

Jan. '06 Issue
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ADVANCED

ENZYME TECHNOLOGIES LTD

Where ENZYME is Life





Events



AETL had witnessed Diwali Puja on 30th Oct. 05 at Thane Office. The whole family of AETL had gathered on this occasion for the ceremony. Here are some memories ...





Hello and Welcome to the "Enzyme World" !!

I am very glad to announce that Advanced Enzyme Technologies Ltd. is launching its very first in-house newsletter "Enzyme World" with this January '06 issue. This is an endeavor to get AETL family together sharing the information across the industry, providing a right platform for every one to contribute.

Enzymes form a very basic need for all Lives! All 3 actions; creation, maintenance, and destruction; happen only using ENZYMES by Nature! Also only NATURE has solutions to all the problems of our existence. This itself means if we understand ENZYMES, we can understand Life & we can solve all our problems using these very intelligent task oriented Bio-molecules called Enzymes! This is the basis of our unique concept called Enzyme Therapy for providing Natural solutions to Global Health & Living.

To transform anything, we do need Energy. Nature has ability to transform anything! Nature does this transformation using these very Intelligent molecules called Enzymes. ENZYMES are ENERGY channelising molecules. For modifying or transforming any natural or naturally derived materials; enzymes can play much more significant role.

This clearly brings us to the Economic Potential of this whole business of Enzymes. Purely in Healthcare of human being, the business of various Pharmaceutical Companies which sell "drugs" with "known acceptable side effects" is worth about US \$ 600 Billion per year. The market for ENERGY Oil, Electricity, etc is Trillions of Dollars!

As you all know, AETL has achieved leadership through innovative products & solutions, customer centric approach, state-of-the-art R&D with highly qualified professionals. We have been successful evolving a concept called "Enzyme Therapy" providing complete natural solution concept for global health.

We have been known as Advanced Biochemicals Ltd. for last 15 years. Few months back, while I was discussing the mission & vision of our Company; it became very clear that we must name our company more appropriately. This made us change the name from Advanced Biochemicals Ltd where Biotechnology is Life to Advanced Enzyme Technologies Ltd. where ENZYME is Life!

Today, we are among Top 10 enzyme manufacturers in the entire world with customers spread over 30 countries, this achievement has been possible just because of you all. Without instrumental support from all of you has brought our company at this stage. We are clearly now targeting a very rapid growth for AETL and are embarking on creating a new wave of Eco-friendly solutions using ENZYMES.

"Enzyme World" is a pool of information not only for the employees but it is also a transparent glass through which our network of dealers, distributors, formulators and some of our prestigious customers would be linked with us. With the help of "Enzyme World", you can be in link with the latest and upcoming trends, news in the industry and also what is happen

"Enzyme World" is created to provide you the mix of information and opinion that you will find useful. I would like each of you to participate, interact, and contribute in this ENZYME EVOLUTION !!

JAI GURUDEV

C. L. Prathi





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Enzymes in Pharmaceutical Industry



Mr. N. Y. Patil
Business Head - Pharmaceutical

At **Advanced Enzyme Technologies Ltd.** Pharma division deals into **Digestive enzymes, Anti Inflammatory enzymes and Probiotics.**

Digestive Enzymes:

The enzymes bring about digestion of carbohydrates proteins and fats from the food we eat. During illness, aging and food allergy, we have to supplement digestive enzymes externally. **Advanced Enzyme Technologies Ltd.** manufactures products like

Fungal alpha amylase	: digestion of carbohydrates
Bacterial alpha amylase	: digestion of carbohydrates
Pepsin	: digestion of proteins
Pancreatin	: digestion of carbohydrates, proteins & lipids
Lactase	: digestion of lactose
Cellulase	: digestion of fibers
Hemicellulase	: digestion of fibers
Papain	: digestion of proteins
Ox bile extract	: helps in digestion of fats

Anti-inflammatory Enzymes:

Advanced Enzyme Technologies Ltd. manufacture Unlike, many anti-inflammatory agents available in the market, Enzymes have an advantage over conventional drugs that it doesn't have side effects. Anti inflammatory enzymes also bring about faster healing by making access of other drugs to the treatment site.

Anti-inflammatory and analgesic agent

Serratiopeptidase:

Peptizyme SP (Enteric Coated Serratiopeptidase)

Trypsin chymotrypsin mix

Bromelain : used as anti-inflammatory and digestive aid

Probiotics:

Probiotics are defined as live microorganisms that may beneficially affect the host upon ingestion by improving the balance of the intestinal microflora. The use of microorganisms in food fermentation is one of the oldest methods for producing and preserving food. Much of the world depends upon various fermented foods that are staples in the diet. **Advanced**



Enzyme Technologies Ltd. manufactures two major probiotics namely; **Lactic Acid Bacillus** and **Saccharomyces Boulardii**.

We are also into the process of developing newer products to make the human life healthier better to live !!

Recent Introductions:

SEBkinase : **Cardio management**

Mecobalamin : **Central nerve system rejuvenator**

Advanced Enzyme Technologies Ltd. is having all the prime pharmaceutical players as their regular clients under their camp.



Compiled by:

Dr. Vadiraj Jahangirkar,
Technical Manager-Pharma

SUCCESS STORY

Animal Healthcare and Nutrition



Mr. Puneet Taplu
Business Head - Animal
Healthcare & Nutrition

It all started during the month of Sep.' 04. AETL had already captured 60% of the domestic market share in the Bulk Enzymes market of the Animal Healthcare and Nutrition Industry. Being the leader in Animal Healthcare Enzymes market, AETL realized the scope and potential benefit of marketing its own branded formulations in to the market. Having the vision of successfully marketing its unique branded formulations, AETL started working on launching the operations and developing a brand pull and loyalty for its self developed unique products in various segments like Bovines, Poultry, Equines, Ovines and Aqua in the Animal Healthcare & Nutrition arena. Today its products are available in the market catering to these above mentioned segments.

Cattle: The continuous research in animal nutrition and healthcare resulted in an unique Bio-Feed Supplement blend of Enzymes and Probiotics for improving the milk production in Cattle. The product has also proven to maintain uniformity in the fat and SNF percentage in the milk thus produced.



During January 2005, AETL launched Animal Nutrition and Healthcare Operations was launched in Cattle segment with the introduction of products for improving milk production, for ruminal disorders and for fertility disorders in Cattle as mentioned below..

BoviSEB: Unique Bio-Feed Supplement blend of Enzymes and Probiotics for improving the milk production in Cattle. BoviSEB® has also proven to maintain uniformity in the fat and SNF percentage in the milk thus produced.

CombiSEB: Ideal eco-friendly solution for digestive disorders and is a combination of Enzymes, Amino acids, Probiotics, Saccharomyces boulardii, Magnesium Trisilicate and Soya bean meal thereby proving to be the best solution for Anorexia, Diarrhea and other digestive disorders.

BoviPAR: Perfect and ideal blend Enzymes, Vitamins and Minerals which, when in combination play a vital role in all major functions of the body like Metabolic processes, Hormone synthesis, Blood and Tissue Formation thereby controlling and curing reproductive problems like delayed maturity, Anoestrus, Non optimal function of reproductive system...

Poultry: One of the enzymes, phytase found in India. Phytase reduces the use of expensive supplemental inorganic phosphorus.



Phytate is an antinutritive factor, which when hydrolyzed gives better performance in animals. Since phytase has been used in poultry, aquaculture farmers are benefiting in controlling the algal bloom due to the reduction in ground water phosphorus levels. This shows that the phosphorus content in the poultry litter has come down

due to usage of phytase which ultimately leads to the reduction of phosphorus in ground water.

In Poultry segment, our cocktail blend of enzymes are fast gaining pace and leaving the competition way behind and proving to be a brand leader in broiler segment and in layers and breeders segment too.

MaxiGest: Maxigest® is a blend of enzymes to improve the FCR in broilers and layers

SEBPhytose MG/2MG: SEBphytase® is a phytase enzyme to improve utilization of bound phosphorus.

Aqua: Enzymes serve as catalysts for chemical reactions, being utilized but not consumed in the process. They bring together other molecules in such a way that the chemical reaction can take place.

AQUATRENZ®: An unmatched blend of Probiotics & Enzymes fortified with vitamin C. It has been developed to best suit the nutritional requirements of Fish, Prawns and Shrimps for better and optimum utilization of Feed, enhanced growth, immunity build up, reduced stress, mortality and for secured profits.



AQUASEB®- SWP: A specially designed product and comprises beneficial bacteria which when administered in combination have shown synergistic effect to biodegrade soluble organic pollutants ensuring maintenance of optimum pH and alkalinity thereby reduces stress and mortality.

Equines: Equines are prone to food enzyme deficiencies and to the array of nebulous symptoms related to this situation by supplementing them with digestive enzymes, the exocrine pancreas function is relieved and the metabolic enzyme bank account does not have to be diverted to compensate for the lack of food enzyme of the modern diet!

We have ExclZyme EQ EXCLzyme®EQ A clinically proven Natural, Anti-inflammatory and Pain Reduction Enzyme formula. EXCLzyme® EQ is a 100% non-animal origin enzyme for Equines, which contains vegetative systemic enzyme formulation that helps reinforce the body's defense mechanisms.



We are once again going to prove our superiority over competition and future products like ParaSEB BV, an enzyme based anthelmintic for Bovines, will create revolution in animal health industry, in India, for which we are heading with a great pace.

Canines: AETL has just entered into the market of canines' nutrition. In this category, AETL offers GumSEB which is an effective edible gel developed from non animal origin natural enzymes. GumSEB shows natural anti-microbial, mild abrasive and humectants properties. GumSEB also helps in controlling bad breath as well as tartar built up in canines.

With the introduction of all the revolutionary products, AETL is rapidly emerging as the fastest growing company in biotechnology sector of Animal Healthcare & Nutrition Industry, providing cost effective eco-friendly solutions for improved health.

Enzymes and your Fabric



Mr. Rajesh Samel
Business Head - Textile



With the increasingly important requirement for textile manufacturers to reduce pollution in textile production, the use of enzymes in the chemical processing of fibres and textiles is rapidly gaining wider recognition because of their non-toxic and eco-friendly characteristics. They can be safely used in a wide selection of textile processes such as de-sizing, scouring, bleaching, dyeing and finishing, where the alternatives are very harsh chemicals whose disposal into the environment causes many problems. Enzymes are used in the the textile industries in various processes. Lets understand each process in bit more detail and AETL's role into it.

Desizing:

Cloth as it comes from the loom is not a finished product. It has to be treated in a series of processes before the final article is obtained. These processes are collectively known as finishing operations. There are basically two types of processes involved:-

•Removal of impurities (this includes Desizing)

Application of various chemicals e. g. dyes, softeners, etc.

We must consider both the impurities that are present in the fiber itself and the impurities that have been deliberately applied during the processing, i.e., the size. To ensure good conditions for desizing, it is necessary to understand some of the properties of enzymes being used. In particular, the influence of temperature, pH and stabilisers on enzyme is of great importance as these factors will determine how much enzyme is needed and how long the desizing reaction will take. AETL has following products for Desizing:

Rapidenz COOL: Low temperature amylase enzyme (Liquid)

Rapidenz HT 40L: High temperature Amylase enzyme (Liquid)

Supersize: Medium temperature amylase enzyme (Powder)

Bio-scouring: The cotton fibre consists of the natural impurities like proteins, pectins, fats, waxes and natural oils which are hydrophobic in nature. Due to these hydrophobic impurities the accessibility of cotton fibre to the dyes and chemicals is almost nil. So the scouring operation is carried out to remove the above said impurities. Conventionally the scouring was carried out by using strong alkali like caustic along with some solvent based wetting agent which increases the effluent load tremendously; moreover the handle of materials becomes harsh. The bioscouring is done at relatively low pH and temperature so the effluent load and the energy consumption is minimum with improved properties of the material than that of conventional. The bioscouring products

offered by AETL is ADDSCOUR.

Peroxide Removal: The residual peroxide in the bath and on the fabric after peroxide bleaching oxidizes the reactive dyestuffs resulting in the corresponding loss in the depth of shade or patchy dyeing. The residual peroxide can be removed by using Catalase enzyme; moreover the water and energy can be saved by using catalase. AETL has introduced **ADDOX** series of enzymes for hydrogen peroxide decomposition.

Bio-polishing:

The protruding fibres and fluff on the fabric surface results in scattering of light in different directions causing dull appearance of the fabric and reduced aesthetic value. the protruding fibres or fluff can be removed by using the cellulase enzymes which gives the brightness and good internal breaking in the fabric/garments resulting in internal softness and surface smoothness. AETL has SEBRITE series of enzymes to impart biopolishing effect with different finish on various fibres.

Neustrastone NC : Neutral cellulose for bio polishing

Denisoft : Acid cellulose for bio polishing

Softzyme : Acid cellulose for bio polishing

SEBrite BP : Acid cellulose for biopolishing

BioFading: The look of denim garment depends entirely on different finish. Use of various cellulases play an important role to impart different look and finish to garment. The performance of a product during garment washing depends not only on the enzymes but also on the ingredients used in the formulation. AETL has done extensive research to impart unique look to the garments. The product range and its usages are mentioned as below:



Coldfade 3535 : Ambient temperature fader (Powder)

Denibrade N 30 : High activity medium temp. fader

Denicell/ Denifade : Medium Temp. Fader (Liquid)

Fadex 500 : Medium Temp. Fader (Powder)

Silk-processing Aid: Degumming is the basic step for silk fiber preparation. Silk fiber has outer protective layer of Sericin. Removal of sericin will help for further finishing of silk to impart even dyeing and softness. Conventionally, degumming process is being carried out with soap and soda ash but the alkaline conditions damage the silk fibroin. To ensure less damage to fiber over chemical processing, AETL offers **ADDSILK** for silk treatment and also **Degumase P** for Silk Degumming.





Enzymes Long Known but yet Unknown !!



Sarang Pandit
Product Manager - Nutraceuticals

Without enzymes, life could not exist. The use of enzymes in the diagnosis of disease is one of the most important benefits derived from the intensive research in biochemistry since the 1940's. The general perception about enzyme is that, its digestive in nature, but the fact is that digestion is one of the last function that enzyme does. Recent research conducted has shown that perfect blend of enzymes can actually help prevent various symptoms. Some typical application of enzymes are in Pain management i.e manage Joint Pain and Inflammation, Boost immune function, Enhance Cellular Repair, Control Allergies and retard the aging process. As life today is full of stress and strain, the enzyme levels in the body get depleted very rapidly causing all sorts of health problems, if this enzyme level is replenished, all major health related problems could be satisfied. Now we have one such product that can be Vital in improving overall health.

Introducing

EXCLzyme™ EN

The Clear Choice!

EXCLzyme™ can be used by all of us daily to improve health and remain fit. This will enable us to remain disease free for as long as we live.

Not only this, but EXCLzyme™ EN can be used in various indications across segments as seen below.

SURGERY

- Post Operative oedemas & haematomas
- Prevention of inflammation of stitchings
- Ecchymosis: The passage of blood from ruptured blood vessels into subcutaneous tissue, marked by a purple discoloration of the skin.

ENT

- Acute & chronic sinusitis
- Fractures of the nose
- Tonsillitis and Pain following tonsillectomy

GYNAECOLOGY

- Salpingitis: Inflammation of Fallopian tube/Ovary
- Lateral episiotomy: Incision of the perineum during childbirth to ease delivery
- Inflammation after perineal surgery Post partum mammary congestion
- Perineal laceration and oedemas: (laceration-a jagged wound or cut)
- Pelvic inflammatory disease
- Engorgement of Breasts in puerperiu

DENTISTRY

- Dental infections
- Maxillofacial surgery (MaxilloEither of a pair of bones of the human skull fusing in the midline and forming the upper jaw)

ORTHOPAEDICS

- Rheumatoid Arthritis & Osteo Arthritis
- Post Traumatic Oedema: An excessive accumulation of serous fluid in tissue spaces or a body cavity
- Soft tissue injury
- Fractures & Dislocation
- Sports injury, sprain

GENERAL INDICATION

- Helps to relieve inflammation, pain, muscle soreness
- Acceleration of healing process
- Enhance penetration of antibiotics.
- Reduces post surgical Inflammation and edema.

Dosage for EXCLzyme™ EN is 1 or 2 TID for 3-4 weeks, 30 mins before meals or 60 mins after meals or as recommended by a physician.

EXCLzyme™ EN has been tested and tried by so many doctors in Mumbai and results have been simply exemplary. I must say EXCLzyme™ EN has been a boon to us. With this I would like to thank Advanced Enzyme Technologies Ltd. for providing everyone with such a great product.


Nurturing Lives
ADVANCED
BIO-NUTRACEUTICALS LTD

Makers of

VegPanzyne®

HemiSEB™

DigeSEB™



Live
Healthy
Naturally

Enzymes and Leather Industries



Mr. Dipak Roda
General Manager - Marketing

Enzyme, a protein sourced from Animal, Plant and Microbial sources is being used in Leather Industries as a Bio Catalyst with a Living Protein. The art of the reaction is a digestion of a protein by its controlled reaction on collagen fibre. The enzymes of different kinds, like Lipase, Protease and Cellulase have different kinds of reaction with Natural Fats, Collagen fibril and Carbohydrates present in a triple Helical collagen Structure.

Applications of Enzymes:

SOAKING Soaking is the first operation in the tannery wherein the hides and skins are cleaned and softened with water. Soaking is necessary for solubilization and elimination of salts and globular proteins contained within the fibrous structure of hides and skins.

UNHAIRING Dehairing is one of the main operations in the beamhouse. Enzymatic dehairing is suggested as an environmentally friendly alternative to the conventional chemical process⁶.

- (i) Significant reduction or even complete elimination of the use of sodium sulphide.
- (ii) Recovery of hair of good quality and strength with a good saleable value.
- (iii) Creation of an ecologically conducive atmosphere for the workers.
- (iv) Enzymatically dehaired leathers have shown better strength properties and greater surface area.
- (v) Simplification of pre-tanning processes by cutting down one step, viz. bating.
- (vi) A significant nature of the enzymatic dehairing process is the time factor involved

DEGREASING Degreasing is an essential step in the production of glove and clothing leather. In this process there is removal of excess natural fats from greasy skins. The presence of natural grease in raw hides and skins, especially woolly sheep skins, results in various defects, viz. fatty spues, uneven dyeing and finishing, waxy patches in alum-tanned leathers, and pink stain on wet blues¹. During the degreasing operation in the pre-

tanning process, the fat or grease is removed from the interfibrillary spaces of the skins to facilitate the even penetration of tanning materials, fat liquors, and dyes, etc. Degreasing helps to obtain soft and pliable leather for garment manufacture.



BATING The main object of bating is to remove some of the non leather-forming proteinous materials like albumins, globulin, and mucoids from hides and skins, and to allow splitting up of collagen fibres to facilitate the penetration of tanning materials and other processing chemicals, thereby giving the finished leather the desired characteristic properties like feel, softness, pliability, etc.

Beam House products:

- SEBsoak : Soaking Bio-Enhancer
- SEBbate Alkali : An Alkali Bate
- SEBlime : Unhairing Bio-Censor
- SEBdegrease : Bio Degreaser

Wet End Products:

- SEBbate Acid : An Acid Bate
- SEBdefat : A Bio-Enhancer for Natural Fat Removal
- SEBfold : A Bio Conditioner

AETI has all customized solutions to offer our clients to all these applications to give the superior quality of leather. To name a few of our established products and doing remarkably well in the market.



Role of Enzymes in Brewery / Distillery and Sweetener Industries



Mr. Surendra Rao
Business Head - Grains

Brewery:

The brewing process involves the extraction and breakdown of carbohydrates (e.g. from malted barley or adjuncts) to make a sugar solution. This sugar solution is used as a nutrient source for anaerobic yeast growth, to break down the simple sugars, releasing energy and producing ethanol and carbon dioxide as by-products. The major biological changes occurring in the brewing process are catalyzed by naturally produced enzymes from barley and yeast.



However, when poor or variable quality malts or a high percentage of adjuncts are used, there is often the requirement for additional

exogenous enzymes to provide efficient and consistent sugar conversion. A number of problems are frequently encountered at the later stages of the brewing process; these can easily be overcome by the addition of exogenous enzymes. Filtration problems are often encountered due to the presence of non-starch polysaccharides such as β -glucan (β -glucan). The degradation of mash β -glucan by the addition of exogenous β -glucanases has been demonstrated to decrease wort and beer viscosity and improve filtration.

The formation of haze in finished beer during storage, particularly in cool conditions, can be caused by the precipitation of small quantities of protein. To eliminate this problem, treatment with proteolytic enzymes is often favoured. It can be seen in the modern brewing process, that exogenous enzymes have become important tools to allow for production of excellent quality beer.

Main usages of Enzymes in Brewery:

- Controlled and efficient carbohydrate breakdown
- Improved beer filtration

Removal of chill haze and polysaccharide hazes:

High temperature-stable enzymes

A new enzyme for cold filtered beer

AETL has the following products in brewery that are growing very rapidly in the market.

Proganoxyme : Reduces the Viscosity & Increase the Filtration rate of the Wort

Multizyme : Replacement of Malt Enzymes

Distillery : Conservations of petroleum oil has been a major concern for all nations due to its fast depleting natural resources. Research has proved that blending fuel alcohol with petrol up to 10% is economical and eco-friendly as it produces less toxic fumes and conserves petrol. This saves the environment in two ways. **Petroleum conservation** and **lesser air pollution**.



Hence all the distilleries are now aiming at producing alcohol to cater to these oil companies and are called fuel alcohol. Generally alcohol produced from molasses is used as fuel alcohol. Hence distilleries has been putting up grain plants to cater to the liquor market as the yield from the grains are better and the alcohol quality is more compatible for producing good liquor. Enzymes are a essential commodities for the grain alcohol industry and play vital role in degrading the grains to lower sugars. The following products in Distillery are having very good market from AETL.

SEBstar HTL : High temperature amylase for Liquidification

SEBamyl GL : Saccharifying Agent

Sweetener Industry: Sweetener's industry produces glucose, maltose, dextrose of different specifications and cater to the confectionary, cold drinks, pharmaceuticals, food and other



industry. Glucose can be produced in 2 ways. - **Acid hydrolysis** and **enzyme hydrolysis**. Most people now prefer enzyme hydrolysis as these are specific in actions and can produce sugars of various types and grades. As people are nowadays more aware of sweet related disease like diabetes, there is more demand for these

specific sweeteners.

Starxyme HT 120L: To Liquefy the Adjuncts, Grain Starch

Dextro 300L: A Saccharification Enzyme

Alphamyl: Produces more Fermentable Sugar

Bakery Industry and Enzymes



Mr. Shivshankar Giri
Sr. Executive - Technical Services - Bakery



In bakeries, the quality of the wheat flour varies as a consequence of natural variation, time of year or inconsistencies in milling. Nowadays, to improve consistency and efficiency, enzymes (such as xylanase, α -amylase, protease, glucose oxidase and lipase) are added.

Throughout the World, about 85 million tons of wheat flour is used every year to make bread, and a not inconsiderable quantity is thrown away due to its becoming stale. This occurs because the bread loses moisture, causing the bread to become hard within a few days. To slow this effect down an enzyme called maltogenic amylase, obtained from microorganisms, is added to the flour. This alters the structure of the starch enabling it to retain moisture better and thus stay fresher for longer

Food without Enzymes? Impossible!!!

Human has used the activities of Enzyme in the Preparation and Processing of food for thousand of years. The Processing of Flour to make Bread and of grape to make wine etc. It is only in more recent history man has been able to exploit the activity of enzymes in more specific ways to refine and improve food for storage & consumption. The advent of modern Biotech has and will continue to have great impact on the food Industry.

Why Enzymes???

- Specialized tools and are specific, economical & clean
- Indispensable elements in every living organism
- Safe
- Eco-friendly
- Saves energy
- Completely Biodegradable

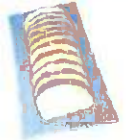
Why Enzymes in Bread???

The activity of Amylase is important for improving the texture, structure and softness of Bread.

Role of Enzymes in Bread:

- Starch on hydrolysis produces Glucose and CO_2 as byproduct.
- Fungal Amylase produce reducing sugars helps in color of final loaf of Bread.
- Also it gives better handling properties & fine crumb Structure.
- Improves Elasticity.
- Gives better volume.
- Less tough dough.

- Improve volume.
- Softness in Crumb.
- Shelf life.
- Bleaching effect.
- Improved Crumb Structure due to lipid protein interaction.



In food production, enzymes have a number of advantages:

- They are welcomed as alternatives to traditional chemical-based technology, and can replace synthetic chemicals in many processes. This can allow real advances in the environmental performance of production processes, through **lower energy consumption** and **biodegradability**.
- They are **more specific in their action** than synthetic chemicals. Processes which use enzymes therefore have **fewer side reactions and waste by-products**, giving **higher quality products and reducing the likelihood of pollution**.
- They allow some processes to be carried out which would **otherwise be impossible**. An example is the production of clear apple juice concentrate, which relies on the use of the enzyme, pectinase.

AETL develops a wide and continuously evolving range of bakery enzymes to fulfill all the needs of the bakery trades. In bakery industry, AETL has the following products for various purposes.

Product	Application
SEBamyl X 50 P	SEBamyl X 50 P gives golden crust colour and extra loaf volume to bread
SEBake® GFD	Bread/ Pao improving enzyme formula
SEBake®	Ready to use enzymatic Bread Improver
SEBake® HM	SEBake® HM increases productivity of glucose & sweet biscuits
SEBake® PR	Optimizes gluten structure & improves the quality of cracker/sweet biscuits
SEBake® PP	SEBake® PP works at lower dosage than traditional Papain. Also gives better volume
SEBake SW	SEBake SW is a readymade bread improver for developing softness, color, volume and shelf life of san
SEBake SB	SEBake SB is a specially designed bread improver for milk and sweet breads
SEBake Cake Gel	SEBake Cake Gel is a unique cake improver for eggless cake and cake with eggs
SEBake Premix	Idlis, Dosas, Dhoklas, Uttappas and Meduvadas
SEBake Soft	Chapati, Paratha and Roti



Enzymes and your Morning TEA



Mr. Hemant Tripathi
Executive - Business Development - Tea

Processing tea is generally considered the art of tea. It is where many of the subtleties in taste, body, and overall character are created. In its most basic form, it is taking the raw green leaves and deciding whether or not and how much oxidation (or fermentation) should take place before drying them out.



Tea leaves have enzymes in their veins. When the leaf is broken, bruised, or crushed, the enzymes are exposed to oxygen resulting in oxidation. The amount of oxidation depends upon how much of the enzymes are exposed and for how long.

Tea manufacturers usually face different quality problems like thin liquor, dull infusion and brown appearance. These problems mainly depend on the leaf standard and seasonal variations which are beyond an individual's control.

Applications of Enzymes in Tea Processing:



Tea quality greatly depends on the age of the tea leaves. Tender leaves always produce the superior quality tea as compared to older and coarse leaves. Therefore proper plucking is the first step towards making the good quality of tea followed by proper withering, cutting/rolling, fermentation and drying. Each stage involves characteristic changes in the physical and biochemical composition of the leaves and the cumulative effect of these changes are ultimately reflected in the quality of the finished product, namely the black tea. After the drying is over, the leaves are sorted, that is, divided into different grades and made ready for the market. The detailed process understanding is explained as under:

Withering: The prime object of withering is to make the turgid leaf

flaccid and prepare the leaf for next stage to facilitate rolling.

Rolling: The withered leaf is charged in the rollers which vary in size. During this process tea leaf is twisted as a result of repeated rolling action and simultaneously leaf tissue ruptures thus forcing out the cell-sap which spreads as a thin film on the surface of the leaf. Various enzymes and their substrates come in contact and enzymatic oxidation starts at this stage. The green colour of leaf starts diminishing and brown coppery colour of leaf begins to appear.

Fermentation: The term 'Fermentation' is a misnomer and, in fact, it is an oxidative process. During fermentation the leaf changes colour and becomes dark coppery. A typical aroma develops at this stage. Oxidation of catechin / polyphenols by the enzyme polyphenol oxidase is the main reaction of the process that imparts 'tea character' to the black tea.

Drying: During the drying process enzymes responsible for fermentation are inactivated and even after the tea is dry the maturation process continues and tea attains the mellowness a desirable character of Darjeeling teas.

EXTRACTASE..... A Unique Eco Safe Solution from AETL !!

Advanced Enzyme Technologies Ltd. with over 50 years of experience in Enzyme field and thorough study on Tea processor's requirements has come up with a unique Eco-safe Solution "Extractase".

Extractase

EXTRACTASE is a special Pectinase Enzyme that helps to break down pectin cell wall, cementing material of the tea leaves allowing the better release and mixing of tea solids, giving marked improvement in overall quality of tea.

Benefits:

- Improves Brightness and Briskness of Tea
- Improves colour and strength of Tea.
- Thoroughly tested product through UPASI-Tea Research Foundation.
- Permissible as per Prevention of Food Adulteration Act of India.
- Commercially used by several big corporate groups on regular basis.
- Highly cost effective, which makes it affordable to use on regular basis.

Current Scenario.....

Now several Tea processors have started looking for natural alternatives to improve the Tea quality. Few of the Tea Processors are willing to adopt this New Enzyme Application in order to improve upon the existing quality of Tea...but so far awareness level is relatively low.

In spite of enough interest some of them have taken a backseat due to low tea prices and continues market fluctuations. Other countries are offering good quality Tea at competitive rates which has resulted in decline of Indian Tea exports. This scenario affecting demand-supply equation, resulting in lower Tea prices and ultimately hampering overall Tea market.

Biotechnology at its BEST



Bio-Agri Eco-Friendly Solutions



Mr. Puneet Taplu
Business Head - Agriculture

In 1973, Cohen and Boyer transferred a gene from one organism into another.

In 1982, the first biotech plant, an antibiotic resistant tobacco, was developed.

In January 1983, at a meeting of genetic researchers in Miami, three different teams reported success in using *Agrobacterium tumefaciens*, a bacterium, to carry new genes into plant cells, heralding the dawn of modern agricultural biotechnology.

Today India is awaiting second "Green Revolution". Farmers are trying to increase the yields of crops further, but they are unable to do so due to two factors:

1. Further increase in the dose of chemical fertilizers may not result in proportionate increase in the yields.
2. The higher doses of chemical fertilizers may result in phytotoxicity.

But it is certain that these high yielding varieties available at present have some additional potential to give still higher yields than the present one. Data show a difference of 8 million tones of nutrients between required & used in India. In order to narrow the gap between nutrient demand & supply, certain **biological means** are required to de-stress the crop-production system especially the soil environment.

Microbes viz., fungi, bacteria and virus play an important role in boosting the crop productivity. Fungi & virus play the role indirectly being primarily used as **plant protection agents**, while bacteria primarily play the role by acting as **Biofertilizers**. The efficacy of nematodes, viruses and protozoa have shown that the role of these microbes is highly significant in boosting the crop productivity by acting as biofertilisers, growth promoter, weed control agent, disease control & insect control agent/s. They have shown a potential in increasing the crop productivity from 10-25%, if judiciously used. **The emphasis is required to be given on the improvement in the formulation of biofertilizers & bio-control agents.**

THIS IS WHERE THE ROLE OF ENZYMES COME INTO PLAY WHICH ARE IRREPLACABLE FACTORS OF ANY LIVING BEING'S METABOLISM.

For this purpose, **Advanced Enzyme Technologies Limited** ventured into Bio-Agro industry with the emergence of **Advanced Bio Agro Tech Limited**, to specialize in the field of Successful Agro-Production Inputs.

In R&D, a series of products have been made & are in pipeline. All these products have blessings of amalgamation of microbes, effective enzymes & amino acids. These are:-

Advanced Bio Agro Tech Limited offers

AgroSEB - A Biological Yield & Quality Enhancer

SEBcompost - Biocomposting Enhancer

Advanced Bio Agro Tech Limited will also offer in near future

Azotobacter / Azospirillum - For N fixation

PSB - Phosphorus solubilisation

KSB - Potash mobilization

We are already half way through developing

Bio-fungicides, and Bio-insecticides.

This really sounds great for a Green Revolution in true sense...!

This is what we mean by.....an eco-friendly solution for healthy environment

Trials of all the formulations of **Advanced Bio Agro Tech**, at various locations (farmer fields & research institute) has shown that the amalgamation of effective microbes along with effective enzyme complexes & amino acids are highly effective in increasing the Quality of yield and simultaneously the use of Agro-chemical (both fertilizers & pesticides) is reduced dramatically and also improves the soil health.

The next decades will witness biotechnological sciences in Agro industry, improving the quality of life, through improved quality of foods, pharmaceuticals, new industrial materials and a better environment.


ADVANCED
 BIO-AGRO TECH LTD
Revolutionizing Farming
 (A unit of Advanced Enzyme Technologies Ltd.)

Jai Kisan
Jai Jawan
Jai Vigyan





Company News

Identity Changed



Where Biotechnology is Life



Where ENZYME is Life

Dear All,

We are pleased to inform you we have changed our company name to Advanced Enzyme Technologies Limited. Therefore, all our associates namely; dealers, distributors, stockists and our valuable customers are requested to make all the transactions in this name only.

Welcome to AETL Family



Mrs. Jalpa Mehta
Asst. Manager-Corp. Comm.
15th Nov'05



Mr. Vishal Rode
Asst. GM - HR
7th Nov'05



Mr. K. Suribabu
Sr. Business Executive
Animal Healthcare & Nutrition
14th Nov'05



Mr. Sidhartha Chakraborty
Technical Manager Baking
1st Dec'05

CORPORATE OVERVIEW

PHARMA BUSINESS & TECHNOLOGY

ENZYME POWER
A COMPANY WITH A DIFFERENCE

ADVANCED
ENZYME TECHNOLOGIES LTD
Where Biotechnology is Life

FACT - FILE

- Year of establishment : 1958
- Total Revenue FY '04 - '05 : 39.55 Cr.
- Export Revenue FY '04 - '05 : 6.48 Cr.



Mr. V. L. Rishi
Chairman



Mr. C. L. Rishi
Managing Director

Advanced Biochemicals Ltd is a unique biotechnology company in the field of Enzymes and biologically active products manufacturing. The Company is recognized as India's largest enzyme manufacturer serving Domestic and International markets by providing enzymes to diverse industries. Over 25 different industries look up to ABCL as a leader in providing complete natural solutions, because we believe in customer delight.

History: Advanced Biochemicals Ltd was established for the purpose of providing natural and ecofriendly solutions for

various industries. The vision to form this company came entrepreneurial spirit since 1958. The vitality and phenomenal growth of the company are backed by continuous efforts to provide context-specific solutions to the challenges faced by various industries.

Mission: To consolidate as enzyme manufacturer to the world by providing ecofriendly and hightech products that add value and enhance the quality of life and to remain a financially strong, trustworthy and socially responsible organization.

Goal: To create innovative enzyme based products for human healthcare, animal

nutrition and natural product processing for various industries.

Customer Service Policy: Advanced Biochemicals Ltd are committed to increase their customer base and achieve customer satisfaction through:

- On time delivery
- Reduced customer complaints
- Developments of new products and applications

Facilities & Infrastructure: The company has invested over \$ 10 million in establishing well equipped state-of-the-art Research & Development Labs as well as

Pharma Business & Technology

70

Sept-Oct, 2005

WHO cGMP certified manufacturing facilities. This infrastructure includes solid phase fermentation and submerged fermentation facilities. It enables ABCL in providing enzymes worth over \$ 20 million annually.

The world class products thus obtained are either by processing of animal glands or through processing from natural microbial sources.

Research Activities:

A) Healthcare:

They are aiming to transform the existing medical paradigm from cure to prevention by providing specific solutions to one focused on treating and preventing the underlying causes.

ABCL's committed Healthcare Research and Development

is marching ahead to implement the recent advances in biotechnology for commercial applications. The result of which is their emergence as the innovators in the unique "ENZYME THERAPY" Complete Natural Solution Concept for Global Health!

B) Process Industries: The research activities are aimed at providing ecofriendly solutions to



Mr. C. L. Rishi
Managing Director

Using the industry standards, we have expanded our leadership position in enzymes, environmental biotechnology, human health etc. Our specialists has innovative ideas and tries to meet the needs of specific customer requirements. While we think global, our feet is firm and stable in the domestic market too. Our goal is to reach 100 crore by the end of this year.

What made ABCL a leader in Enzyme technology?

Continuous thrust on providing innovative products and solutions

Customer-centric approach

WHO, cGMP and ISO 9001:2000 certified production facilities

State of the art Govt approved R&D facilities

form is formulating tailor made enzyme based solutions which are screened to ensure the individual customer's satisfaction. ABCL is striving to transform the paradigm from cure to prevention. With this focused approach they are committed to the cause of social welfare and treating the underlying causes of the ailments.

ABCL's energetic and distinguished R&D teams is

industries like Textile, Leather, Bakery, Food, Herbal (Tea & Coffee) and Agriculture. With the focus on application development in the processing industries, the main emphasis is on replacing the conventional procedure that involve harsh chemicals and pollution challenges.

Special focus is on developing customer-oriented products to suit their end applications and

Pharma Business & Technology

Sept-Oct, 2005

COMPANY NEWS



AETL Animal Healthcare & Nutrition Div. had participated in Poultry Show held at Bangalore on 8-9th Dec. 05. Here are some glimpses . . .



The view of the stall of AETL



Mr. Puneet with AETL's colleagues sharing light moments



Mr. Puneet explaining the customers about AETL and its products

● Increase in exports by 65% (half Yearly) and overall increase in sale by 39%

Our R&D strength gives us clear goals to tap lucrative international markets and hence EXPORTS is major Thrust Area for AETL. We intend to increase our exports, many fold in years to come.

At the same time, we are expanding our scope of products and services in select industrial and healthcare segments in India. We are also targeting Agriculture in India since India is an AGRICULTURE - ECONOMY. We hence shall improve our Income at rapid pace in India and abroad. We are looking forward to increase our exports by 65% and total organizational sale increase by 39%. In very near future, we are targeting our reach in **more than 29 countries** and many more to come in couple of forthcoming years.

● Expansion under progress. To multiply capacity by 5 times

In past 15 years, we have learned many facets of Enzyme Technology. Our unique knowledge in Fermentation technology helps us to set up such facility at about 30% cost than anywhere in the world.

This aspect gives us an Unique position & hence we see that we shall have a very rapid rise in our sales in next decade. To meet the future expansion of markets & products, we are setting up 3 new plants. One plant is being set up at INDORE SEZ to cater to growing International market. One plant near Shahpur (dist Thane) is being set up to cater to our growth in Textile, Leather, and Food Industries in India. One plant is being set up at JALNA (Maharashtra) to meet our future demands in the field of Animal Nutrition & Agriculture Bio-Fertilizers & Bio-pesticides.

ERP in AETL !!

Dear AETLites,

We are very happy to announce that AETL has stepped again further towards modernization through implementation of ERP (Enterprise Resource Planning) for smooth and centralized functioning of all the processes inside the organization. ERP would help us to serve our customer better with more accuracy with lesser efforts with the help of technology.

ERP attempts to integrate all departments and functions across a company onto a single computer system that can serve all those different departments' particular needs. ERP combines them all together into a single, integrated software program that runs off a single database so that the various departments can more easily share information and communicate with each other.

AETL has always positioned itself as a "CUSTOMER FOCUSED ORGANIZATION" and with ERP it has endeavored to achieve the highest level of CUSTOMER DELIGHT !!

Birthdays



Jan 1

Mr. S. O. Patil
Technician - Process

Jan 1

Ms. Neelima Shirke
Biochemist

Jan 5

Mr. Bhushan Hiwase
Apprentice

Jan 5

Ms. Ketki Takalkar
Trainee - R & D

Jan 7

Mr. Ashish Seth
Executive - Application
Development

Jan 11

Mr. Sidhartha Chakraborty
Technical Manager Baking

Jan 12

Mr. Sanjay K. Singh
Regional Sales Manager
(grain Business)

Jan 16

Mrs. S. Iyyer
Executive - Marketing
Services

Jan 18

Ms. Sharmishta Chatterjee
Jr. Microbiologist

Jan 22

Mr. Prasanta K. Sahu
Sr. Executive - Accounts

Jan 22

Ms. Pragyan Roy
Tr. Research Asst.

Jan 23

Mr. Yogesh Bourde
Asst. Microbiologist
(Staff)

Jan 26

Mr. Arun Baith
Staff

Jan 26

Mr. S. M. Chaudhary
Supervisor (Boiler)

Jan 27

Mr. Sangeeth Mohan
Regional Manager

Jan 27

Mr. Prabodh Kulshrestha
Regional Sales Manager
(animal & Nutrition Health Care Div)

Jan 28

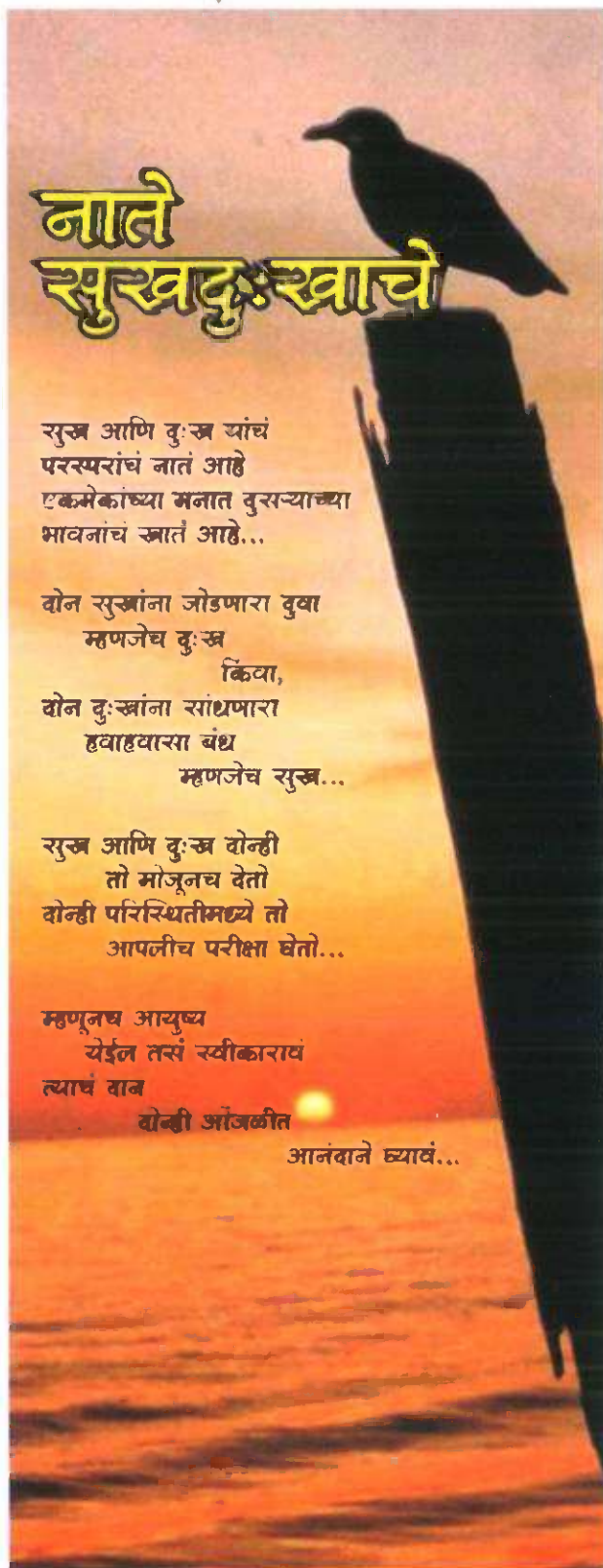
Mr. S. K. Kasaliwal
Jr. Officer

Jan 30

Mr. Vinod Karia
Tr. Officer



Making the Difference



नाते सुखदुःखाचे

सुख आणि दुःख यांचं
परस्पररांचं नातं आहे
एकमेकांच्या मनात दुरव्याच्या
भावनांचं स्मृतं आहे...

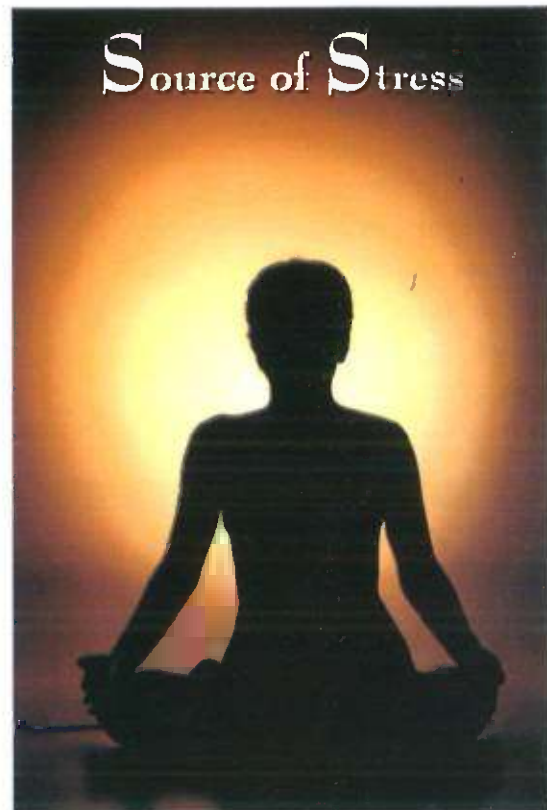
वोन सुखांना जोडणारा दुवा
महजचेच दुःख
किंवा,
वोन दुःखांना सांधणारा
हवाहवासा बंध
महजचेच सुख...

सुख आणि दुःख दोन्ही
तो मोजूनच देतो
दोन्ही परिस्थितीमध्ये तो
आपलीच परीक्षा घेतो...

महजूनच आयुष्य
येईल तसं स्वीकारायं
त्याचं वान
दोन्ही आजळीत
आनंदाने घ्यावं...

Mr. Yatin Vani

Executive - Application Development - Oii



Source of Stress

A group of working People got together to visit their University lecturer. The lecturer was happy to see them. Conversation soon turned into complaints about stress in work and life.

The Lecturer just smiled and went to the kitchen to get an assortment of cups - some porcelain, some in plastic, some in glass, some plain looking and some looked rather expensive and exquisite.

The Lecturer offered his former students the cups to get drinks for themselves.

When all the students had a cup in hand with water, the Lecturer spoke: "If you noticed, all the nice looking, expensive cups were taken up, leaving behind the plain and cheap ones. While it is normal that you only want the best for yourselves, that is the source of your problems and stress. What all you wanted was water, not the cup, but we unconsciously went for the better cups.

"Just like in life, if Life is Water, then the jobs, money and position in society are the cups. They are just tools to hold/maintain Life, but the quality of Life doesn't change."

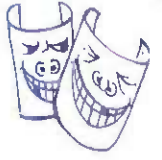
"If we only concentrate on the cup, we won't have time to enjoy/taste the water in it."

Ahila Sriram

Executive - Application Development - Bakery



Entertainment



A man walks into a drug store and asks the pharmacist, "Do you have any acetylsalicylic acid?" "You mean aspirin?" asked the pharmacist. "That's it, I can never remember that word."



Receiving The Bouquet



A new business was opening and one of the owner's friends wanted to send flowers for the occasion. They arrived at the new business site and the owner read the card; it said "Rest in Peace".

The owner was angry and called the florist to complain. After he had told the florist of the obvious mistake and how angry he was, the florist said, "Sir, I'm really sorry for the mistake, but rather than getting angry you should imagine this: somewhere there is a funeral taking place today, and they have flowers with a note saying, "Congratulations on your new location."

Liability for the Calf

A motorist, driving by a Texas ranch, hit and killed a calf that was crossing the road. The driver went to the owner of the calf and explained what had happened. He then asked what the animal was worth.

"Oh, about \$200 today," said the rancher. "But in six years it would have been worth \$900. So \$900 is what I'm out."

The motorist sat down and wrote out a check and handed it to the farmer.

"Here," he said, "is the check for \$900. It's postdated six years from now."



"How do they expect us to learn time management when every hour here feels like three hours, a week feels like a year, and the weekends fly by like ten minutes?"

General Knowledge Quiz

- Who standardized the use of Indian Standard Time?
 - Lord Mountbatten
 - Lord Minto
 - Lord Curzon
 - Lord Dalhousie
- The operation codename, in which India successfully conducted nuclear tests at Pokhran on May 11, 1998 is?
 - Operation Saamna
 - Operation Shakti
 - Operation Hanuman
 - Operation Shatru
- Convex lenses are used for correction of?
 - Long-sightedness
 - Short-sightedness
 - Cataract
- Which among the following is known as The Britain of the South?
 - Colombo
 - New Zealand
 - India
 - Adelaide
- Who was the first man to walk on the moon?
 - Louis Armstrong
 - Buzz Armstrong
 - Jack Armstrong
 - Neil Armstrong
- Light consists of a bundle of energy called?
 - Quanta
 - Quantum
 - Atoms
 - Numus
- Eli Whitney invented?
 - Mad Cow's Disease
 - the Cotton Gin
 - whisky
 - the automobile
- Which nationalist leader was arrested in 1908 for supporting the extremist cause in the Marathi paper Kesari?
 - Jawaharlal Nehru
 - Gopal Agarkar
 - Bal Gangadhar Tilak
 - Veer Savarkar
- Who is known as father of Computers?
 - Charles Babbage
 - Marc Andreessen
 - Bill Gates
 - Shanon
- SOHO stands for?
 - Small Office Home Office
 - Simple Obligations High Obligations
 - State Of High Omega
 - Statue Of Hillton Orfo

Send your answers at jmehta@enzymeindia.com within one week to win exciting prizes



Introduction of Key People in AETL



Mr. C. L. Rathí
Managing Director



Mrs. S. C. Rathí
Director



Mr. Dipak Roda
GM - Marketing



Mr. B. P. Rauka
Chief Finance Officer



Mr. Piyush Rathí
Head - Business Development



Mrs. Saylee Pradhan
Head - Application Development



Mrs. Shilpa Risbud
Head-Nutra Product Development



Mr. Kishore Rathí
Head - Projects



Mr. Mukund Kabra
Director - Operations



Mrs. Mangal M. Kabra
GM - Formulations



Dr. Anil Gupta
Head - R & D



Dr. Satish Pagare
Head - Production



Mr. Bhaskar Manolkar
AGM - Administration

॥ जय गुरुदेव ॥



ADVANCED
ENZYME TECHNOLOGIES LTD

Where ENZYME is Life
(An ISO 9001 : 2000 Company)

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