificant in relation to other major industries. In 1985, the world production of pulp reached 140 million metric tons.

With our increased population explosion and the quest to continue using cellulose crops from wood and

cotton, more land is required to meet the global demand. This has a direct impact on the earth's carbon cycle.

In this context, we need to understand cellulose in terms of the global carbon cycle as well as its use by humans. The carbon cycle on earth is a vast interplay between the CO_2 of the atmosphere and its sequestration or "fixation" via photosynthesis into organic products, among which cellulose is the most abundant macromolecule on earth. Over 10-11 tons are estimated to be synthesized and destroyed annually on earth. Cellulose can be thought of as a giant carbon "sink" because carbon incorporation into cellulose remains in the product for a rather lengthy time, sometimes for thousands of years. The global warming cycle affected by the emergence of the industrial age is based, in part, by the release of CO_2 into the atmosphere through the burning of wood and hydrocarbons. This emerging problem could have immense consequences if the carbon dioxide content continues to rise and trap heat from the sun's irradiation. Thus, one long term alternative is to reverse this conversion by increasing photosynthesis which results in the trapping of more carbon dioxide. Harvesting huge acreage of trees is neither contributing to the ecological management of the photosynthetic potential, nor maintaining a global sink for Co_2.

SOURCES OF CELLULOSE

Cellulose from such major land plants as forest trees and cotton is assembled from glucose which is produced in the living plant cell from photosynthesis. These are macroscopic, multi cellular photosynthetic plants with which we are all familiar. In the oceans, however, most cellulose is produced by unicellular plankton or algae using the same type of carbon dioxide fixation found in photosynthesis of land plants. In fact, it is believed that these organisms, the first in the vast food chain, represent Nature's largest resource for cellulose production. Without photosynthetic microbes, all animal life in the oceans would cease to exist.

Several animals, fungi, and bacteria can assemble cellulose; however, these organisms are devoid of photosynthetic capacity and usually require glucose or some organic substrate synthesized by a photosynthetic organism to assemble their cellulose. Some bacteria can utilize methane or sulfur substrates to produce glucose and other organic substrate for cellulose.

ACETOBACTER XYLINUM- A RICH SOURCE OF PURE CELLULOSE

Among the bacteria, one of the most advanced types of purple bacteria is the common vinegar bacterium, Acetobacter. This non-photosynthetic organism can procure glucose, sugar, glycerol, or other organic substrates and convert them into pure cellulose. Acetobacter xylinum is Nature's most prolific cellulose-producing bacterium. A typical single cell can convert up to 108 glucose molecules per hour into cellulose. Consider that as many as a million cells can be packed into a large liquid droplet, and if each one of these "factories" can convert up to 108 glucose molecules per hour into cellulose, the product should virtually be made before one's eyes.

A single cell of Acetobacter has a linear row of pores from which glucan chain polymer aggregates are spun. As many as one hundred of these pores can produce a composite cable of glucan polymers resulting in a ribbon. Time lapse analysis of individual Acetobacter cells assembling cellulose ribbons reveals a myriad of activities, each cell acting as a nano-spinneret, producing a bundle of sub-microscopic fibrils. Together, the entangled mesh of these fibrils produces a gelatinous membrane known as a pellicle. This membrane of pure cellulose, and cells entrapped within it can be cleaned and dried and the product used for many exciting new applications. One of the unique features of this pure cellulose membrane is that it is very strong in the never dried state, and it can hold hundreds of times its weight in water. This great absorbtivity and strength constitute two of the many novel features of microbial cellulose.

UNIQUE MICROBIAL CELLULOSE FEATURES AND PRODUCTS

The microbial cellulose ribbons are "spun" into the culture medium, membranes and shaped objects can be produced directly during the fermentation process, thus enabling a novel array of non-woven products. Direct dyes can be added during synthesis to alter the cellulose produced. Because of the novel features of microbial cellulose, a variety of product applications of microbial cellulose is possible.

THE FUTURE-WHAT DOES IT HOLD FOR MICROBIAL CELLULOSE?

It seems clear from this brief presentation of product diversity from microbial cellulose that this source of Nature's abundant biopolymer would have been used much earlier; however, the drawbacks have centered on understanding the biosynthetic process itself, then trying to optimize the fermentation process leading to more cells and cellulose biosynthesis.

FERMENTATION OPTIMIZATION

Several routes to fermentation are available. The first is a "deep tank" fermentation which is very similar to large scale industrial fermentor now in operation. In the United States, Weyerhaeuser spent a number of years developing microbial cellulose production in such fermentors; however, their commercial product Cellulose never really obtained commercial success because cost reductions to make this product competitive with other sources of cellulose never were realized. Approximately two years ago, Weyerhowser advertised to sell its cellulose business, this being indicative of the perils and pitfalls for entering into such a business without sufficient fundamental R & D to provide a basis for optimal and economical production. The Cellulose business was sold to Kelco, Inc. a company experienced in large scale fermentation of bacterial products. Kelco is perhaps best known for its commercial production of the bacterial polymer. xanthan gum, used as a food thickener. Recently Kelco, the subsidiary of Merck, was purchased by Monsanto, an agriculturally based company. Thus, with Monsanto's renewed interest in the biopolymer field, an opportunity for expanding microbial cellulose production now exists in the U.S; however, significant gains will be necessary in fermentation

upgrading using the deep tank methodology.

The static culture method, on the other hand, is more likely to succeed because microbial cellulose has been produced this way for many years in the Nata industry, and the low shear forces in static culture promote higher productivity. Because microbial cellulose is an extracellular product which is excreted into the culture medium, special care and handling is necessary to maintain optimal production. The cellulose membrane itself can become a barrier for substrates and oxygen necessary for the cells to produce cellulose. Thus, in our laboratory during the past 5 years, novel fermentation approaches have been developed to overcome some of the intrinsic difficulties for mass culture of Acetobacter. Furthermore, a vigorous program of bacterial strain selection from regions all over the world has provided a stock resource of stable, efficient cellulose-producing strains. The recent success with cloning and sequencing the genes for bacterial cellulose synthesis combined with new information on how these genes may function in vivo gives new input on further optimization.

What is needed at the present is development of intermediate fermentation scale-up so that the conversion to an efficient large scale fermentation technology will truly deliver microbial cellulose to the market at a competitive cost. However, when large scale fermentation does become a reality, the future economies of scale could lead to a major new industry as a new source for an important biopolymer which has been used for centuries.

CONCLUSIONS

In the era of declining forests, global climate changes, continuing expansion of industrialization, it is reasonable to consider the consequences of an alternative source of cellulose. Thus, we return to our original idea of what if's and other questions in the prediction of scenarios for the future of native biopolymers. The process for success depend on education-the public needs to become better educated on all aspects of cellulose, ranging from its fundamental biosynthesis, structural properties, to the biotechnology applications. Education and communication among professionals also is necessary. It takes an international collaboration of scientists from many fields, including botany, microbiology, chemical engineering, forestry, mechanical engineering, polymer science, textiles, food products, marketing, economics, and business to fully realize the merits of a new resource for a widely used product. This is an excellent opportunity to take advantage of new development since the intense interest in Nata and other microbial cellulose products now is fueled by the demand for the product. It is ironical that demand now outpaces the supply for microbial cellulose, largely because of lack of investment in fermentation R&D to optimize microbial cellulose production on a large scale.

Reference: R. Malcolm Brown, Jr. Department of Botany, the University of Texas at Austin, Austin, Texas 78713-7640

Beer and its Nutrients

Beer is an alcoholic beverage which are produce from barley malt, water, hops and yeast.

The Brewing process involve extraction and degradation of carbohydrates and proteins from barley malt and adjunct to make a sugar solution.

In this process. The barley malt, which is the sources of starch and enzymes is degraded in to simple sugar by enzymatic reaction which further ferment to produce alcohol and carbon dioxide with varieties of ester flavor's, Hops is a special flavor and aroma of Beer giving the refreshing taste.

Barley malt (Starch and Proteins source) —(Enzymatic reaction)→ Simple Sugar + Amino Acid

Simple Sugar + Sterile O_2 —(Yeast)→ Alcohol + CO_2 + Esters (Flavors) in traces

.

Beer was introduced into India by the British, who eventually set up a brewery that produced Asia's first beer -- a pale ale called Lion. However, these days, lager is the only type of beer you'll find available in India. It comes in two strengths - mild (around 5% alcohol) and a generous strong (6-8% alcohol).

Depending on the place, a large 650 ml bottle of beer will cost you between 50-70 rupees ($1-1.50) at a liquor store and double or triple that at a bar.

The Liquor consumer Manipur is quite high despite of banned by Government and Local Organization. Since Beer content alcohol of lesser percentage, it is coming under liquor. However, seeing its nutrient value, beer can be considered as Food.

BEER AND NUTRITION

You don't usually see those two words together, but perhaps beer is a bit misunderstood. It may actually be good for you when consumed in very moderate amounts.

Part of a Healthy Diet

Drinking one-pint bottle beer (350 ml approx.) per day may be good for your health because it has been associated with a lower risk of cardiovascular disease. Why?? Some experts suggest these reasons:

- The folate found in beer may help to reduce homocysteine in the blood and lower homocysteine levels mean a lower risk of cardiovascular disease.
- Lab studies have found constituents in beer that lower triglycerides and LDL-cholesterol in mice.
- Drinking one beer per day reduces blood clotting so some studies found that cardiovascular patients who drank one beer per day also lived longer.

Other studies have also found that women who consume one beer each day have improved mental health. Drinking beer and other alcoholic beverages in moderation may also improve bone density.

The benefits of beer nutrition probably have nothing to do with the alcohol and there are some low-alcohol beers and non-alcohol beers available which offer the same heart-protective effect as regular and light beers.

According to the USDA National Nutrient Database, one 12-ounce (1-pint bottle) serving of regular beer has the following nutrients:

Nutrients	Amounts
Calories	153
Proteins	1.64 g
Carbohydrates	12.64 g
Calcium	14 mg
Magnesium	21 mg
Phosphorus	50 mg
Sodium	14 mg
Zinc	0.04 mg
Thiamin	0.018 mg
Riboflavin	0.089 mg
Niacin	1.826 mg
Pantothenic Acid	0.146 mg
Vitamin B6	0.164 mg

Beer is actually a good source of Folate, Magnesium, Potassium and Niacin.

However, there are few peoples who are **not advise to drink Beer**

- Pregnant or breast-feeding women should not drink beer. Even small amounts of alcohol can damage a developing fetus.
- People with alcoholism or drug addictions should not drink beer
- Under aged young people. Govt. of India has given restriction as below 18 to 21 years.
- People with liver, pancreatic diseases, or really, any type of chronic disease should speak with their doctor
- People with gout should avoid beer. Gout is very painful and is triggered by alcohol.
- Diabetics should speak with their doctor
- People taking any type of medications should speak with their doctor. This includes over-the-counter medications.

BEER & YOUR HEALTH

Meanwhile, the medical profession faces its own dilemma: Is it ethical to advocate drinking alcoholic drinks; Or is it ethical not to when the benefits are well established?

With that in mind, we have tried to stick with the facts:

- 95 % of beer components is water
- Beer has no fat
- Beer has low sugar approx. 0.15 -0.2 gm's/350 ml of beer
- Beer is a source of soluble fiber which is derived from the cell walls of malted barley. A litre of beer contains an average of 20% of the recommended daily intake of fiber and some beers can provide up to 60% depend upon the barley malt composition. As well as aiding healthy bowel function, this has a further benefit by slowing down the digestion and absorption of food and reducing cholesterol levels, which may help to reduce the risk of heart disease. Beer itself has no cholesterol.

Moderate levels of consumption of beer have been shown to reduce stress and the chances of heart disease.

Taking aside of above positive points, lets discussed about few negative point.

1. Alcohol can cause blood sugar levels to drop more rapidly. That can stimulate your appetite, and disrupt your ability to tell when you've had enough to eat. This can also create fatigue and your energy level will suffer.
2. Because alcohol interferes with the body's absorption of vitamins and minerals, it can lessen the body's ability to burn stored fat. Calories from alcohol may go right to your stomach. Also, alcohol is detoxified by the liver. In the process of metabolizing excess quantities of alcohol, the liver swells and may itself become filled with fat. All these factors contribute to what is known as a "beer belly."
   Example: A 5.9, feet, 160-pound, 30-year-old man must walk only about 40 minutes at 3 miles per hour (moderate pace) to burn 150 calories.
3. Alcohol destroys Vitamin C and Vitamin B complex. Drinking beer that has not filtered out the Vitamin B (such as English "real ale," many micro brewed beers and homebrew) will help combat the effects of alcohol-most notably a hangover.

Seeing the above point, why can't beer be a health drink if the percentage of alcohol is reduced to lower side

Use of Enzymes in Pharma Industry

Manav Prakash Sharma, Quality Control Department

Enzymes as drugs have two important features that distinguish them from all other types of drugs. These are proteinaceous in character. Each enzyme is programmed to carry out one special task. First, enzymes often bind and act on their targets with great affinity and specificity. Second, enzymes are catalytic and convert multiple target molecules to the desired products. These two features make enzymes specific and potent drugs that can accomplish therapeutic biochemistry in the body that small molecules cannot. These characteristics have resulted in the development of many enzyme drugs for a wide range of disorders. The manufacturer or processing of enzymes for use as drug is an important facets of today's pharmaceutical

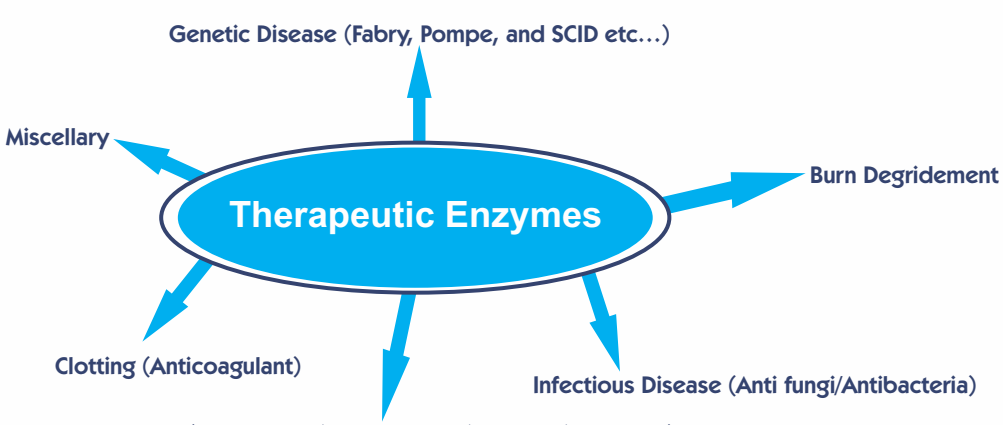

Figure: Therapeutic enzymes are used in the treatment of a variety of disorders and diseases

industries.

The application of enzyme technologies to pharmaceutical research, development and manufacturing is a growing field. John Beard, an English scientist, was first to use pancreatic enzymes to treat cancer in 1902. He proposed in 1906 that pancreatic proteolytic enzymes represent the body's main defense against cancer. There are several studies from 1960. Another example, a therapeutic enzyme was described as part of replacement therapies for genetic deficiencies in the 1960s by de Duve. In 1987, the first recombinant enzyme drug, Activase (alteplase; recombinant human tissue plasminogen activator), was approved by the Food and Drug Administration (FDA). This 'clot-buster' enzyme is used for the treatment of heart attacks caused by the blockage of a coronary artery by a clot. Since the later year of the 19th century, crude proteolytic enzymes have been used for gastrointestinal disorders, examples., pepsin for dyspepsia. Dr. Edward Howell introduced the term enzyme therapy to the United States in 1920s.

Milestone study gradually opened up the way for the use of parental enzymes first in the treatment of infections, then of cancer, and finally of a diverse spectrum of disease. Enzyme supplement are available pills, capsules and powder.

To be effective as therapeutic/drug agent, the enzymes must meet a number of requirements:

1. They must reach their site of action in the body and tissue compartment
2. They must be active under the conditions present at the intended site of action. This includes substrate and coenzyme availability, appropriate redox potential, adequate pH value for activity and absence of inhibitors
3. They must be sufficiently stable to ensure adequate pharmacokinetics, i.e., the required activity level for the necessary time period.
4. They must sufficient soluble to allow application as a solution if administration is via intravenous, intramuscular, or subcutaneous route
5. They must be sufficiently pure to avoid eliciting unwanted side reactions caused by contaminants, e.g., microbial endotoxins, pyrogens, or other harmful materials
6. There must be a therapeutic effect that depends on the particular activity of enzymes applied

SOME IMPORTANT THERAPEUTIC ENZYMES

Enzyme	EC number	Reaction	Use
Asparaginase	3.5.1.1	L-Asparagine H_2O → L-aspartate + NH_3	Leukaemia/Antitumor
Collagenase	3.4.24.3	Collagen hydrolysis →	Skin ulcers
Glutaminase	3.5.1.2	L-Glutamine H_2O L-glutamate + NH_3	Leukaemia/Antitumor
Hyaluronidase	3.2.1.35	Hyaluronate hydrolysis	Heart attack
Lysozyme	3.2.1.17	Bacterial cell wall hydrolysis	Antibiotic
Rhodanase	2.8.1.1	$S_2O_3^{2-}$ + CN^- → SO_3^{2-} + SCN^-	Cyanide poisoning
Ribonuclease	3.1.26.4	RNA hydrolysis	Antiviral
Lactamase	3.5.2.6	Penicillin → penicilloate	Penicillin allergy
Streptokinase	3.4.22.10	Plasminogen → plasmin	Blood clots
Trypsin	3.4.21.4	Protein hydrolysis	Inflammation/used to remove dead tissue cells that remain after trauma,

Uricas (Urate Oxidase) Urokinase Lipase Bromelin Chymotrypsin	1.7.3.3 3.4.21.31	Urate + O_2 → allantoin Plasminogen → plasmin Lipid Hydrolysis Protein Hydrolyis Protein Hydrolyis	infection or surgical procedures Gout Blood clots Digests Lipids Digest protein Anti-inflammatory and antioxidant, which are all thought to reduce tissue destruction

There are 22 different types of enzymes produced in the body, primarily by the pancreas and this production diminishes as we age. The three basic digestive enzymes are amylase, lipase and protease which breakdown carbohydrates, fats and proteins. Additionally, cellulose and lactose break down fiber and dairy. These enzymes work in the stomach during the period of pre-digestion; however, when food is cooked or processed its naturally occurring enzymes are destroyed. Consuming denatured food overburdens the body as it taps into its ever-decreasing enzyme supply in an effort to complete the pre-digestion process.

Urate Oxidase

It is necessary for dietary ingestion of nucleic acids. In the absence of urate oxidase cells produce urate (instead of ureate) and transport it to the plasma. From the plasma, it is secreted into the urine (hyperuricemia). Chronic increase of urate in the plasma is responsible for gout. An acute increase in plasma levels (e.g., after chemotherapy) results in acute renal failure due to the precipitation of urate in renal tubules. Urate oxidase treatment is used for preventing acute hyperuricemia in urate oxydase deficient patients in the course of chemotherapy. 5-hydroxyisourate is instable and form water-soluble allantoin spontaneously. Therefore, to prevent acute renal failure it is enough to degrade urate in the plasma and urate oxidase does not need to enter the cells.

Bromelin

It is one of the most popular enzymes used in enzyme therapy. Bromelain is classified as an herb and contains a photolytic digestive enzyme that comes from the stem and the fruit of the pineapple plant. When taken with meals, bromelain may aid in the digestion of proteins. When taken on an empty stomach, it may act as an anti-inflammatory agent.

Trypsin

It is a proteolytic enzyme, is also used in enzyme therapy. When taken orally, it is often used for digestive enzyme supplementation, often in combination with lipase and amylase. It has also been combined with bromelain and rutin to treat osteoarthritis. Trypsin may be used topically to remove necrotic tissue and debris during wound and ulcer cleaning. Trypsin supplements are derived from fungi or bacterial sources, pancreas of livestock or from plant sources. It may be used to remove dead tissue cells that remain after trauma, infection or surgical procedures. This removal allows new skin or tissue cells to grow.

Chymotrypsin

It has been used orally to reduce inflammation and edema (swelling) associated with abscesses, ulcers,

surgery or trauma. This enzyme is also used as an expectorant in asthma and other pulmonary diseases, and in reducing liver stress. Topically, it is used for inflammatory and infectious disorders. It can also be used as an inhalant, intramuscular injection or opthalmically. It has ingredients that are proteolytic, anti-inflammatory and antioxidant, which are all thought to reduce tissue destruction.

Evidences of enzyme used as medicines for various diseases:

1. **BROMELAIN**

   Several preliminary studies suggest that when taken by mouth, bromelain may reduce inflammation or pain caused by inflammation, although better quality studies are needed to confirm these results. It is proposed that bromelain may be a useful addition to other therapies used for sinusitis (such as antibiotics) due to its ability to reduce inflammation and swelling. Studies report mixed results, although overall bromelain appears to be beneficial for reducing swelling and improving breathing in patients with sinusitis. A bromelain-derived debriding agent, Debridase®, has been studied on deep second degree and third degree burns with positive results, but further results are needed to confirm these preliminary results. Moreover, there is not enough information to recommend the use of bromelain in the treatment of cancer, either alone or in addition to other therapies. Although bromelain is an enzyme with the ability to digest proteins, there is little reliable scientific research on whether bromelain is helpful as a digestive aid.

2. **PANCREATIC ENZYME THERAPY**

   The theory behind pancreatic enzyme therapy is to restore normal gastrointestinal physiology as completely as possible by supplementing deficient pancreatic enzymes. Pancreatic enzyme therapy such as the prescription product Pancrease®, is commonly used to treat pain associated with chronic pancreatitis. However, some studies have found no significant benefit of the therapy to relieve pain associated with chronic pancreatitis. Scientific research suggests that chronic pain may be reduced with other forms of alternative medicine. For example, bromelain, hypnosis and therapeutic touch have been proven to effectively treat symptoms of pain. Although administration of large amounts of proteases as enzyme therapy has provided pain relief in some pancreatitis patients, the rationale for using enzymes to relieve pain in chronic pancreatitis has not been generally accepted. Administered enzymes may be destroyed by gastric acid, resulting in malabsorption of the enzymes. Also, acidic conditions in the duodenum decrease the efficacy of pancreatic enzymes administered with meals. Histamine-H2-receptor antagonists may decrease gastric acidity but there are certain drawbacks to long-term use of these agents. The use of enteric-coated microspheres overcomes many of the problems associated with enzyme destruction. Patients with chronic pancreatitis display considerable individual variation in their treatment requirements. Therapy must be tailored to meet the need for adequate disease control as well as for social and emotional acceptability by the patient. The attending physician and the patient share the responsibility for maintaining appropriate therapy.

3. **FABRY'S DISEASE**

   Fabry's disease (also known as Anderson-Fabry disease, Angiokeratoma corporis diffusum and ceramide trihexosidosis) is a rare, X-linked inherited lysosomal storage disease. A deficiency of the enzyme alpha galactosidase causes a glycolipid (ceramide trihexoside) to accumulate in blood vessels and other tissues and organs, impairing their function. Some of the pathological symptoms include skin lesions, episodes of fever and burning in the extremities. The skin lesions present as painless, elevated bumps that appear all over the body. Ocular involvement may also be present. The disease, if untreated, results in death in early adulthood, usually due to renal failure because of proteinuria (protein in the urine) induced hypertension. Enzyme replacement using agalsidase alpha (Replagal®) and agalsidase beta (Fabrazyme®), is now used to treat this disease, but remains problematic due to the cost (about $170,000/year/patient).

4. GAUCHER DISEASE

Gaucher disease is a common lipid storage disorder caused by a deficiency of the enzyme glucocerebrosidase, leading to an accumulation of its substrate, a fatty substance called glucocerebroside. Symptoms may include enlarged spleen and liver, liver malfunction, skeletal disorders and bone lesions that may cause pain, severe neurological complications, swelling of lymph nodes and occasionally adjacent joints, distended abdomen, a brownish tint to the skin, anemia (low iron), low blood platelets and yellow fatty deposits on the white of the eye (sclera). Enzyme replacement treatment with recombinant glucocerebrosidase enzyme, 60 units/kg, has been given intravenously every two weeks to decrease liver and spleen size, reduce skeletal abnormalities, and reverse other manifestations of the disease.

5. LYSOSOMAL STORAGE DISORDERS

Enzyme replacement therapy for the lysosomal storage disorders derives its momentum from the successes achieved in the treatment of Gaucher disease. The development of enzyme replacement therapy for Gaucher disease may possibly be applicable to other lysosomal storage diseases

6. LYMPHATIC EDEMA

A study evaluating the contribution of proteolytic enzymes used in the treatment of the lymphatic edema (swelling) of the arm after mastectomy and radiotherapy for breast cancer showed that proteolytic enzymes were successfully administered in monotherapy of lymphatic edema as well as supportive therapy.

7. TUMORS

The clinical responses to the enzyme L-asparaginase led to renewed interest in other enzymes that might be effective antitumor agents. Biochemical and nutritional studies on animal and human tumors have shown that enzymatic depletion of glutamine, arginine, cysteine, citrulline, and serine could have selective cytotoxicity for some tumors. Several glutaminase-asparaginase enzymes may have antitumor activity in animals and man. These enzymes are currently in phase I trials, and the exact type of tumors they work on is yet to be determined. Arginine-depleting enzymes with suitable properties of therapy have been developed and are in preclinical study. Based on the available research, no enzyme has been found that can adequately deplete circulating levels of cysteine, citrulline, or serine for treatment of cancer.

8. WOUND DEBRIDEMENT

Enzyme therapy, the application of microbial proteases in particular, is one way of removing necrotic tissues from purulent, or discharging, wounds. The use of proteolytic enzymes combined with the methods of early closure of granulated wounds considerably may reduce the terms of treatment of patients with purulent wounds.

Reference:

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3. Indian Journal of Biotechnology Vol 2, July 2003, pp 334-341Sources, Properties and Applications of Microbial Therapeutic Enzymes
4. The fresh carrot, natural standard-Enzyme therapy

Gas Sensors 'see' Through Soil to Analyze Microbial Interactions

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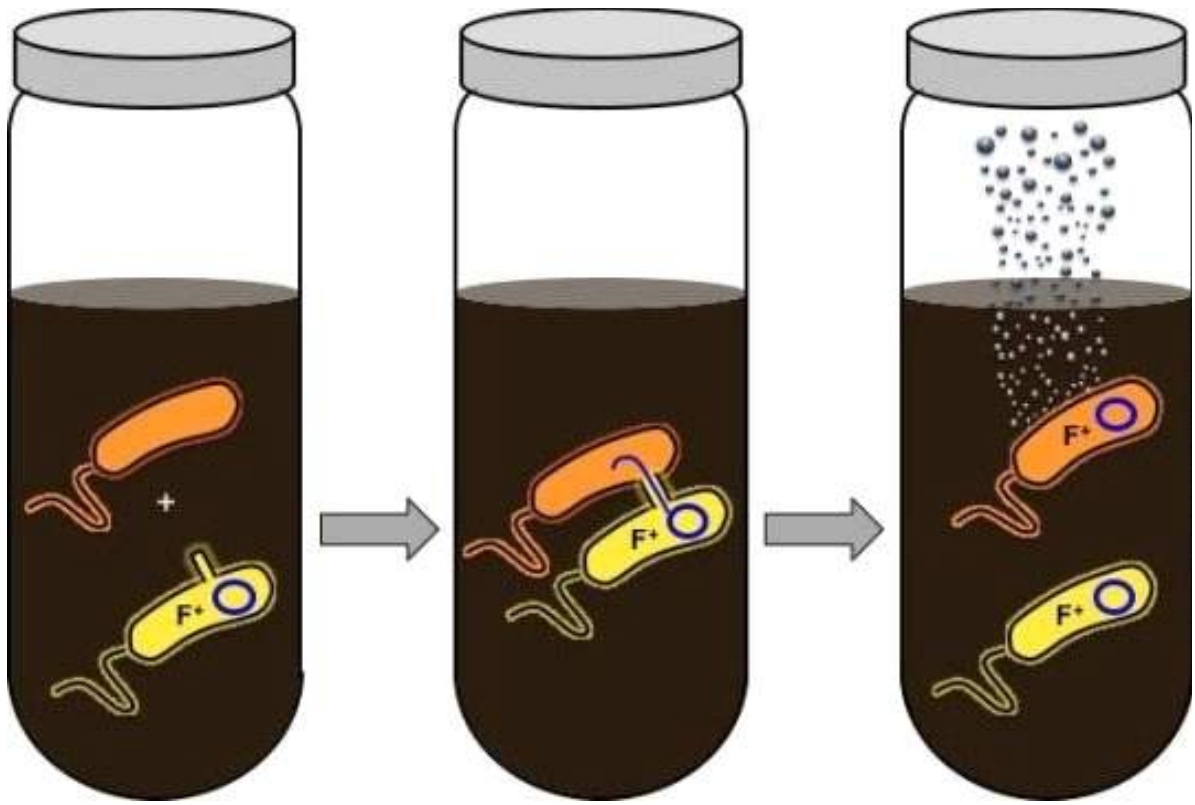

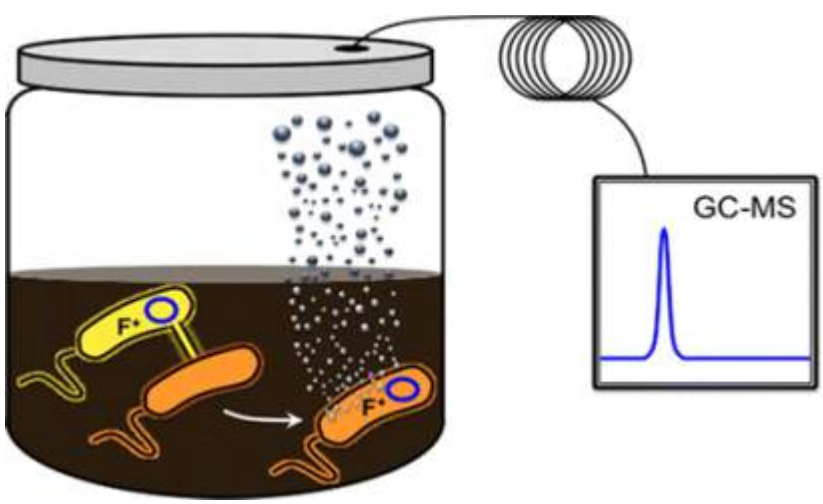

Rice University scientists have created programmed bacteria that serve as gas sensors to help them "see" into soil and learn about the behavior of the microbial communities within. When the engineered bacterium receives genetic information from another bacterium, it releases a gas to "report" the transaction. This New technique could aid agriculture, wastewater and green house gas studies.

In a study in the American Chemical Society's journal Environmental Science and Technology, the Rice team described using genetically engineered bacteria that release methyl halide gases to monitor microbial gene expression in soil samples in the lab.

The Rice lab tested soil samples from the National Science Foundation's Kellogg Biological Station Long Term Ecological Research Site in Michigan after adding Escherichia coli bacteria programmed to release gas upon transfer of their DNA to another microbe. Signals from the gas were up to 10,000 times the lab's detection limit.

The gas sensors were effective in anoxic or oxygen depleted conditions, unlike green fluorescent protein, which requires oxygen to work. It is anticipated the reporter proteins can be used in many kinds of soil microbes, and some are currently being tested. Traditional visual reporters of gene expression have only very limited use in soils because their outputs are challenging to detect through the soil matrix. This severely restricts our ability to study time dependent microbial gene expression in one of the Earth’s largest, most complex habitats. The is approach able to report dynamic gene expression within a microbial population in a soil under natural water levels (at and below water holding capacity) via production of methyl halides using a methyl halide transferase. As a proof of concept application, scientist couple the expression of this gas reporter to the conjugative transfer of a bacterial plasmid in a soil matrix and show that gas released from the matrix displays a strong correlation with the number of trans-conjugant bacteria that formed. Gas reporting of gene expression will make possible dynamic studies of natural and engineered microbes within many hard to image environmental matrices (soils, sediments, sludge, and biomass) at sample scales exceeding those used for traditional visual reporting.

The bacteria are programmed using synthetic biology to release gas to report when they exchange DNA through horizontal gene transfer, the process by which organisms share genetic traits without a parent to child relationship. The biosensors allow researchers to monitor such processes in real time without having to actually see into or disturb a lab soil sample.

The researchers expect scientists will use gas biosensors in the lab to study nitrogen fixing in agriculture, antibiotic exchange in wastewater treatment, gene transfer in conditions where nutrients are scarce and the relationship between gene expression in soil and the release of greenhouse gases. This technique is also helpful for environmental scientists where fluorescent reporter proteins serve for biochemists to track protein expression and other processes in biological systems. The researchers emphasized that these are tools for soil studies within lab environments. The synthetic microbes are destroyed once the results are obtained. This idea of using gases opens up most anything that's genetically encoded. Releasing and sensing methyl halide gas represented an easy proof of concept. Furthermore study required to obtain higher resolution information about other types of biological events by creating more sophisticated genetic programs using synthetic biology.

Researchers expecting they will soon be able to test agricultural soil samples to help fine tune crop growth through more efficient watering and fertilizer use. How can agriculture get this extra level of efficiency without the waste? Lots of people are coming to that, and there are lots of ways to do it, Researchers now trying to build high tech tools that allow us to understand mechanisms to make reliable predictions. That's the long game with these tools."

Care for your Heart!!!

Surbhi Sinha Agrawal, Corp. Comm. Department

If you're like many people, you may think of heart disease as a problem that happens to other folks. "I feel fine," you may think, "so I have nothing to worry about." If you're a woman, you may also believe that being female protects you from heart disease. If you're a man, you may think you're not old enough to have a serious heart condition.

These facts may seem frightening, but they need not be. The good news is that you have a lot of power to protect and improve your heart health.

What can you do to reduce your personal risk of heart disease?
First, you can learn about your own risk factors. Second, you can begin to make healthful changes in your diet, physical activity and other daily habits. Whatever your age or current state of health, it's never too late to take steps to protect your heart. It's also never too early. The sooner you act, the better.

Start taking action to improve your heart health today.

Rating Your Risk

Here is a quick quiz to find out if you have an increased risk for a heart attack. If you don't know some of the answers, ask your health care provider.

- [ ] **Do you smoke?**
- [ ] **Is your blood pressure 140/90 mmHg or higher; OR, have you been told by your doctor that your blood pressure is too high?**
- [ ] **Has your doctor told you that your LDL "bad" cholesterol is too high; that your total cholesterol level is 200 mg/dL or higher; OR, that your HDL "good" cholesterol is less than 40 mg/dL?**
- [ ] **Has your father or brother had a heart attack before age 55; OR, has your mother or sister had one before age 65?**
- [ ] **Do you have diabetes OR a fasting blood sugar of 126 mg/dL or higher; OR, do you need medicine to control your blood sugar?**
- [ ] **For women: Are you over 55 years old?**
- [ ] **For men: Are you over 45 years old?**
- [ ] **Do you have a Body Mass Index score of 25 or more?**
- [ ] **Do you get less than a total of 30 minutes of physical activity on most days?**
- [ ] **Has a doctor told you that you have angina (chest pains); OR, have you had a heart attack?**

If you answered "yes" to any of these questions, you have a higher risk of having a heart attack. Read on to learn what you can do to lower your risk.

HEART ATTACK SYMPTOMS

- Discomfort, pressure, heaviness, or pain in the chest, arm, or below the breastbone
- Discomfort radiating to the back, jaw, throat, or arm
- Fullness, indigestion, or choking feeling (may feel like heartburn)
- Sweating, nausea, vomiting, or dizziness
- Extreme weakness, anxiety, or shortness of breath
- Rapid or irregular heartbeats

During a heart attack, symptoms last 30 minutes or longer and are not relieved by rest or nitroglycerin under the tongue.

Some people have a heart attack without having any symptoms (a "silent" myocardial infarction). A silent MI can occur in anyone, but it is more common among people with diabetes.

HOW IS A HEART ATTACK DIAGNOSED?

To diagnose a heart attack, an emergency care team will ask you about your symptoms and begin to evaluate you. The diagnosis of the heart attack is based on your symptoms and test results. The goal of treatment is to treat you quickly and limit heart muscle damage.

TESTS TO DIAGNOSE A HEART ATTACK

- ECG
- Blood tests
- Echocardiography
- Cardiac catheterization

HEART-HEALTHY DIET AND EXERCISE

Your doctor says you need to make some changes in your life, especially with your diet and exercise. Perhaps you're wondering: Will it really make a difference? Do you really need to make those changes if you're taking medicine for your heart?

The answer is yes. Your lifestyle does matter - a lot.

- **Try DASH or TLC**

  Your doctor, or a dietitian, should have given you guidelines for your diet. They may have mentioned DASH (Dietary Approaches to Stop Hypertension), which is about lowering blood pressure, or TLC (Therapeutic Lifestyle Changes), which focuses on lowering your cholesterol levels.

  On either plan, you'll:
  - Eat more fruits, vegetables, whole-grain foods, poultry, fish, and low-fat dairy products
  - Eat less total fat, saturated fat, trans fat, and cholesterol
  - Limit the amount of red meat, sweets, and sweetened beverages you eat

- **Another cornerstone is cutting back on salt**

  Lowering the amount of salt you eat can help lower the amount of fluid your body holds onto. This lowers your blood pressure and makes it easier for your heart to do its work. Getting no more than 1,500 milligrams per day (about a quarter-teaspoon of table salt) helps the most.

  Try these tips:
  - Read labels. Look for “salt," "sodium," "sea salt," and "kosher salt.”

- Rinse salty canned food such as tuna before using it
- Substitute herbs and spices for sodium and salt when cooking
- Avoid instant or flavored side dishes, which usually have a lot of added sodium. Instead, try cooking plain rice, pasta, or grains without adding salt. You can add other flavorings or a bit of salt when you serve them.
- Look for "low sodium" on food labels

Exercise for a Healthy Heart

If you have heart disease, becoming more active is one of the best things you can do for yourself. It helps with your blood pressure and weight, and it makes your heart stronger.

Getting even as little as 30 minutes of moderate exercise on most days helps. You can do anything that makes your heart beat a little faster, whether it's walking, water aerobics, washing your car, or something else.

Before you start, check with your doctor to see if there are activities that aren't appropriate for you. Then choose activities that you enjoy and that you can work into your day. You don't have to do the same thing every day. You might find it easier to stay motivated if you involve friends or family members in your activities.

A CHANGE OF HEART

Taking care of your heart is one of the most important things you can do for your health and well-being. But, because heart health involves changing daily habits, it can require some real effort. To make the process easier, try tackling only one habit at a time. For example, if you smoke cigarettes and also eat a diet high in saturated fats, work first on kicking the smoking habit. Then, once you've become comfortable as a nonsmoker, begin to skim the fat from your diet.

Remember, nobody's perfect. Nobody always eats the ideal diet or gets just the right amount of physical activity. The important thing is to follow a sensible, realistic plan that will gradually lessen your chances of developing heart disease.

So keep at it. Work with your doctor. Ask family members and friends for support. If you slip, try again. Be good to your heart and it will reward you many times over-with a better chance for a longer, more vigorous life.

The Ship of Friendship

A voyaging ship was wrecked during a storm at sea and only two of the men on it were able to swim to a small, desert like island.

The two survivors who have been a good friends, not knowing what else to do, agreed that they had no other recourse but to pray to God. However, to find out whose prayer was more powerful, they agreed to divide the territory between them and stay on opposite sides of the island.

The first thing they prayed for was food. The next morning, the first man saw a fruit-bearing tree on his side of the land, and he was able to eat its fruit. The other man's parcel of land remained barren.

After a week, the first man was lonely and he decided to pray for a wife. The next day, another ship was wrecked, and the only survivor was a woman who swam to his side of the land. On the other side of the island, there was nothing.

Soon the first man prayed for a house, clothes, more food. The next day, like magic, all of these were given to him. However, the second man still had nothing.

Finally, the first man prayed for a ship, so that he and his wife could leave the island. In the morning, he found a ship docked at his side of the island. The first man boarded the ship with his wife and decided to leave the second man on the island.

He considered the other man unworthy to receive God's blessings, since none of his prayers had been answered.

As the ship was about to leave, the first man heard a voice from heaven booming, "Why are you leaving your companion on the island?"

"My blessings are mine alone, since I was the one who prayed for them," the first man answered. "His prayers were all unanswered and so he does not deserve anything."

"You are mistaken!" the voice rebuked him. "He had only one prayer, which I answered. If not for that, you would not have received any of my blessings."

"Tell me," the first man asked the voice, "What did he pray for that I should owe him anything?"

"He prayed that all your prayers be answered "

Moral:

For all we know, our blessings are not the fruits of our prayers alone, but those of another praying for us (Congregational Prayer). Value your friends, don't leave your loved ones behind.

VSI Conference, Pune







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