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The Science of Sugars

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Monitoring Food

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Enzyme - Assisted Extraction of Bio-ingredients





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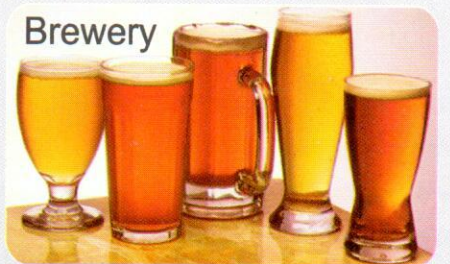
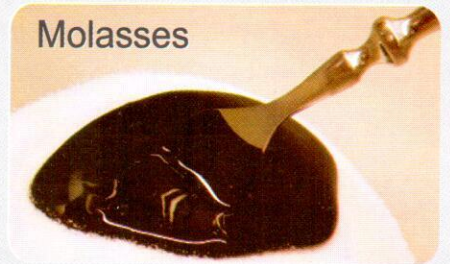
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Sugar mills sitting on huge inventory of 8.5 mn tonnes: ISMA

Sugar mills have begun the 2013-14 marketing year, that started this month, with an opening stock of 8.5 million tonnes and this huge inventory could spell trouble for the sector, according to industry body ISMA.

In 2012-13 marketing year (October-September), mills had an opening stock of 6.2 million tonnes, sufficient to meet three months' demand.

"We have the opening stock of sugar of about 8.5 million tonnes, higher than last year. The production estimate for 2013-14 is also more than the demand," Indian Sugar Mills Association (ISMA) Director General Abinash Verma said.



"It will be a difficult situation for the industry unless there is support from the state, central governments and rationalisation of sugarcane pricing," he added.

Ex-factory prices of sugar are currently lower than the last year's level, he said, adding that banks are reluctant to give loans to Uttar Pradesh-based mills unless there is linkage between cane and sugar prices.

Verma feared that sugarcane arrears to farmers will increase substantially from the current outstanding of about Rs 3,000 crore in the absence of government support. Maximum arrears pertain to Uttar Pradesh, the second biggest sugar producing state in the country.

ISMA has pegged sugar production in 2013-14 at 25 million tonnes as against the annual demand of 23.5 million tonnes. With likely surplus production this year, mills will have to focus

on exports, said Verma.

Asked about crushing operation, Verma said mills in Uttar Pradesh will start after the announcement of state advisory price (SAP) for this year.

In Maharashtra, the country's largest sugar producing state, mills are expected to begin crushing operations by the end of this month.

The Centre has fixed a fair and remunerative price of sugarcane at Rs 210 per quintal for 2013-14 marketing year.

Last year, the country produced



25.1 million tonnes of sugar and imported 0.75 million tonnes, taking the total availability of sweetener to 25.85 million tonnes. The demand was about 23 million tonnes and exports were 0.35 million tonnes.

The Science of Sugars



Punya Singla
(Jr. Manager - BD International)

Think about foods you most enjoy eating. Chances are they contain some form of sugar. It could be the sugar contributing to the prized taste of your favourite chocolate or the fresh taste of a juicy orange.

Indeed, most people enjoy the sweet taste of sugars. Scientists generally agree that you can enjoy sugar in moderation. This following information answers questions you may have about sugar and its role in a healthful diet.

What is sugar?

Sugar is a carbohydrate, which serves as the main energy source for the body. *There are many types of sugars.* They occur both naturally and as ingredients in many foods. The most familiar sugar is sucrose which is found not only in table sugar but also in fruits and vegetables.



There are many myths about the role of sugar in health. In order to address these myths, the International Food Information Council (IFIC) released a scientific review entitled "The Science of Sugars".

The IFIC Foundation is dedicated to the mission of effectively communicating science-based information on health, nutrition and food safety for the public good.

In their review, IFIC

looked at all the scientific information relating to sugar and health and made the following conclusions:

- **Sugar and Diabetes:**

Sugar does not cause diabetes. Diabetes occurs when there is a disruption in the body's ability to convert blood glucose (commonly referred to as blood sugar) into energy. Genetics and an unhealthy lifestyle such as poor physical activity and obesity contribute to developing diabetes. In fact people who have diabetes are allowed to have sugar in their diet.

- **Sugar and Weight Gain:**

Weight gain and obesity occur when we eat more calories than

Why is sugar added to foods?

Sugar plays an important role in food. It adds taste, texture and colour to baked goods and provides energy for yeast used in baking bread. It adds body to yogurt and helps balance acidity in tomato sauces and salad dressings. Sugar helps to preserve jams, cereals, cakes, candies, cookies and drinks. Tender, moist cakes and the golden-brown, crispy essence of biscuits are due to the presence of sugar in food.

Is sugar safe to eat?

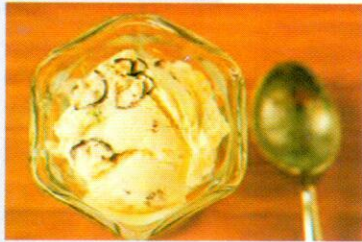
our body can use. The excess calories are stored as fat.

As sugar is an ingredient to many favourite foods such as ice-cream and chocolate, it is natural to suspect that sugar causes weight gain. However, many scientific studies have found that higher intakes of sugar are associated with a lower incidence of obesity.

Sugar and Tooth Decay:

Many people associate sugar with dental caries, however, all carbohydrates can contribute to the formation of cavities. Bacteria in the mouth break down carbohydrates which form acids that can leach minerals from tooth enamel.

Sticky snacks like raisins and other dried fruits, and starchy foods like breadsticks, cereals and potato chips, linger on teeth and prolong acid production even more than most sweets. However, sugar and other carbohydrates are not the most important factor in the cause of tooth decay.



Several studies have shown that where proper oral hygiene is followed and adequate fluoride exposure exists, caries prevalence has decreased despite increases in sugar consumption. Furthermore, if carbohydrate-containing foods are eaten frequently but oral hygiene is maintained and fluoride used, caries are not likely to form.

Therefore, prevention should focus on proper oral hygiene and adequate fluoride use (such as in fluoride toothpaste), rather than fermentable carbohydrates alone.

Experts agree that carbohydrates and sugars in foods and beverages can be enjoyed in moderation as part of a balanced diet and active lifestyle.

10 Natural Alternatives of Sugar

Try some of these natural alternatives to maintain healthy taste of sugar in life:

1. Stevia - A herb native to South American, stevia is 300 times sweeter than sugar. It has been used as a sweetener.

2. Xylitol - This subtle difference means it helps prevent the growth of bacteria. It is found naturally in fibrous fruits and vegetables, corn cobs, and some hardwood trees - even our own bodies produce it.

3. Coconut Sugar - Coconut sugar is nutritious and has a low score on the glycemic index, which means you don't get a buzz followed by a crash. It tastes similar to brown sugar but is slightly richer.

4. Date Sugar - Made from, as the name would suggest, dried dates; the fruit is dehydrated, then ground to produce the sugar. Retaining many of the nutritional benefits of dates, it has a rich sweet flavour that makes it an ideal alternative to brown sugar.

5. Honey - Sweeter than sugar, get honey that's been organically and locally produced to reap the full benefits. Packed with vitamins, honey also has antimicrobial properties. It does have more calories than normal sugar but because it's sweeter you use less of it.

6. Maple Syrup - is made from dehydrated maple syrup. Like coconut sugar, it can replace regular sugar as and when you need it.

7. Fruit juice - Fruit is a great source of natural sugar, and comes in a range of strengths and flavours. Juices are great for adding sweetness to cakes and cookies.

8. Molasses - These are by-products of the sugar production process, having many of the nutritional benefits. Blackstrap molasses is perhaps the most beneficial and is a good source of iron and calcium.

9. Brown Rice Syrup - Made from boiling brown rice, the syrup is gluten and wheat free. More suitable for cooking than adding to tea, it can also be used as a condiment and drizzled over pancakes or porridge.

10. Barley Malt Syrup - Similar to molasses in texture, barley malt syrup has, unsurprisingly, a malty taste. It's also easily digested and has a low glycemic index.

Monitoring Food

The FSSAI is the regulatory body that deals with matters relating to food safety and hygiene in the country

The food that we eat is a source of nourishment & nutrition. but it can also be a source of illness & diseases. The difference between food as fuel of life and food as a source of ill health depends upon the quality and the purity of the food consumed. This is where the **Food Safety and Standards Authority of India (FSSAI)** performs its vital function.

It has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.

FSSAI has been established under Food Safety and Standards Act, 2006 which consolidates various acts & orders that have hitherto handled food related issues in various Ministries and Departments. Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI.

The bill was passed by Lok Sabha on 25th July 2006 and by Rajya Sabha on 2nd August 2006.

Various central Acts will be repealed after commencement of FSS Act, 2006. like -

- Prevention of Food Adulteration Act, 1954,
- Fruit Products Order, 1955,
- Meat Food Products Order, 1973,
- Vegetable Oil Products (Control) Order, 1947,



Vinay Kr. Khare
(Dy. Manager - QA/QC)

- Edible Oils Packaging (Regulation) Order 1988,
- Solvent Extracted Oil, De- Oiled Meal and Edible Flour (Control) Order, 1967,
- Milk and Milk Products Order, 1992

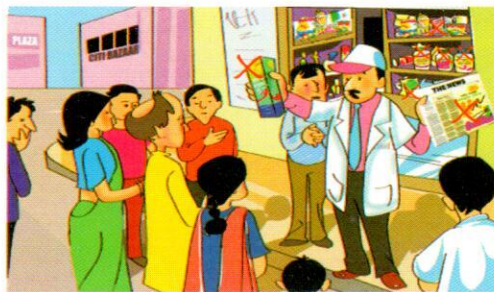
The Act also aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi-level, multi- departmental control to a single line of command.

To this effect, the Act establishes an independent statutory Authority – the Food Safety and Standards Authority of India with head office at Delhi. Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities shall enforce various provisions of the Act.

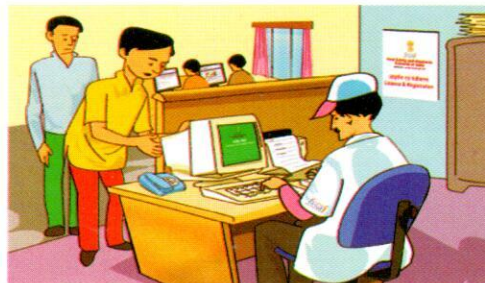
FSSAI has been mandated by the FSS Act, 2006 for performing the following functions:

- Framing of Regulations to lay down the Standards and guidelines in relation to articles of food and specifying appropriate system of enforcing various standards thus notified.

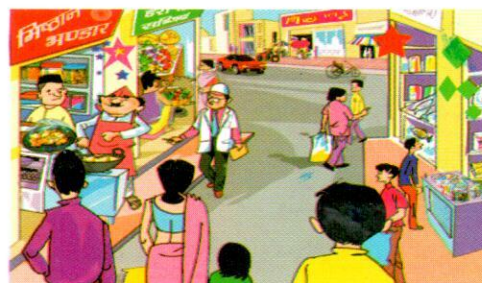
- Laying down mechanisms and guidelines for accreditation of certification bodies engaged in certification of food safety management system for food businesses.



Enlightening people about misleading / misbranding Information



Simplifying procedures for Registration & Licensing



Awareness for Safe Food Consumption

- Laying down procedure and guidelines for accreditation of laboratories and notification of the accredited laboratories.

- To provide scientific advice and technical support to Central Government and State Governments in the matters of framing the policy and rules in areas which have a direct or indirect bearing of food safety and nutrition .

- Collect and collate data regarding food consumption, incidence and prevalence of biological risk, contaminants in food, residues of various, contaminants in foods products, identification of emerging risks and introduction of rapid alert system.

- Creating an information network across the country so that the public, consumers, Panchayats etc receive rapid, reliable and objective information about food safety and issues of concern.

- Provide training programmes for persons who are involved or intend to get involved in food businesses.

- Contribute to the development of international technical standards for food, sanitary and phyto-sanitary standards.

- Promote general awareness about food safety and food standards.

The Food Safety and Standards Regulations, 2011

The Food Safety and Standards Regulations, 2011 has been notified in the Gazette of India dated 1st Aug 2011. These Regulations shall come in force on or after 5th Aug 2011

- Food safety and Standards (Licensing and Registration of

Food businesses) regulation, 2011

- Food Safety and standards (Packaging and Labelling) regulation, 2011

- Food safety and standards (Food product standards and Food Additives) regulation, 2011 (part I)

- Food safety and standards(Food product standards and food additives) regulation, 2011 (part II)

- Food safety and standards (Prohibition and Restriction on sales) regulation, 2011

- Food safety and standards (contaminants, toxins and residues) regulation, 2011

- Food Safety and Standards (Laboratory and sampling analysis) regulation, 2011



General Sanitary Parameters

1. All food service premises shall be located in a sanitary place, clean, adequately lighted and ventilated and maintain overall hygiene.

2. Windows, doors and other openings shall be fitted with net or screen.

3. The water used in the manufacturing shall be potable.

4. Equipment and machinery that permit easy cleaning shall be chosen.

5. All equipments shall be kept clean, washed, dried and stacked at the end of business.

6. Premises to have efficient drainage system and adequate provisions for disposal of refuse.
7. The workers should use clean aprons, hand gloves, and head wears.
8. Persons suffering from infectious diseases shall not be permitted to work. Any cuts or wounds shall remain covered at all time and the person should not be allowed to come in direct contact with food.
9. All food handlers shall keep their finger nails trimmed, clean and wash their hands with soap, or detergent and water before commencing work and every time after using toilet. Scratching of body parts, hair shall be avoided during food handling processes.
10. Eating, chewing, smoking, spitting and nose blowing shall be prohibited especially while handling food.
11. All food stuffs to be covered to avoid contamination.

Consumer Rights & Rewards

As a consumer you have certain rights with regards to the food and food products you purchase. You also have a redressal mechanism to help you. All you have to do is to be aware and exercise your rights.

Know Your Rights

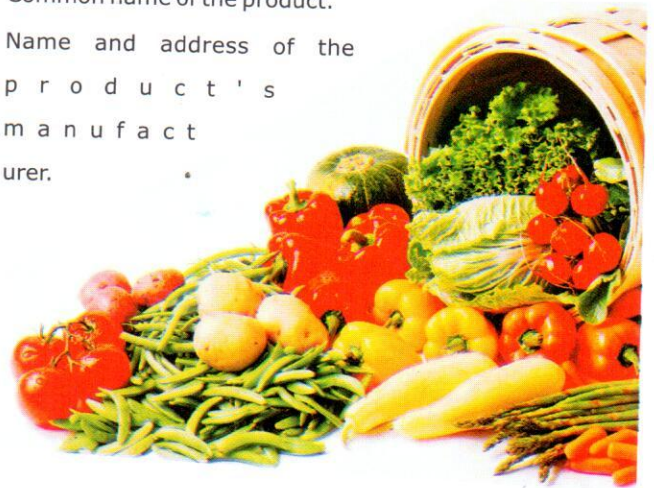
- 1 A Purchaser of food article may, if he so desires, can have the article analysed by the Food Analyst as per the provisions of the act.
- 2 The Purchaser shall pay the prescribed fee to the Food Analyst for carrying out the analysis which will be refunded if the food samples found substandard.
- 3 The Food Analyst shall send to the Purchaser his report on analysis of the article of food and if the finding of the report is to the effect that the article of food is

adulterated/misbranded/contaminated or does not conform to the standards prescribed under the Act or the Regulations. The Purchaser shall be entitled to get a refund of the fees paid by him.

Labelling

It is mandatory that every package of food intended for sale should carry a label that bears all the information required under FSS (Packaging and Labelling) Regulation, 2011. Food package must carry a label with the following information:

- Common name of the product.
- Name and address of the product's manufacturer.
- Date of Manufacturing
- Ingredient list with Additives & Nutrition Facts
- Best before/ Expires on
- Net contents in terms of weight, measure or count.
- Packing codes/Batch number
- Declaration regarding vegetarian or non-vegetarian
- Country of origin for imported food



Consumer Rewards Scheme

FSSAI has a reward scheme for people who convey valid information about mislabelling, misbranding and extravagant claims. Your Identity will be kept absolute secret. A reward of Rs. 500/- will be given once FSSAI establishes the validity of the complaint. You can send the information to ceo@fssai.gov.in

Enzyme - Assisted Extraction of Bioingredients

In the modern world, bio-ingredients have an important role to play in different spheres of human life. They can be a major component of food we eat; beverages that quench our thirst; medicines that cure our illness; cosmetics that make us beautiful and clothes that makes us fashionable. So the demand for bio-ingredients is increasing day by day.

Modern science and technology is being challenged by the rising demand from society for development of new bio-ingredients, sources and method of isolation.

Bio-ingredients are the active principles for plants and are generated in the plants either by the primary or secondary metabolic reaction taking place during the course of plant growth. The primary metabolites of plants are mainly lipids, proteins and carbohydrates. The secondary metabolites are : phenolics, terpenoids and alkaloids.



As a consequence of the increased demand for bio-ingredients like essential oil, natural colors, pure components from the industries, there is a need for extensive collection for information on the composition of bio-ingredients and their recovery methods.

The extraction of bio-ingredients from plant material can be achieved by a number of different methods, like:

- **EXPRESSION**
- **DISTILLATION (Hydra- or water distillation, water & steam distillation , steam distillation)**
- **SOLVENT EXTRACTION**
- **SUPER CRITICAL FLUID EXTRACTION (SCFE) and**



Kapil Khandelwal
(Sr. Manager - BD)

● ENZYME ASSISTED EXTRACTION

For each method there may be many variations and refinements and the extraction may be conducted under pressure (vacuum), ambient pressure or excess pressure. The choice of extraction method will depend on the nature of the material, the stability of the chemical components and the specification of the targeted product.

EXPRESSION : It is used exclusively for the extraction of citrus oil from the fruit peel, because the chemical components of the oil are easily damaged by heat. Citrus oil production is now a major by-product process of the juice industry.

DISTILLATION: It is a physical process used in the most of the industries to isolate the volatile portions of plant materials.

The main advantage of distillation is that it can generally be carried out with some very simple equipment, close to the location of plant production. Even in relatively remote locations large quantities of material can be processed in a relatively short time. There are various types of distillation methods like hydrazine distillation, water and steam distillation and steam distillation. The selection of the distillation depends on the nature of the plants and their parts.

SOLVENT EXTRACTION : Many herbs and spices cannot be extracted by distillation method. In such cases, solvent extraction is the safest method for extraction high quality oil. In this process, the spices or herbs are immersed in the solvent and the 'separation' is performed chemically. These include pigments, volatile molecules and non-aromatic waxes. A solvent is a liquid or gas that dissolves a solid, liquid, or

gaseous solute, resulting in a solution. Solvents usually have a low boiling point and evaporate easily, or can be removed by distillation, leaving the dissolved substance behind.

Basically there are two categories of solvent, i.e. Organic & Inorganic solvent. The selection of the an appropriate solvent is guided by theory and experience.

Generally, a good solvent should meet the following criteria:

1. It should be inert to the reaction conditions
2. It should dissolve the reactants, reagents and bio actives
3. It should have an appropriate boiling point and
4. It should be easily removed at the end of the reaction

Spice oleoresins are prepared by this method.

SUPER CRITICAL FLUID EXTRACTION

(SCFE): Solvent is not considered as the best method for extraction as the solvents can leave a small amount of residue behind

which could cause allergies and affect the immune system.

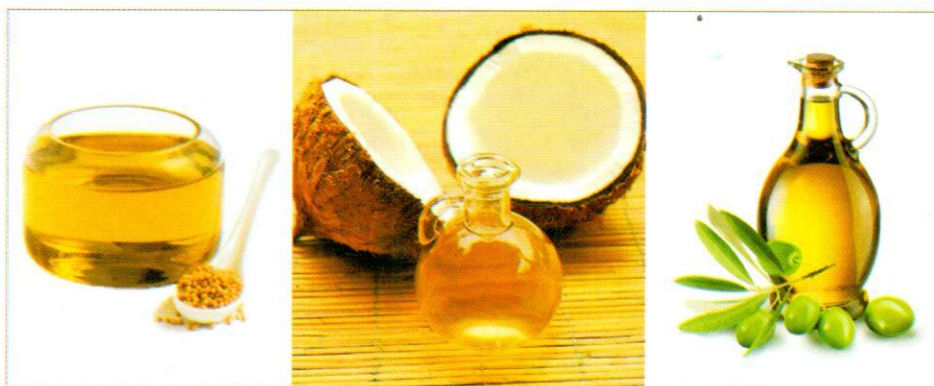
The most recent method is that of the distinguished carbon dioxide extraction. This method uses carbon dioxide to extract the essential oil and oleresins from the plant when liquified under pressure. Once the liquid depressurizes, the carbon dioxide returns to a gaseous state, and only pure essential oil and resin remains.

SCFE has many advantages over other methods of extraction like the absence of solvent residue, no off odours, low mono-terpenes hydrocarbon levels, more tio notes and more back notes giving a full but different profile than with traditional extraction methods.

ENZYME ASSISTED EXTRACTION: Modern science and technology have helped flavour industries, food industries, cosmetic and other non food industries to improve product qualities by providing advanced equipments & ingredients. To cop up with the emerging requirements, advanced extraction technologies are required. Enzyme assisted extraction is the recent approach for extracting bio-ingredients from plant materials.

The application of enzymes in the extraction of essential oils from oilseeds like - sunflower, soybean, rapeseed, corn, coconut, olives, avocado, ans also for the extraction of rice bran oil etc. are well documented.

Enzymes are proteins with highly specialised catalytic functions and produced by all living organisms. The are responsible for many essential biochemical reactions in



microorganisms, plants, animals and human beings. Enzymes are essential for all metabolic processes. Although like all other proteins, enzymes are composed of

amino acids, they differ in functions in that they have the unique ability to facilitate biochemical reactions without undergoing change themselves. This catalytic capability is what makes enzymes unique. In other words, they are highly specific biological catalysts. Enzymes not only work efficiently and rapidly, they are also biodegradable. Enzymes are highly efficient in increasing the reaction rate of biochemical processes that otherwise proceed very slowly, or in some cases, not at all.

Enzymes are categorized according to the compound they act upon . Some of the most common types include proteases (which break down proteins), cellulase (which split fats into glycerol and fatty acids), and amylase (which break down

starch into simple sugars).

Enzymes are classified into the following types:

1. Hydrolysing enzymes
2. Oxidation-reduction enzymes
3. Ligases
4. Group transfer enzymes
5. Demolases
6. Isomerizing enzymes
7. carboxylation enzymes.

Based on their property of catalyzing definite reactions, a particular enzyme acts on a specific substance.

The enzymes also do not become part of the final product of the biochemical reaction that they are catalyzing.

When the biochemical reaction is over, the product of the reaction leaves the enzyme. The enzyme is then ready to effect the same reaction on another molecule again and again. Given the right condition to function, the enzyme can go on and on for as long as needed.

CONCLUSION

In addition to the aforementioned plants materials a number of other plants like vanilla, pepper, mace, mustard, denugreek, rose and citrus peel, which are potential source of bio-ingredients have been studied for enzyme assisted extraction of spice oils and oleoresins. Similarly, enzyme assisted extraction of colour has been studied in plant materials like marigold, safflower, grapes, paprika, tomato, alfalfa and cherries.

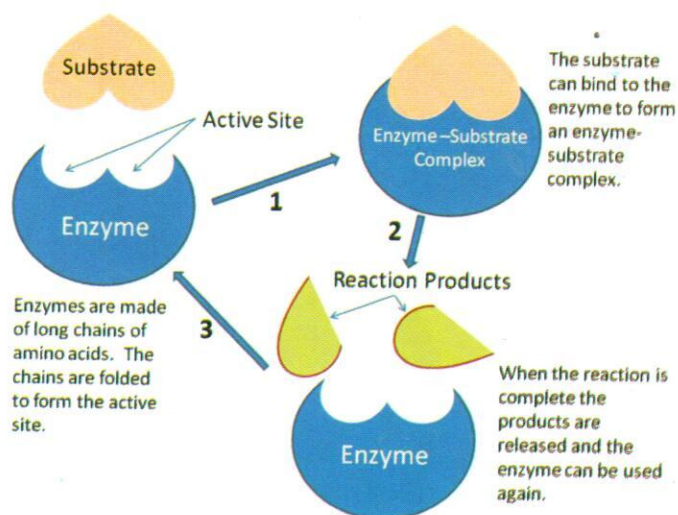
Efforts were made to develop new technologies with enzyme pretreatment that could provide a thorough extraction of

flavoring principles from vegetables.

Application of enzymes for bio-ingredients extraction from plant materials is a new area, requires more intense research inputs to establish itself as a promising technique.

Application of enzymes for complete extraction of bio-ingredients without the use of solvent could be an attractive proposal. Enzymes in solvents could be tried for enhanced extraction of value added cell constituents from spices.

The key advantages of enzyme pretreatment include the reduction of extraction time, minimal usage of solvents and a product with increased yield and quality.



A limitation of this method could be cost of the enzymes. This could be overcome by balancing the concentration of enzyme preparations and tailor made enzyme preparations for specific reaction

Enzymes have been used safely in a wide variety of foods for centuries. the bio diversity of enzymes is providing the food industry with a wide range of functionalities.

- (Sources : - 1. Research Paper from Dr. T. V. Ranganathan, Professor, Food Processing and Engineering Karunya University, Coimbatore.
2. Research paper from K.C. Baby, Bio-ingredients Division, Synthite Industries Ltd.
 3. Chemical weekly, October edition.)

Walking For Good Health

Walking can improve your health and fitness by helping you lose body fat, improve your fitness and avoid heart disease, type 2 diabetes, osteoporosis and some cancers. Try to walk briskly for at least 30 minutes most days of the week. Walking with others can turn exercising into an enjoyable social occasion.

Physical activity does not have to be vigorous or done for long periods in order to improve your health. A 2007 study of inactive women found that even a low level of exercise – around 75 minutes per week – improved their fitness levels significantly, when compared to a non-exercising group.

Walking is low impact, requires minimal equipment, can be done at any time of day and can be performed at your own pace. You can get out and walk without worrying about the risks associated with some more vigorous forms of exercise. It's also a great form of physical activity for people who are overweight, elderly or who haven't exercised in a long time.

Walking for fun and fitness isn't limited to strolling by yourself around local neighbourhood streets. There are various clubs, venues and strategies you can use to make walking an enjoyable and social part of your lifestyle.

Health benefits of walking

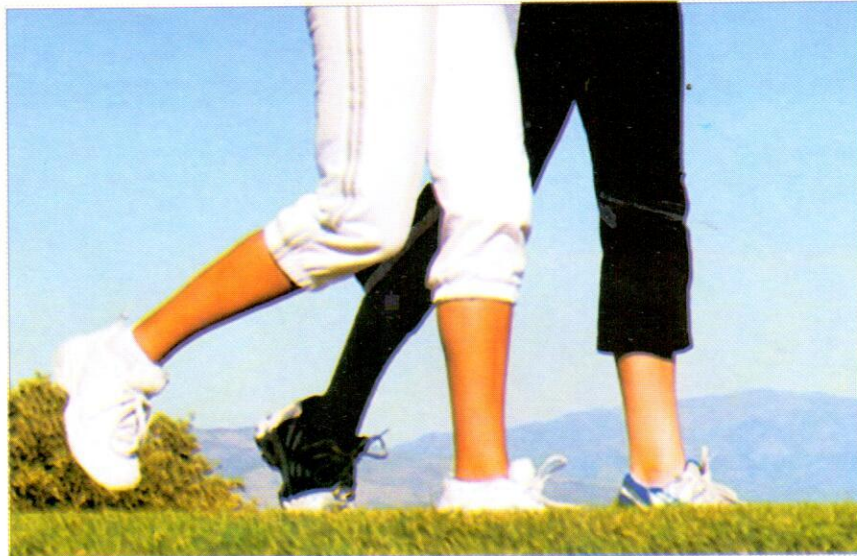
You carry your own body weight when you walk. This is known as weight-bearing exercise.



Ashwini Agrawal
(DGM - Business Development)

Some of the benefits include:

- Increased cardiovascular and pulmonary (heart and lung) fitness
- Reduced risk of heart disease and stroke
- Improved management of conditions such as hypertension (high blood pressure), high cholesterol, joint and muscular pain or stiffness, and diabetes
- Stronger bones and improved balance
- Increased muscle strength and endurance
- Reduced body fat.



Walking for 30 minutes a day

To get the health benefits, try to walk for at least 30 minutes as briskly as you can on most days of the week. 'Brisk' means that you can still talk but not sing, and you may be puffing slightly.

Moderate activities such as walking pose little health risk but, if you have a medical condition, check with your doctor before starting any new exercise program of physical activity.

For Your Heart : Heart-related diseases are closely related to the capacity of the heart to pump blood to meet your body's needs. You can strengthen your heart's capacity by walking. Brisk walking should make your heart beat faster. Walking equals other exercises in heart benefits, even jogging or running.

Walking at 75% - 85% of a maximum heart rate offers the

same health benefits as aerobic exercise while resulting in fewer injuries because of the lower force hitting the ground. Walking 3 miles an hour, or around 20 minutes per mile, should get your heart beating faster, improving blood flow and increasing health benefits.

For Diabetes :The World Diabetes Foundation recommends that people diagnosed with diabetes should avoid stress, exercise regularly, and reduce weight if overweight, which can all be helped by walking regularly.

Changing diet and increasing physical activity like walking can prevent 80% of type 2 diabetes diagnoses. In fact, a study of over 3,200 overweight adults found that a good diet and 2.5 hours of walking per week reduced the risk of developing diabetes by 58%. Diabetes can lead to increased risk of kidney failure, lower-extremity amputations, and blindness.

For Your Life : Walking is especially important in the prevention of chronic disease, which effects nearly 1 out of every 2 American adults.

Nearly all chronic diseases are related to obesity, which puts stress on muscles, heart, and bones. The United Nations World Health Organization and the US Center for Disease Control agree that chronic diseases can be prevented or delayed by being active and walking.

Walking also helps alleviate the symptoms of chronic disease. Combining just 20 minutes of vigorous exercise 3 days a week with a weekly walking routine can reduce the changes of mortality by 50%.

Building physical activity into your life

If it's too difficult to walk for 30 minutes at one time, do regular small bouts (10 minutes) three times per day and gradually build up to longer sessions. However, if your goal is to lose weight, you will need to do physical activity for longer than 30 minutes each day.

You can still achieve this by starting with smaller bouts of activity throughout the day and increasing these as your fitness improves. Physical activity built into a daily lifestyle plan is also one of the most effective ways to assist with weight loss and keep weight off once it's lost.

Some suggestions to build walking into your daily routine include:

1. Take the stairs instead of the lift (for at least part of the way).
2. Get off public transport one stop earlier and walk to work or home.
3. Do housework like vacuuming.
4. Walk (don't drive) to the local shops.
5. Walk the dog (or your neighbour's dog).

WALK
YOUR WAY TO BETTER HEALTH

Anatomy of Walking

- BOOSTS ENDORPHINS**
EASING STRESS, TENSION, ANGER, FATIGUE, AND CONFUSION IN TEN MINUTES
- REDUCES GLAUCOMA RISK**
- HALVES ALZHEIMER'S DISEASE RISK OVER 5 YEARS**
- LIMITS SICKNESS**
BY HALVING ODDS OF CATCHING A COLD
- IMPROVES HEART HEALTH**
BY INCREASING HEART RATE AND CIRCULATION
- WORKS ARM & SHOULDER MUSCLES**
- ENGAGES AB MUSCLES**
- IMPROVES BLOOD PRESSURE**
BY FIVE POINTS
- BUILDS BONE MASS,**
REDUCING RISK OF OSTEOPOROSIS
- LIMITS COLON CANCER**
BY 31% FOR WOMEN
- STRENGTHENS LEGS,**
INCLUDING QUADRICEPS, HIP FLEXORS, AND HAMSTRINGS
- IMPROVES BALANCE**
PREVENTING FALLS
- BURNS MORE FAT**
THAN JOGGING

ONLY 30 MINUTES A DAY, 5 TIMES A WEEK CAN MAKE YOU HEALTHIER AND HAPPIER.

Can Your Car Be Hacked?

You might be behind the wheel, but increasingly, computers control your car's every function.

Microprocessors direct braking, acceleration and even the horn these days. "Because they are hidden, people don't often understand that there can be anywhere from 30 to 40 microprocessors in most cars and even up to 100 different ones running different functions in some vehicles," says Stephan A. Tarnutzer, chief operating officer for DGE Inc., which provides electronic designs and consulting for auto manufacturers and suppliers.

But could a hacker compromise these systems? Recently, several news reports have raised the issue of car-hacking risks, including:

Vehicle disablement :

After a disgruntled former employee took over a Web-based vehicle-immobilization system at an Austin, Texas, car sales center, more than 100 drivers found their vehicles had been disabled or their horns were honking out of control.

Tire pressure system hacking : Researchers from the University of South Carolina and Rutgers University were able to hack into tire pressure monitoring systems. Using readily available equipment and free software, the researchers triggered warning lights and remotely tracked a vehicle through its unique monitoring system.

Disabling brakes : Researchers at the University of



Neeraj Soni
Executive (Accounts)

Washington and University of San Diego created a program that would hack into onboard computers to disable brakes and stop the engine. The researchers connected to onboard computers through ports for the cars' diagnostic system.

Is your car at risk?

The potential for car hacking is real, although there may not be a financial incentive for hackers to focus on autos just yet, say the experts. "All the malware attacks consumers are faced with

every day have financial motives behind them," says Ryan Smith, a principal researcher with Accuvant Labs who finds vulnerabilities in computer systems.

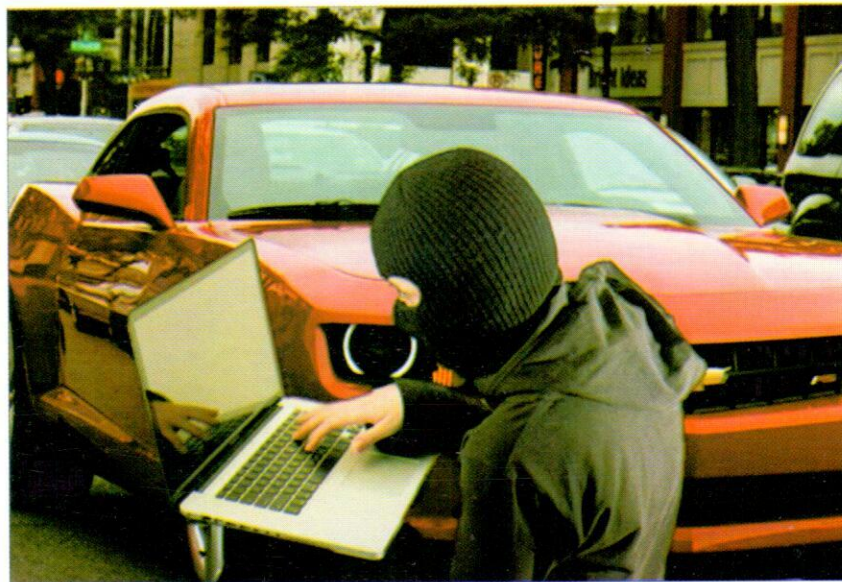
Most of the danger right now may come from hackers who want to demonstrate their prowess and enhance their reputations, says

Tarnutzer. And the increased reliance on wireless systems -- such as the tire pressure monitoring system -- makes your car more vulnerable to these attacks, says John Bambene, a security researcher with the Internet Storm Center, the global cooperative community that monitors cyberthreats.

Protect your car from hacking

Security is largely in the hands of auto manufacturers, who are working to address concerns. In the meantime, you can take these steps to protect your vehicle:

Ask about wireless systems : Familiarize yourself with the wireless systems if you're purchasing a new car, advises



Bambenek. For a car you already own, you can review your manual or check online. Find out if any of the systems can be operated remotely.

Ask about remote shutdown : If you're financing through the company from which you purchased the vehicle, ask about remote shutdown related to repossession. Make sure the seller has security measures in place that control access to the system.

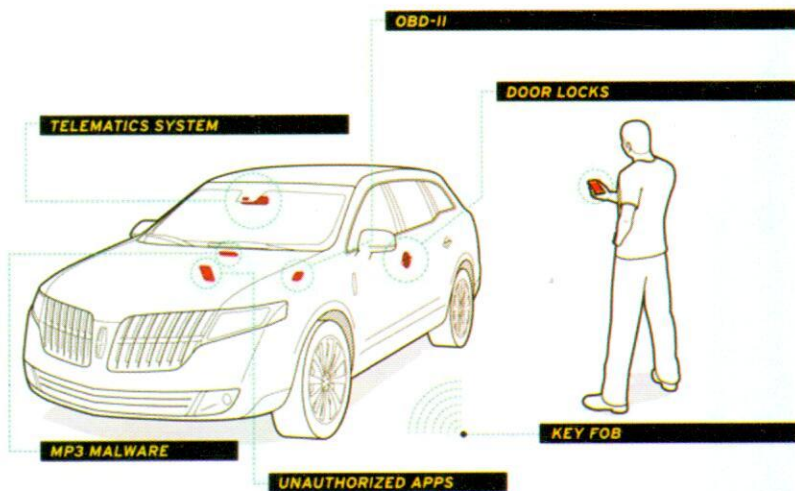
Go to reputable dealers and repair shops : It's possible for unscrupulous garages to manipulate your car's computer systems, making it appear you need repairs that aren't actually warranted. Don't cut corners when it comes to choosing a dealer or repair shop.

Protect your information : Of course, locking your car is always wise. And if you use OnStar -- the GM-owned auto security and information service -- make sure you don't leave On Star-related documents or your password in the car, says John Luludis, president and co-founder of Superior Tech Solutions, an IT provider, and a former car industry tech executive. Since On Star can remotely shut off your engine if you report the vehicle stolen, there's the potential for mischief if your password falls in the wrong hands.

Be cautious about after-market devices : After-market car systems may not be as rigorously tested or designed, opening you to vulnerabilities, says Tarnutzer.

Luludis compares the use of computers in cars to the development in our use of personal computers. Hacking exploded when the Internet evolved, making it easy to access computers via networks. Wireless connections mean your car is no longer a closed system. "Once you have connection to vehicles, you have an entry point for people to try to access," says Luludis. "The only thing standing in their way now is a standardized piece of software. It's a concern we need to address."

So the battle between the hackers and the carmakers is on.



Here are your car's most vulnerable entry points and what automakers are doing to protect them:

TELEMATICS SYSTEM

THE HACK: A car's telematics system, which can notify police in the event of a crash; remotely disable a stolen vehicle, and offer diagnostic information to customers, can also interface with multiple vehicle systems.

Therefore, after gaining access to the telematics system, it's possible to control the systems connected to the CAN bus. A hacker could, for example, disable a car's ignition the same way an anti-theft system would.

THE DEFENSE: To demonstrate this kind of hack, researchers had to master and reverse-engineer an entire telematics system. Still, forward-looking automakers are already beefing up the security of external communications and in-car networks. OnStar, for example, has a "white list" of approved computers that are allowed to connect with cars.

MP3 MALWARE

THE HACK: Naughty boy. You downloaded your Odd Future tunes from an unauthorized file-sharing service. Little did you know that version of Goblin contains code that battles its way to your car's CAN bus and disables your brakes.

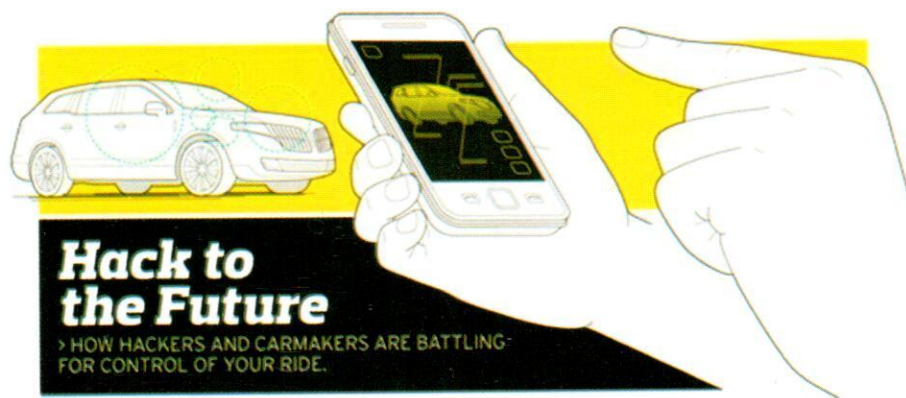
THE DEFENSE: As infotainment systems gain functionality, carmakers are shielding them from more vital components

without jeopardizing vehicle integration. "We harden all our safety-critical systems," says OnStar's security chief Gassenfeit. GM's newer cars, such as the 2011 Chevy Volt, verify any data sent between two systems the same way online retailers process credit cards.

UNAUTHORIZED APPS

THE HACK: Just as smartphone manufacturers have app stores in which thousands of programs developed by third-party companies are available for download, carmakers are expanding their infotainment offerings through downloadable software. If a rogue app contains malware or a virus, however, it can infect your car without your knowledge.

THE DEFENSE: Carmakers are very strict in selecting which apps make it onto their systems. Ford's MyFord Touch and Toyota's Entune allow only a handful of preapproved programs, while GM's MyLink goes so far as to route all software through remote servers so that users won't inadvertently install infected apps on their cars.



DOOR LOCKS

THE HACK: In most modern cars, the power-locking mechanism is connected to other vehicle systems so that doors can lock automatically when a car is put into drive and unlock if the airbags have been deployed or the keys are locked inside.

That interconnectivity, theoretically, means that the locking mechanism can be breached to access other systems. If accelerating can engage a car's power locks, a skilled hacker could use the power locks to force that car to accelerate.

THE DEFENSE: Infotainment and onboard diagnostic systems are still linked by a physical connection to the module that controls functions such as steering and braking, but on some systems, such as Ford's, that connection goes only one way. "The only thing we allow is for the real-time module to send messages in one direction," says Ford's Strader.

KEY FOB

THE HACK: It sounds like one of those warnings that shows up in chain e-mails every few months, except it's true. A wireless key fob is supposed to unlock and/or start the car only when the person holding the key-fob is directly next to the vehicle or already sitting inside.

However, Swiss researchers have found a way to intercept and extend the signal up to 30 feet with parts that cost less than \$100. The setup doesn't replicate the signal—it just extends its

range so the car thinks the key fob is closer than it actually is.

THE DEFENSE: There's not much a car manufacturer can do here.

These hackers haven't broken the key fobs' encryption in any way—they've just extended its range with a radio repeater. So keep an eye out for anyone loitering in a parking lot and holding a homemade antenna.

Communication Process

To Speak, Listen, Write, and Read Effectively

Communication skills are some of the most important skills that you need to succeed in the workplace. Whenever you communicate with someone else, you and the other person follow the steps of the communication process shown below.

Here, the person who is the source of the communication encodes it into a message, and transmits it through a channel. The receiver decodes the message, and, in one way or another, feeds back understanding or a lack of understanding to the source.

By understanding the steps in the process, you can become more aware of your role in it, recognize what you need to do to communicate effectively, anticipate problems before they happen, and improve your overall ability to communicate effectively.

The Source – Planning Your Message

Before you start communicating, take a moment to figure out what you want to say, and why. Don't waste your time conveying information that isn't necessary – and don't waste the listener or reader's time either. Too often, people just keep talking or keep writing – because they think that by saying more, they'll surely cover all the points. Often, however, all they do is confuse the people they're talking to.

To plan your communication :

- Understand your objective. Why are you communicating?
- Understand your audience. With whom are you communicating? What do they need to know?
- Plan what you want to say, and how you'll send the message.
- Seek feedback on how well your message was received.

When you do this, you'll be able to craft a message that will be received positively by your audience.



Chanchal Nim
(Jr. Manager - Corp. Comm.)

Good communicators use the KISS ("Keep It Simple and Straightforward") principle. They know that less is often more, and that good communication should be efficient as well as effective.

Encoding – Creating a Clear, Well-Crafted Message

When you know what you want to say, decide exactly how you'll say it. You're responsible for sending a message that's clear and concise. To achieve this, you need to consider not only what you'll say, but also how you think the recipient will perceive it.

We often focus on the message that we want to send, and the way in which we'll send it. But if our message is delivered without considering the other person's perspective, it's likely that part of that message will be lost.

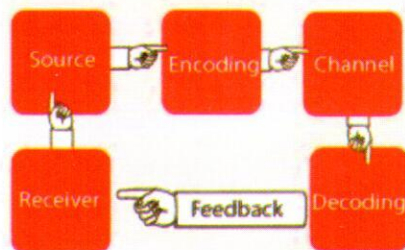
To communicate more effectively:

- Understand what you truly need and want to say.
- Anticipate the other person's reaction to your message.
- Choose words and body language that allow the other person to really hear what you're saying.

With written communication, make sure that what you write will be perceived the way you intend. Words on a page generally have no emotion – they don't "smile" or "frown" at you while you're reading them.

When writing, take time to do the following:

- Review your style.
- Avoid jargon or slang.
- Check your grammar and punctuation.
- Check also for tone, attitude, nuance, and other subtleties.



If you think the message may be misunderstood, it probably will. Take the time to clarify it!

- Familiarize yourself with your company's writing policies.

Another important consideration is to use pictures, charts, and diagrams wherever possible. As the saying goes, "a picture speaks a thousand words."

Choosing the Right Channel - Along with encoding the message, you need to choose the best communication channel to use to send it. You want to be efficient, and yet make the most of your communication opportunity.

Using email to send simple directions is practical. However, if you want to delegate a complex task, an email will probably just lead to more questions, so it may be best to arrange a time to speak in person. And if your communication has any negative emotional content, stay well away from email! Make sure that you communicate face to face or by phone, so that you can judge the impact of your words and adjust these appropriately.

When you determine the best way to send a message, consider the following:

- The sensitivity and emotional content of the subject.
- How easy it is to communicate detail.
- The receiver's preferences.
- Time constraints.
- The need to ask and answer questions.

Decoding – Receiving and Interpreting a Message

It can be easy to focus on speaking; we want to get our points out there, because we usually have lots to say. However, to be a great communicator, you also need to step back, let the other person talk, and just listen. This doesn't mean that you should be passive. Listening is hard work, which is why effective listening is called active listening.

To listen actively, give your undivided attention to the speaker:

- Look at the person.
- Pay attention to his or her body language.

- Avoid distractions.
- Nod and smile to acknowledge points.
- Occasionally think back about what the person has said.
- Allow the person to speak, without thinking about what you'll say next.
- Don't interrupt.

Empathic listening also helps you decode a message accurately. To understand a message fully, you have to understand the emotions and underlying feelings the speaker is expressing. This is where an understanding of body language can be useful.

Feedback - You need feedback, because without it, you can't be sure that people have understood your message. Sometimes feedback is verbal, and sometimes it's not. However, feedback through body language is perhaps the most important source of clues to the effectiveness of your communication. By watching the facial expressions, gestures, and posture of the person you're communicating with, you can spot:

- Confidence levels.
- Defensiveness.
- Agreement.
- Comprehension (or lack of understanding).
- Level of interest.
- Level of engagement with the message.
- Truthfulness (or lying/dishonesty).

As a speaker, understanding your listener's body language can give you an opportunity to adjust your message and make it more understandable, appealing, or interesting. As a listener, body language can show you more about what the other person is saying. You can then ask questions to ensure that you have, indeed, understood each other.

Feedback can also be formal. If you're communicating something really important, it can often be worth asking questions of the person you're talking to to make sure that they've understood fully. And if you're receiving this sort of communication, repeat it in your own words to check your understanding.

(((CATALYSTS NEWS)))

• 3 Day Offsite trip to Mussoorie

In a race to improve efficiencies and to achieve targets employees perform like machines and this is where our Annual Offsite Trip come into picture.

3 day off-site Trip to **Mussoorie** (The Golden Spa & resort) from 03rd -05th October 2013. The aim was to revitalize and re-energize the employees, building team spirit and getting everyone's creative juices flowing again.

This Adventure offsite trip combined an element of fun and subtle learning in employees and joy of being together with nature. New employees gel themselves with the old ones & participated in dancing, sight seeing of Kemptay fall, motivational games, nature walk and many more other activities.

Following awards were given to the employees:

The Highest Sales Growth Rate was achieved by the South Grain Team - Rishabh Khanna, Nikunj Tomar & Balumahenderan.

The Highest Sales Target was achieved by Mithlesh Choubey, Dinesh Sharma & Nikunj Tomar

The Highest Value from New Business was achieved by again the South Grain Team - Rishabh Khanna, Nikunj Tomar & Balumahenderan.

But the limelight was on the Hrushikesh Mandole for achieving the **Best Salesman of the Second Quarter**.

Our Managing Director, Mr. Munish Madaan distributed the prizes & appreciation certificates to the winners.

Mr. Madaan congratulated and praised all performers for their extraordinary efforts which help the team to accomplish its key goals.

He appreciated the leadership skills and team building abilities of the South Grain Team that have resulted in successful completion of goals".

HAPPY BIRTHDAY

Catalysts Group wishing you all the best today throughout the coming year!

<i>Name</i>	<i>Designation</i>	<i>Date of Birth</i>
Mithlesh Kr. Choubey	Dy. Manager - BD	01 Oct
Ashish Sharma	Dy. Manager - BD	14 Oct
Ajay Kumar	Executive- Accounts	28 Oct
Rishabh Khanna	Asstt. Manager - BD	31 Oct

HAPPY ANNIVERSARY

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

<i>Name</i>	<i>Designation</i>	<i>Date of Marriage</i>
Ashwini Agrawal	DGM - BD	14 Oct

WELCOME TO THE CATALYSTS GROUP

<i>Name</i>	<i>Designation</i>	<i>Date of Joining</i>
Akash Pratap Singh	Dy. Manager - BD	07 Oct
A. Vinay Kumar	Jr. Manager - CS	08 Oct
Dev Pal	Trainee - CS	14 Oct
Shivi Sharma	Trainee - CS	15 Oct

The Catalysts Group Offsite Trip - Mussoorie



Sugar industry seeks Govt's help to start crushing

Source: ISMA

Battling cane arrears and a downward trend in prices amidst sluggish demand and high stocks, the Indian sugar industry has sought Government intervention to kick-start the crushing operation in the new season.

"The sugar industry has suffered substantial losses in the last season. At current prices, it is not sustainable to run the industry," said M. Srinivasan, Chairman of the Indian Sugar Mills Association (ISMA).

He said millers were facing tough time in raising working capital as bankers, who have put the sugar industry in the negative list, have refused to extend loans if the cane pricing was not rationalised according to the Rangarajan Committee recommendations.

Srinivasan suggested that the Government arrange bank loans to meet the working capital needs and waive interest up to 12 per cent, as in 2007-08, which could give Rs 3,500 crore liquidity to the mills. He further said the Government should hike the import duty on

sugar to about 40 per cent or stop the inflow completely to stabilise the prices. So far, about 7.5 lakh tonnes of sugar is estimated to have been imported of which, about 3.5 lakh tonnes have been re-exported.

Abinash Verma, Director General, ISMA, urged the Government to facilitate exports of 3 mt-5 million tonnes of sugar over the next eight to 10 months to reduce the inventory build up or else the sugar balance at the end of current year in September 2014 could touch as high as 10 mt. At current global prices, exports are not viable and the Government should assist exports by providing the transport subsidy as it had done in 2006-07 and 2007-08.

Also, the Government should allow conversion of existing sugar stocks into ethanol, Verma said.

Calling for an implementation of cane pricing reforms as recommended by the Rangarajan Committee, Vice-Chairman of ISMA Ajit Shriram said cane prices in Uttar Pradesh have seen an increase of 75 per cent in the past four years, while the sugar prices have risen by only six per cent during the period. "The Indian sugar industry is paying nearly twice that of Brazil toward the cane costs to produce one kg of sugar and that's simply not sustainable," Shriram said. In Uttar Pradesh alone, the cane arrears for last season stood at Rs 2,400 crore, while the all-India figures are estimated at Rs 4,000 crore. Sugar prices have been on the decline over the past few months on ample domestic supplies and bearish trend in global prices.

The ex-factory prices in Uttar Pradesh, which stood at Rs 31 a kg two months ago, now stand reduced to Rs 29.50, while the production cost is estimated at Rs 34-35.



"We cannot have low sugar, high cane price and a viable industry," Shriram said. With banks refusing to extend credit, the cane arrears will start building up from day one of the crushing season this year as millers have no money to pay, Shriram said.

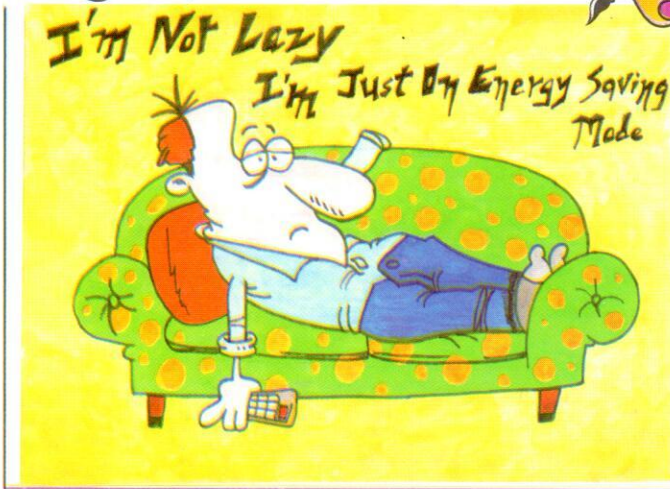
"If the UP Government makes its stand on cane pricing clear, we can re-approach the banks for working capital," Shriram said. The UP Government had fixed cane price of Rs 280 for a quintal last year.

M.G. Joshi, Managing Director of the National Federation of Sugar Co-operative Federation, said the situation was alarming and that crushing would begin only after the mills and farmers decide on quantum of first advance payment in Maharashtra. Last season, the Maharashtra mills paid an average cane price of Rs 2,650 a tonne, excluding the harvesting and transportation cost of Rs 500/tonne.

ARTISTIC CORNER



Akansha Sharma
Executive - R&D

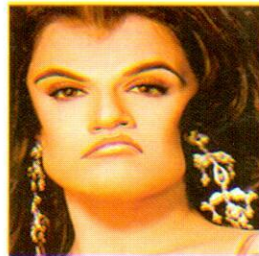


Guess the Picture ?????

" Bollywood Celebrity "

Start guessing the picture. To win, email your entries - magazine@thecatalystsgroup.com

Vol 8 winner is **Mr. G.V.R.K. SASTRY (DISTILLERY CHEMIST - Sri Sarvaraya Sugars)** and the correct answer - **Mother Teresa.**



Congratulations !!! soon you'll receive your goody bag.

Find the Faults

Can you find the faults in the picture ?

send your views / entries at magazine@thecatalystsgroup.com to win a supriz gift.

Vol 8 winner is **M.PRAKASH (DISTILLERY CHEMIST - Sri Sarvaraya Sugars)** and the correct answer - **Roman number 4th is misprinted & 9th, 11th are interchanged.**



Congratulations !!! soon you'll receive your goody bag.

लड़की होना पाप नहीं है ।



Nisha Saini
Wife of Pradeep Kr. Saini

लड़की होना पाप नहीं है
हाँ, लड़की होना पाप नहीं है।



खानदान की इज्जत लड़की,
खानदान की रैनक लड़की,
पर जब लड़की पैदा होती,
सबका मुख मुरझा जाता है,
घर में मातम छा जाता है।

लेकिन, अब तो युग भी बदल गया है।
बदल गई युग की परिभाषा,
अब लड़की है कुल की दीपक ।
अब लड़की है देश की आशा,
अब वह सब कुछ बन सकती है।

दफ्तर में क्लर्क बनी है।
अस्पताल में नर्स व डॉक्टर,
जज, वकील, बैरिस्टर बनी है।
पुलिस-इंसपैक्टर, बस-कंडक्टर
और स्कूल में टीचर बनी है।

लेकिन, अब तो लड़की बोझ नहीं है,
वह भी हाथ बटों सकती है ।
जीविका स्वयं कमा सकती है
दहेज मांगने वालो को भी,
गहरी चपत लगा सकती है।

लड़के से नाम बाप का
लड़की से भी हो सकता है,
फिर भी लड़की के होने पर
क्यों वह नाक चढ़ा जाता है
सबका मुख मुरझा जाता है,
घर में मातम छा जाता है।