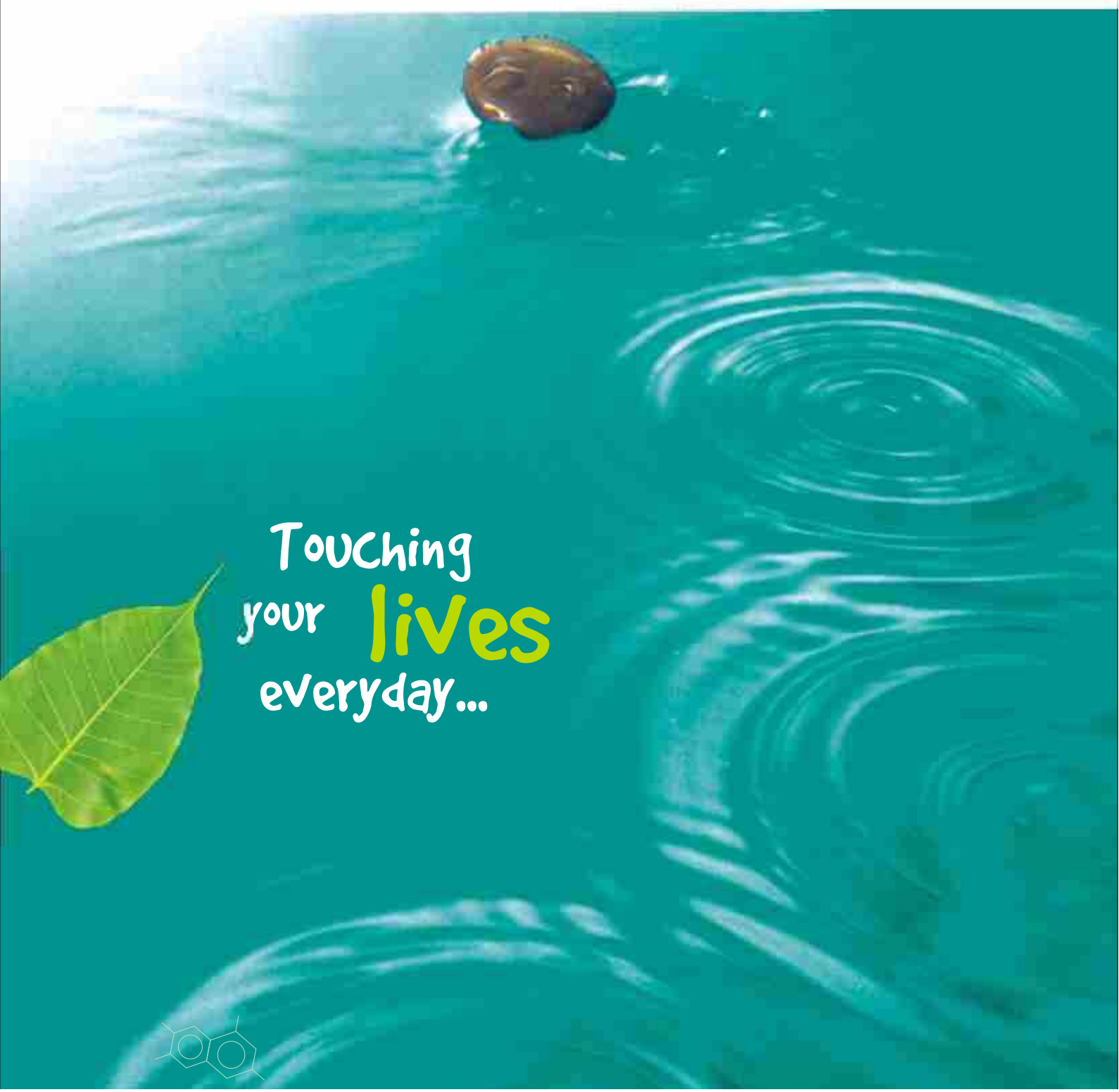
May-June '06 Issue

ENZYME WORLD



Bi-monthly in-house newsletter from

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

ENZYME WORLD

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Touching your lives everyday...

FROM THE DESK OF MANAGING DIRECTOR

Dear All,

I am very glad to present you the third issue of **Enzyme World**. We have received very encouraging responses from several Experts who have welcomed previous 2 issues of **Enzyme World** with great enthusiasm.

In this issue, we are primarily presenting you few of our new developments for solving problems of **Animal Health, Textile/Garment Processing, and Baking Industry.**

Gurudev Poojya Sri Sri Ravi Shankarji few times urged all the devotees to improve living of rural people & farmers. 70% of India's 1 billion population lives in villages with agriculture as main source of income for them. By helping them to earn merely $100/year extra through ***Biotechnology Revolution*** can add whopping $ 70 billion every year in Indian economy! With this view, I spoke to all scientists at **AETL** & results are truly very good. We have now developed a complete range of enzyme based products to take care of agriculture + Animal Health! May it be mestitis or metritis, or de-worming, or mal-nutrition; we have found economical, chemical free, all natural solutions!! These products have shown that any milking cow can enhance the milk output by whopping 80-85% when they are taken care using our ***BoviSEB***. Our de-wormer called **ParaSEB BV** also has shown that by using appropriate Enzymes; we can de-worm any animal! The resultant output is better health for Animals. India has world's biggest Animal population. In ancient India, it was called a big wealth. **AETL** has decided to rebuild this national wealth with our innovative approach. We plan to use innovative marketing approach too so that we can reach over 100,000 villages in next 12 -16 months itself. **AETL** intends to use over 1000 marketing people in rural areas to work for this mission.

Use of Enzymes in textile & garment processing is very well known. We have decided to expand the scope & spectrum. Recently we have launched series of ***Cold Temperature Desizers, Bio-Scouring Enzymes, & Bleaching solutions*** using Enzymes! With the help of biotechnology, some new garment finishing enzyme blends are developed by the team of **AETL** scientists. Many more new areas are under research activity at **AETL.**

In Baking, over 2 years of very painstaking research has given new breakthroughs. India is a very big sub-continent. The variation in wheat flour quality coupled with baking technology variations, & taste variation all over the country; we had a very big task at hand. But I am very proud to state that the **AETL** Team of food technologist has responded to this challenge in a very splendid fashion. We are now launching a new range of Pav, Bread, and Cake Improvers for every baker in Indian subcontinent. Food is very integral part of our living. In fact, food also nourishes mind. Hence, at **AETL**, we have decided to take care of this very vital part of our existence. We shall be also launching series of products to cater to typical Indian food needs idli, dhokla, sev, potato chips, and various sweets production! We also are creating products to take care of chapati, & papad!

Well, I invite your suggestions. If you have any problem while processing any product, you very well can call on us! We shall find an eco-friendly, economical, acceptable solution for YOU!

Jai Gurudev !

C. L. Rathi
Managing Director

ANIMAL HEALTHCARE

"Importance of Exogeneous Enzymes in Ruminants"

Experiments on usefulness of exogenous enzymes in ruminants were conducted by the scientists during early 1960. But the responses were variable. Also production of exogenous enzymes was expensive at that time hence it was not economically feasible to apply these preparations. Hence no effort was made to determine the mode of action of these products. Recently reduction in the fermentation cost together with more active and better defined enzyme preparations have prompted to re-examine the role of exogenous enzyme in ruminant production. Exogenous enzymes exert number of effects both on the gastrointestinal microflora and on the ruminant animal itself. The physiological response to exogenous enzymes is multifactorial in origin. The efficacy of enzymes also dependent upon the method of its application.

Enzymes are naturally occurring biocatalysts produced by living cells to bring about specific biochemical reactions. Enzymes are derived from bacteria, fungi and plants.

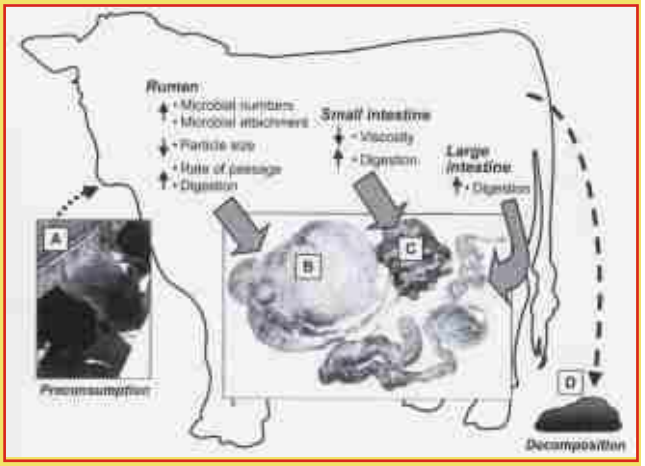
In ruminants enzymes are used to catalyse the degradative reactions by which substrates are digested into their chemical components i.e. Simple sugars, amino acids and fatty acids. These are in turn used for cell growth either by ruminal microorganisms or by the host animals.

In ruminants degradation of cellulose and hemicellulose requires number of enzymes. The diversity of enzyme activities present in commercially available enzyme preparations is that wide variety of substrates can be targeted by a single product.

SCHEMATIC REPRESENTATION OF EFFECTS OF ENZYMES IN RUMINANTS

Exogenous enzymes alter feed utilization in ruminants either trough their effects on the feed prior to consumption or through their enhancement of digestion in rumen and/or in the post ruminal digestive tract. Pre-consumptive effects of exogenous enzymes are due to release of soluble carbohydrates or due to removal of structural barriers that limits the microbial digestion of feed in the rumen. Within the rumen exogenous enzymes act directly on the feed or indirectly stimulate digestive activity through synergistic effects on ruminal microorganisms. Exogenous enzymes remain active in the lower digestive tract contributing to the post ruminal digestion of the fiber or they indirectly improve nutrient absorption in the lower tract by reducing viscosity of the digestive ingesta. They also supplement enzyme activity in the feces thereby contributing by accelerating decomposition of waste

Ultimately the goal of enzyme supplementation is to improve the efficiency of feed utilization in ruminants and reduce waste production.



Enzymin Forte is such unique combination of essential minerals blended with the enzymes which ensures and assures optimum digestibility, absorption of nutrients which in turn leads to better health condition, maximum production, disease resistance etc.

Compiled by: **Dr. N. M. Durape**
Sr. Technical Manager (Animal Nutrition)

ENZYME

Introducing

Advanced Enzyme Technologies Limited has pioneered the use of enzymes and probiotics and is a company with dedication for Animal Healthcare thorough its research and development on combined use of enzymes, probiotics and natural vegetable proteins for all the major group of animals with corporate vision to provide eco-safe solutions.

In endeavor to make our animal our nation's health, we are continuously coming up with developments in more and more sultions for Animal Healthcare. Here are some our new products to come in the market in brief:

ExclZyme BV

ExclZyme BV consists of Peptizyme SP along with bromelain, bioflavonoids and other enzymes having fibrinolytic and proteolytic activity which helps to reinforce the animal's defence mechanism thereby reducing pain and inflammation without any side effects.

- Helps to relieve inflammation, pain and muscle soreness
- Effective in sprains, fractures, rheumatoid arthritis and osteoarthritis.
- Helps in faster tissue repairing, no exudates formation
- Accelerate healing process and rapid suppression of post surgical oedema.
- No side effect, no allergic reactions
- Long acting and can be adopted as a replacement therapy in pathological conditions.
- Enhance penetration

Enzymin Forte

A unique combination of essential minerals blended with the enzymes which ensures and assures optimum digestibility, absorption of nutrients which in turn leads to better health condition, maximum production, disease resistance etc.

PARASEB BV

A drench, Promising to revolutionize helminth control in Bovines and Ovines

ParaSEB BV is a unique combination of proteolytic enzymes derived from papaya latex along with other natural herbal extracts which dissolves on the cell wall of the parasites and prevents the parasitic eggs from developing into larvae thereby interfering in developmental cycle of the parasite..

ParaSEB BV, a broad spectrum dewormer can be very effectively administered for the control and treatment of immature and mature stages of Liver Flukes (Fasciola spp :), round worms, amphistomes etc with no side effects and traces in the milk.

ParaSEB BV can be very effectively administered against parasitic diarrhea and has been found to safe for weak, debilitated and pregnant animals of all stages

SEBLip AQ

SEBLip AQ is one great solution for a more profitable aqua farming

SEBLip-AQ is a polyenzyme blend consisting of Lipase enzyme along with natural antiviral agents and immuno stimulants thereby reinforcing the body's immune system.

Anti viral agents and immuno stimulants in SEBLip AQ enhance the nonspecific defense mechanism of shrimps and prawns against pathogens and reduce mortality due to secondary infection

SEBLip AQ is water soluble and biodegradable formulation with no side effects and maintains the pH and ecological balance of the water thereby improving the survivability of prawns and shrimps and controlling secondary bacterial as well as other infections.

"BoviSEB: A unique Bio-feed supplement"

BoviSEB is a unique Bio-Feed Supplement blend of Enzymes and Probiotics which in combination, turns around the physiology of the cattle. Probiotics involve themselves in an activity of Competitive Exclusion in the gut of the animal and the Enzymes help the animal of absorb the nutrients already available in the feed for better conversion and production.

Competitive Exclusion is a process where Beneficial Bacteria expels the harmful Bacteria stuck to the gut of the animal and takes its place. This activity improves the immune system and prevents diseases and any kind of stress thereby giving a boost to the animals general health and production abilities.

When in combination with Enzymes, especially Fiber degrading Enzymes, the digestibility of the feed improves and the animal is able to absorb the nutrients in the feed, which is the primary source of providing Calcium and Phosphorus in lactating animals.

Please observe that in milking (Lactating) animals, while they are producing milk, the depletion of Calcium is very high and so becomes the loss of Phosphorus. Now, with BoviSEB, we have observed that with the administration of 5 gms per day per animal as per recommended directions, immediately after 3 to 6 days the milk froth (Jaag) will increase and the actual liquid milk will start increasing after 5 to 8 days, and will continue to increase to a substantial level, based on the pedigree and genetic (depends on the breed)constitution of the animal.

BoviSEB has performed in even deshi breeds in India which are low milk producing animals compared to cross breed animals. It is important to deworm the animal before the start of BoviSEB with some effective broad spectrum dewormer. We have 100 gms and 500 gms pack which is sufficient for one animal for 20 days or one animal for 100 days respectively or also one animal for 20 days or for 5 animals for 20 days respectively. Besides production, Ruminal disorders and Fertility problems are also very common problems in Cattle, for which we have very successfully developed, CombiSEB and BoviPAR respectively.

BAKING INDUSTRY AND ENZYMES

After making our presence felt in the Pharmaceutical industry, Neutraceuticals, Animal Nutrition & Healthcare, and Agriculture industries with our enzymetic solutions, AETL is now launching its enzyme based products for the baking industry.

There is a marked trend toward change of eating habits in India and a growing demand for bakery products and convenience foods. As a matter of fact, the Government is also encouraging the consumption of wheat based products and the volume of baking industry is increasing by almost 10% per annum. As the demand for baked products is increasing so also the need for improved and quality products. To meet this demand, we are launching enzyme based products to help the baking industry manufacture high quality of baked products by using our ingredients. Simultaneously we will also be launching our products in the international markets like Sri Lanka, Russia, Bangladesh, Middle - East, Nepal, Egypt and later to other countries as well.

Presently some manufacturers are making chemical based products for this segment, but we will be the Leader in providing enzyme based bread Improvers, Pav Improvers and Cake Improver in coming future. We are coming out with a range of products to cater as per the needs and wants of the customer. Our products are:

SEBake Cake Gel : There are two varieties in this

a. SEBake Cake gel Supreme
b. SEBake Cake Gel Premium

SEBake Cake Improver is designed for producing superior quality delicious cakes with increased volume, spongy, soft with finer crumb structure.

SEBake Cake Gel is ready to use Cake Improver that can be whisked together with other ingredients, thereby reducing mixing time and also it increases batter resistance to mechanical handling before baking.

SEBake Cale Gel can be used for making eggless cakes as well as cakes with eggs. Mix the Cake Gel with sugar and then add eggs and water and mix till the sugar dissolves at slow speed. Add flour and baking powder and mix at high speed for two minutes for maximum volume, then add oil slowly during mixing for one minute in slow speed, bake at 180 degrees C for 25-30 minutes.

For eggless cakes, mix cake gel and sugar. Add all ingredients and mix it for 4 minutes at high speed, bake at 180 degrees for 25-30 minutes.

The SEBake Cake Gel is available in 1 kg. container packed in a 16 kg. corrugated box.

SEBake SW Series: There are four varieties of bread improvers with different dosage levels as per the requirements of the bakers:

Application Details

Product Name	Dosage
SEBake SW 200	100-200 gms per 100 kg flour
SEBake SW 300	200-300 gms per 100 kg flour
SEBake SW 500	400-500 gms per 100 kg flour
SEBake SW 1000	700-1000 gms per 100 kg flour

These enzyme based composition consists of fungal alpha amylase, hemicellulase, pentosanase, strengthening agents, yeast foods and diluents. SEBake SW is easy to use and is to be added to the flour at the time of mixing.

SEBake SW when used in the recipe gives the bread a **GOLDEN CRUST COLOUR, FINE TEXTURE, SOFTNESS, WHITE CRUMB COLOUR, GOOD OVEN SPRING FOR HIGHER VOLUME AND INCREASED SHELF LIFE.**

SEBake SW supplements extra fungal alpha amylases for the weak flour and as it contains special pentosanases which improves gas retention

by removing pentosanases that are cross linked to gluten proteins. These pentosanases would normally hinder the formation of the gluten network that retains the carbon dioxide gas in the dough. It also has Hemicellulase which facilitates the water uptake, reduces stiffness and results in softer breads. It reduces the staling rate, thereby prolonging the freshness of the bread, it also increases the whiteness of the bread. SEBake SW comes in a 1 kg. easy to use pouch pack which are packed in a 20 kg. corrugated box.

SEBake Pav Improver : There are three varieties of Pav improver for the customers to choose from as per their requirements :

Application Details

Product Name	Dosage
SEBake Super PV	100 gms per 100 kg flour
SEBake PV Supreme	100 gms per 100 kg flour
SEBake PV Clasic	100 gms per 100 kg flour

This enzyme based Pav improver contains fungal alpha amylase, pentosanase, strengthening agents, yeast foods and diluents and has to be used with other ingredients at the time of mixing the dough.

SEBake SW supplements the dough with extra fungal alpha amylases which strengthens the weak flour, it produces dextrin, which are further broken down into sugars by naturally as well as supplemented beta amylases thus improving yeast fermentation, which gives the PAV a better VOLUME and GOLDEN CRUST COLOUR. It has special pentosanases which improves gas retention by removing pentosans that are cross linked to gluten proteins. These pentosanases would normally hinder the formation of gluten network that retains the carbon dioxide gas in the dough.

Removing pentosans that are cross linked to gluten proteins. These pentosanases would normally hinder the formation of gluten network that retains the carbon dioxide gas in the dough.

The SEBake SW when used in the recipe, gives the PAV superior performance, better volume, softer pav with whiter crumb colour, reduces the staling rate, there by prolonging the freshness of PAV.

We are working on few other products for the baking industry and will keep on adding new products in this segment as per the need and demand of this industry.

To cater and supply our products to this industry we have put a team of dedicated professionals to mange the operations and also established a wide dealer network. The dealers have been located close to the customers so as to cater the customers effectively. We have an excellent technical team to help our sales force and customers in demonstrating the usefulness and superiority of our products. The technical team will not only be doing demonstrations but will also help our customers in improving their product quality and also give them new recipes and ideas to manufacture value added baked products. The expertise of our technical services team personnel are being made available for the benefit of our customers, they can use them not only for their baking related problems but also our team will be ready to help them in developing new recipes or improving upon the existing ones.

Compiled by: **Mr. Ravi Mathur**
Business Head - Bakery Division

TEXTILE PROCESSING

Bioscouring of Cotton Textiles

A. CONVENTIONAL ERA:

The processing of cellulosic material, as for example cotton fiber, into a material ready for garment manufacture involves several steps: spinning of the fiber into a yarn; construction of woven or knit fabric from the yarn and subsequent preparation, dyeing and finishing operations. Woven goods are constructed by weaving a filling yarn between a series of warp yarns; the yarns could be two different types. Knitted goods are constructed by forming a network of interlocking loops from one continuous length of yarn. The preparation process prepares the textile for the proper response in dyeing operations. The sub-steps involved in preparation are desizing (for woven goods), scouring and bleaching. A one step combined desizing/scour/bleach process can be used (Enzymatic Process offered by AETL).

The processing regime can be either batch or continuous with the fabric being contacted by the liquid processing stream in open width or rope form. Continuous operations generally use a saturator whereby chemicals are applied to the fabric, followed by a heated dwell chamber where the chemical reaction takes place. A washing section then prepares the fabric for the next processing step. Batch processing generally takes place in one processing bath whereby the fabric is circulated through the bath. After a reaction period, the chemicals are drained, fabric rinsed and the next chemical is applied. Discontinuous pad-batch processing involves a continuous application of processing chemical followed by a dwell period which in the case of cold pad-batch might be one or more days.

a. Desizing:

Woven goods are the prevalent form of textile fabric construction. The weaving process demands a "sizing" of the warp yarn to protect it from abrasion. Starch, polyvinyl alcohol, carboxymethyl cellulose, waxes and acrylic binders are examples of typical sizing chemicals used because of availability and cost. The size must be removed after the weaving process as the first step in preparing the woven goods.

The sized fabric in either rope or open width form is brought in contact with the processing liquid containing the desizing agents. The desizing agent employed depends upon the type of size to be removed. The most common sizing agent for cotton fabric is based upon starch. Therefore most often, woven cotton fabrics are desized by a combination of hot water, the enzyme alpha amylase and a wetting agent or surfactant. AETL offers RAPIDENZ HT 40L , A HEAT STABLE ALPHA AMYLASE for desizing of woven fabric / garments. Fabric is subjected to pretreatment with chemicals like wetting / lubricating agents followed by enzymatic treatment. The time and temperature varies from process to process between 15 minutes to 8 - 12 hours and 60^0 C - 100^0 C. The chemicals, including the removed sizing agents, are washed away from the fabric after the termination of the holding period.

In order to ensure a high whiteness and/or a good dyeability, the size and other applied must be thoroughly removed, and it is generally believed that an efficient desizing is of crucial importance to the following preparation processes: scouring and bleaching.

b. Scouring:

The scouring process removes much of the non-cellulosic compounds naturally found in cotton. In addition to the natural non-cellulosic impurities, scouring can remove residual manufacturing introduced materials such as spinning, coning or slashing lubricants. The CONVENTIONAL scouring process employs sodium hydroxide or related causticizing agents such as sodium carbonate, potassium hydroxide or mixtures thereof. Generally an alkali stable surfactant is added to the process to enhance solubilization of hydrophobic compounds and/or prevent their redeposition back on the fabric. The treatment is generally at a high temperature, 80^0 C -100^0 C, employing strongly alkaline solutions of the scouring agent, viz. pH 13 - 14. Due to the non-specific nature of chemical processes not only are the impurities but the cellulose itself is attacked, leading to damages in strength or other desirable fabric properties. The softness of the cellulosic fabric is a function of residual natural cotton waxes. The non-specific nature of the high temperature strongly alkaline scouring process cannot discriminate between the desirable natural cotton lubricants and the manufacturing introduced lubricants. Furthermore, the conventional scouring process can cause environmental problems due to the highly alkaline effluent from these processes.

The scouring stage prepares the fabric for the optimal response in bleaching. An inadequately scoured fabric will need a higher level of bleach chemical in the subsequent bleaching stages.

c. Bleaching:

The bleaching step decolorizes the natural cotton pigments and removes any residual natural woody cotton trash components not completely removed during ginning, carding or scouring. The main process in use today is an alkaline hydrogen peroxide bleach. In many cases, especially when a very high whiteness is not needed, bleaching can be combined with scouring. The combined process does however require higher dosages of bleach chemicals. The optimal temperature for bleaching is 60^0C - 70^0C.

In order to minimize quantity of the expensive hydrogen peroxide, adjuncts such as chelators and stabilizers, sodium silicate and surfactants are often employed. As all of these compounds ultimately find their way into the effluent from textiles processes, it is advantageous to minimize their usage.

B. NEW GENERATION PROCESSES:

a. Enzymatic Treatment of Textiles:

The enzyme Amylase has been used in the textile industry for the removal of size for many years; indeed, it is one of the earliest known industrial applications of enzymes. Cellulase enzymes have been used in garment finishing applications to mimic the effects of stone washing of denim for the past 8-10 years. The use of the enzyme was rapidly accepted due to the environmental and process benefits. The use of cellulases to bio-polish knits to prevent or inhibit pilling is also known. The enzyme Catalase is used in the industry as a milder, more environmentally conscious method to destroy residual hydrogen peroxide in exhausted bleach baths.

Recently, Laccases, in combination with mediators are being used to decrease the environmental and structural damage caused by the use of chlorine-containing bleaching for some garment finishing applications.

The scouring and bleaching operations employ massive doses of caustic chemicals such as sodium hydroxide and hydrogen peroxide at high temperatures. The cost of these chemicals is substantial, both from the standpoint of initial purchase and environmental burden cost upon disposal of the waste from the operations. The non-selective nature of the process also results in structural damage to the cellulose in the cotton. The impurities in cotton are naturally occurring compounds and as such should be able to be hydrolyzed and removed by enzymes. Various enzymes have been proposed to effect a scouring response. Benefits are an avoidance of alkali and a reduced contamination of waste water.

Treatment of raw cotton fiber with pectinase and pectinase/cellulase combinations can be bleached to a greater whiteness with hydrogen peroxide than alkaline scoured raw cotton fiber. Cotton fabric treated with enzymes and subsequently bleached with hydrogen peroxide cannot be bleached to as great a whiteness as alkaline scoured and bleached fabric. Enzyme capable of releasing intact pectin from cotton can have a scouring response; the benefits being a milder treatment with reduced energy and lower cost of water disposal without environment pollution. The harshness of known scouring treatments result in reduced fabric characteristics. Further, the current processes requiring multiple processing steps at different pH and temperature conditions are time consuming and inefficient. Thus, there is a need for an improved scouring process which does not result in a reduction of superior fabric characteristics, as well as a need for more efficient processes.

b. Bioscouring Process Availability From AETL:

Enzymatic scouring is conducted under alkaline conditions, specifically at a pH of 9.0 or greater. The method features a process for treatment of cellulosic material, comprising the steps of treating cellulosic material with an effective amount of the pectinase solution at a pH of 9.0 or above, a temperature of 50^{0}C. or above, in a low calcium environment. The treated material exhibits an enhanced response to a subsequent chemical treatment, such as bleaching. Further, the treated material exhibits superior fabric characteristics, such as whiteness and strength, due to reduction in the harshness of its chemical treatment.

Present process offered by AETL using **ADDSCOUR AND RAPIDENZ HT 40L** brings down the processing time to 1.5 hours - 4 hours.

The combination of the enzyme treatment to produce the enhanced scouring effect with another processing step such as desizing or bio-polishing would greatly extend the industrial utility.

Typical Biosocuring method is - 100% cotton knitted or desized woven textile fabric is treated with ADDSCOUR 1 - 3% OWF at pH range of 9-12 and at a temperature range of 50 - 90^0 C for 2-18 hours. In the case of a grey woven cotton fabric, RAPIDENZ HT 40L 1- 5% OWF fabric is added to the mixture so as to effect a simultaneous desizing and enhanced scouring effect. **SEBRITE BP** dosage during the reaction period can be adjusted so that a simultaneous bio-polishing and enhanced scouring effect takes place.

Optionally, the cellulosic material can be exposed to a chemical treatment such as a bleaching process or a combined scour/bleach process consisting of, for example, the use of hydrogen peroxide or other oxidizing agent. The enhanced scouring effect due to the enzyme action on the cellulosic material has been shown to be more responsive to a subsequent bleach procedure resulting in an enhanced whiteness response. The enzyme effect can be exploited either by the ability to produce a whiter material with the same level of subsequent chemicals or by using a decreased level of chemicals resulting in equivalent whiteness complemented with other superior fabric characteristics.Significant improvement in other critical fabric quality parameters such as the effects on strength, resistance to pilling, water absorbency and dyeability is also observed.

AETL welcomes any further technical queries and process development request.

C. Products Offered By AETL for Fabric Treatment:

1. RAPIDENZ HT 40L	**:** HIGH TEMPERATURE **AMYLASE** FOR **DESIZING**
2. RAPIDENZ COOL	**:** MEDIUM TO LOW TEMPERATURE **AMYLASE** FOR DESIZING
3. ADDSCOUR	**: BIOSCOURING** ENZYME
4. ADDOX 10L	**: CATALASE** AS HYDROGEN PEROXIDE KILLER
5. SEBRITE BP	**: CELLULASE** FOR **BIOPOLISHING**

Compiled by: **Mr. Dipak Roda**
GM-Marketing

NUTRACEUTICALS

EXCLzyme™ EN

The Strongest and Fastest Systemic Enzyme Formulation with no side effects

ENZYME THERAPY FOR ARTHRITIS PAIN

For some people aches and pains in the joints flare up with cold weather. For several million people, however, suffering from arthritis, stiff and swollen joints are the result of a storm in the body's immune system. The body normally produces chemicals that fight off infections. It is when the body turns on itself, and these chemicals practically flood the tissue in the joints, attacking them as if they were the pathogens invading the body, that the ravages of arthritis begin to take their toll on the body.

By Aftab J. Ahmed, Ph.D.
From TotalHealth Volume 21, Number 2

The term arthritis describes a set of symptoms and literally means inflammation (itis) of the joint (arthro). There are different forms of arthritis with the three most common being osteoarthritis, rheumatoid arthritis and gout. Whereas rheumatoid arthritis is caused by a malfunction of the body's immune system, osteoarthritis is the swelling, stiffness and pain in the joints by the wear and tear of the body tissues over decades. As such, osteoarthritis is an age related disease. It is characterized by the breakdown of the joint's cartilage. Cartilage is the part of the joint that cushions the end of the bones. As cartilage breaks down, the bones begin to rub against each other, causing pain and loss of movement.

Osteoarthritis affects mostly middle-aged and older people and its symptoms can range from mild to quite severe. It affects hands and weight bearing joints such as the knees, hips, feet and back. The relatively high incidence of mild osteoarthritis tends to obscure the impact of this disease on the overall health of the population and on more severely affected individuals.

What causes osteoarthritis? The exact mechanisms of the onset of osteoarthritis are not known. Whereas advanced age is a leading risk factor, research shows that osteoarthritis is not an inevitable part of aging. An array of other factors plays a significant role: Obesity, for instance, can lead to arthritis of the knee. Further, people with injuries to the joint because of sports, repetitive movements of one type or another, or accidents may be at increased risk for developing osteoarthritis. Genetic predisposition is suspected to be the main source of the arthritis of the hand.

The standard medical treatment, has been routinely to treat the symptoms with medications such as **non-steroidal anti-inflammatory drugs (NSAIDs).** These medications, however, have serious side effects including headaches, dizziness, ringing in the ears and gastrointestinal problems, which could potentially lead to ulceration and micro bleeding. One of the more pernicious side effects of NSAIDs, which is rarely mentioned, is that they inhibit the repair of the cartilage that, in turn, further aggravates the cartilage destruction and worsens the progression of the condition.

Since there is good evidence suggesting that the depletion of enzymes leads to cartilage destruction, one of the more exciting recent developments has been the availability of orally ingestible systemic enzymes as a nutritional means to alleviate the pain in osteoarthritis. One of the major advantages of oral enzymes is that they do not have any appreciable side effects and are reasonably well tolerated. They work in the body with its own resources to mitigate pain and suffering.

What are systemic enzymes, though? The term systemic enzymes encompass those enzymes that are found naturally in the body. Of course, some of the enzymes found in plants are also included in this term, since they function in a manner similar to those indigenous to the human body. Systemic enzymes should be clearly differentiated from digestive enzymes, which are essentially responsible for aiding the digestive process. In contrast, systemic enzymes exert their beneficial effects at a cellular level replenishing, in advanced years, the declining reservoir of naturally occurring enzymes in cells. These enzymes belong to a category of protein that are referred to as **proteases:** Enzymes, that is, which break down other proteins. Therefore, systemic enzymes may be seen as a pair of molecular scissors that cut and prune.

EXCLzyme™ EN

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Ingredients:

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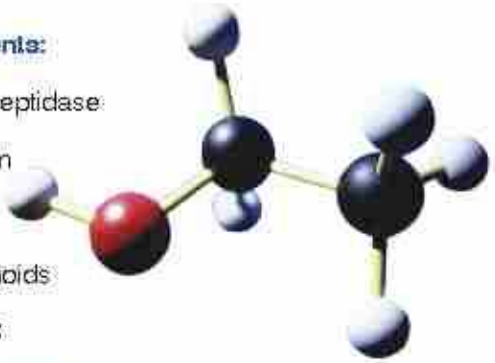
Papain

Bioflavonoids

Vitamin C



Recommended Dosage: 3 capsules, 3 times a day for 6-8 weeks, followed by 2 capsules 3 times a day; 45 mins before meals or 1 hour after meals.

For more information, Please call:

1-800-220-880 OR 2541 1053

Prepared by: **Mr. Sarang Pandit**
Sr. Product Manager (Nutraceuticals)

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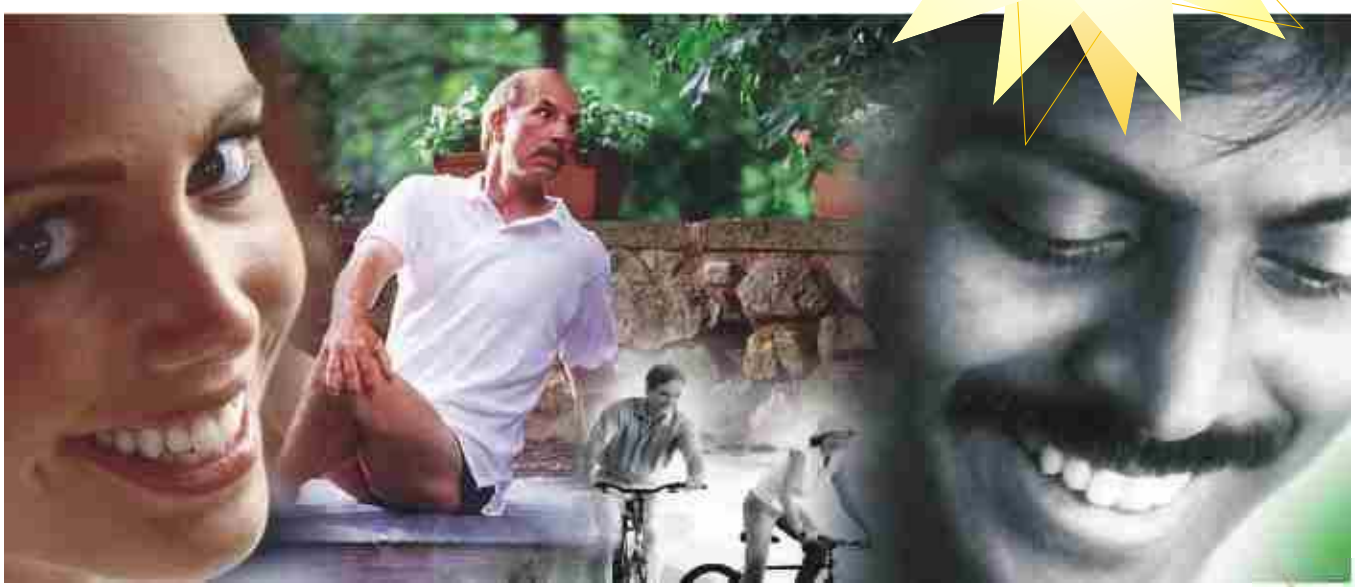

ENVIRONMENT

Advancing towards the 21st century, man has achieved a pinnacle of technological development through excessive industrialization, but at the same time he has lost the ecological balance. Due to that he is now threatened with increased pollution, scarcity of natural resources such as land & water, global warming and disasters like Tsunami, drought. So now, it has become the necessity and responsibility of every individual to maintain the ecological balance and save nature.

Considering all the above facts, **Advanced Enzyme Technologies Ltd.** launched **EnviroSEB** series as a mass movement for environment protection. **EnviroSEB** has proven its spectacular performance through various continuous on the spot trials in curbing pollution & in treating the municipal and industrial effluent has made it the natural choice for the environmentalists, municipal authorities, agriculturalists & industrialists.

EnviroSEB is a solid concentrate made by specially designed blend of heterotrophic microbes and bioenhancers (Enzymes) which occur in nature. This is the result of extensive research and repeated trials made on the field. It is 100% G.R.A.S. (generally recognized as safe) product derived under strictly controlled conditions of fermentation. It converts degraded ecosystem to one that is productive and contains useful microbes. **EnviroSEB** includes microorganisms, which are harmless to human, animal, plant aquatic and marine life.

Important aspects of EnviroSEB:

1. **EnviroSEB** is completely different from all agrochemicals, chemical cleansing agent etc. and its activity is different to that of synthetically produced chemicals.
2. It works on wide range of temperature, salinity and pH values.
3. No special storage condition is required.

Types of EnviroSEB:

- EniroSEB A
- EniroSEB E
- EniroSEB S

EnviroSEB A : For bioremediation of lakes, ponds

Traditional cleaning methods are employed physically to remove water hyacinths and other aquatic plants. This is followed by de-silting operation to increase the depth of the lakes or ponds.

Use of **EnviroSEB A** helps in rapidly reducing suspended solids and increasing the dissolved oxygen in water. A clean, healthy aquatic environment is rapidly created that supports the growth of fishes and prawns.

EnviroSEB E : For efficient effluent, sewage, nullah and gutter/drains treatment

As per the traditional methods, cow dung or sludge from a functional sewage treatment plant is taken to induce microbial activity. The process is slow and takes several days for the system to come to a stable level where it is able to take the capacities it is designed for. Expensive electrical energy is extensively required for proper treatment.

Biochemical energy has come up as an alternative energy source and is more economical as it saves on the electrical costs and time of treatment. **EnviroSEB E** is used to harness this biochemical energy for waste treatment. And to control BOD, COD and solid content of effluent system.

EnviroSEB S: For solid waste composting, suppressing foul odor.

As per the traditional methods, agricultural waste (leaf, farm waste etc.), municipal waste is allowed to decompose by microbial activity in pits, to form compost. The process is very slow requiring several weeks for the compost to form and involves only microbe system.

EnviroSEB S being a combination of synergistic bacteria and bioenhancer to break complex starchy, cellulosic and pectic substances and converts it in to useful smaller biomolecules which can be used as manure effectively. The manure produced from **EnviroSEB** S contains the useful bacteria which on addition to the field thus will maintains the ecological balance of the sytem.

Thus, **EnviroSEB** is versatile product that uses microorganisms found in the ecosystem. It respects nature and does not contain genetically engineered species. The principle of **EnviroSEB** is conversion of disturbed ecosystem to one that is environment and agriculture friendly. Hence use of **EnviroSEB**, ensures a very clean ecology with productive agricultural land that increases profit to the farmer.

Above vision of every human being can easily be achieved through the adoption of **EnviroSEB**.

Compiled By:
Saylee Pradhan
Manager-Application Development

COMPANY NEWS

CHEMSPEC 2006 EXHIBITION, 5-6 APRIL, 06

In order to make our presence stronger in the world wide market, **Advanced Enzyme Technologies Ltd.** had participated in the biggest Chemicals Exhibition in India; ChemSpec' 06 on 5-6 April' 2006 at Bombay Exhibition Centre, Mumbai.

ChemSpec exhibition was very successful as far as the response is concerned. AETL witnessed visitors from all across the world like China, Korea, Japan, US etc.

Mrs. Savita Rathi (Director), Mr. Piyush Rathi (Head-Business Development) and Mr. Dipak Roda (GM-Marketing) from AETL had visited the Exhibition and felt the overwhelming response of the visitors at the Exhibition.

NARRATION OF THE PICS:

Discussing business..
(Dr. Vadiraj and Mr. Patil are interacting with the Korean visitors)

Posing for the Camera at the Exhibition sharing light moments..
Mr. Rajesh Samel (Biz Head-Textile))
Mr. Dipak Roda and Mrs. Savita Rathi

Attending the visitors
(Mr. Piyush rathi, Mr. N. Y. Patil, Mr. Dipak Roda, Mrs. Saylee Pradhan)

At the grand finale..
(Lower L to R) Mr. N. Y. Patil, Mrs. Saylee Pradhan, Mrs. Jalpa Mehta, Dr. Vadiraj Jahangirdar, Mrs. Mithoo Jyxen (Upper L to R) Mrs. Savita Rathi, Mr. Sarang Pandit, Mr. Abhijit Mali)

Advanced Enzyme Technologies Ltd.'s Animal Healthcare and Nutrition SBU had participated in a Fertility Camp held at Mandipeta, U.P. on 20th March,' 06. Dr. Durape (Sr. Technical Manager), Mr. K. Srinivas (Zonal Manager) and Mr. K. Suribabu (Sr. Biz Executive) had demonstrated the application of Bovipar among the Cattle owners and Breeders to create the brand awareness of BoviPar and to give Fertility related solutions in Cattles.

AETL received very welcoming response from the Cattle owners and Breeders and showed huge amount of enthusism for **Bovipar**.

WELCOME TO THE AETL FAMILY

WELCOME TO THE AETL FAMILY

Dr. Jyoti Ramchandani
Research Scientist
DOJ- 1/3/2006

Ms. Neha Nair
Trainee - R & D Analyst
DOJ- 13/03/2006

Mr. Abhijit Mali
Business Development Manager - Pharma Marketing
DOJ- 20/03/2006

Ms. Shalaka Gadkar
Executive - R&D
DOJ- *17/04/2006*

Mr. Laxmikant Khairnar
Manager - IT
DOJ- 19/04/2006

Mr. Ravi Mathur
Business Head - Baking
DOJ- 1/3/2006

Ms. Archana Bajaj
Sr. Executive - HR
DOJ- 16/03/2006

Mr. Shailesh Agarwal
Manager - Taxation
DOJ- 30/03/2006

Mr. Piyush Verma
Consultant
DOJ- 17/04/2006

MAKING THE DIFFERENCE

Promise Yourself

(one the most classic motivational poems)

Promise yourself to be so strong that nothing can disturb your peace of mind.

To talk health, happiness, and prosperity to every person you meet.

To make all your friends feel like there is something in them.

To look at the sunny side of everything and make your optimism come true.

To think only of the best, to work only for the best, and expect only the best.

To be just as enthusiastic about the success of others as you are about your own.

To forget the mistakes of the past and press on the greater achievements of the future.

To wear a cheerful countenance at all times and give every living person you meet a smile.

To give so much time to the improvement of yourself that you have no time to criticize others.

To be too large for worry, too noble for anger, and too strong for fear, and to happy to permit the presence of trouble.

Ms. Jalpa Mehta
Asst. Manager-Corp. Comm.

Don't Quit

When things go wrong as they sometimes will
When the road you're trudging seems all up hill.
When funds are low and the debts are high.
And you want to smile, but you have to sigh.
When care is pressing you down a bit.
Rest, if you must, but don't you quit.
Life is queer with its twists and turns.
As everyone of us sometimes learns.
And many a failure turns about
When he might have won had he stuck it out:

Don't give up though the pace seems slow -
You may succeed with another blow.
Success is failure turned inside out -
The silver tint of the clouds of doubt.
And you never can tell how close you are.
It may be near when it seems so far:
So stick to the fight when you're hardest hit
It's when things seem worst that you must **NOT QUIT.**

Ms. Kamal Chandran
Executive - HR

Balance Sheet Of Our Life

1)	What comes to us	CREDIT
2)	What goes from us	DEBIT
3)	The birth is our	OPENING STOCK
4)	Our ideas are our	ASSETS
5)	Our views are our	LIABILLITIES
6)	The happiness is our	PROFIT
7)	The sarrow is our	LOSS
8)	Your soul is our	GOODWILL
9)	Our Heart is our	FIXED ASSET
10)	Our duties are our	OUTSTANDING EXPENCES
11)	Our friendship is our	HIDDEN ADJUSTMENT
12)	Our knowledge is our	INVESTMENT
13)	Our Patience is our	INTREST
14)	Our Mind is our	BANK BALANCE
15)	Our Thinking is our	CURRENT ACCOUNT
16)	Our Behavior is our	JOURNAL ENTRY

Last but not least!!!!!

17) BAD Things "we" should always DEPRECIATE.

Mr. G. S. Kulkarni
Regional Manager (South 2)

BIRTHDAYS

AETL EMPLOYEES BIRTHDAYS

Name	DOB
May' 06	
Mr. N. M. Varade	May 08
Mr. G.S. Kulkarni	May 10
Mr. Abhijit Mali	May 17
Ms. Ahila Sriram	May 18
Mr. Shivshankar Giri	May 18
Mrs. Mary Ignetious	May 18
Mr. Raju N.G.	May 20
Mr. Surendra Rao	May 22
Mrs. Geetha Ramchandran	May 23
Mr. B. D. Gupta	May 25
Mr. Subal Das	May 29

Name	DOB
June' 06	
Mr. M.S. Patel	Jun 01
Mr. Nitin Baith	Jun 01
Mr. K. L. Rathi	Jun 02
Mr. Manish Tharabad	Jun 05
Mr. Adik	Jun 08
Mr. Prabhakar Shinde	Jun 10
Dr. N.M. Durape	Jun 15
Mr. Manik Salunke	Jun 22
Mr. Vishal Rode	Jun 24
Mr. P. N. Bhavsar	Jun 26

WHAT ARE X-RAYS?

An X-ray picture is really a picture of the shadows cast by the denser materials (like bones) in your body.

These shadows are projected onto a film that has been coated with a sensitive material. The film is developed in a manner very similar to a photograph.

If the doctor suspects that you have a broken bone he will probably take an X-ray picture to check. X-rays are made of the same electromagnetic particles as light but with a much shorter wavelength. These shorter wavelengths allow X-rays to pass through the human body.

X-rays are produced in a special tube. Most of the air is pumped out of the tube. The tube holds a negatively charged electrode called a cathode. Inside the cathode is a tungsten wire which will give off electrons when heated. The tube also contains an anode, or target electrode. The anode is also made of tungsten. When the electrons emitted by the cathode hit the tungsten anode they are stopped abruptly and some of their energy is turned into X-radiation.

X-rays were named by their discoverer, Wilhelm Roentgen. He used the mathematical symbol X, which stands for an unknown, to denote his unknown rays.

HOW COME TEARS COME OUT OF OUR EYES WHEN WE CRY?

Tears flow from our eyes when we cry because they contain chemicals and hormones produced by our bodies.

When we become upset, our brains and bodies overreact and work overtime by producing chemicals and hormones.

Crying helps eliminate these extra chemicals that we don't need.

The chemicals and hormones disappear from our body through the form of tears. As our tears flow, they sooth our sadness or distress by withdrawing these chemical agents.

That is why many people feel calmer or more refreshed after crying--because the tears get rid of these hormones that are produced when we are sad, happy, or distressed.

GENERAL KNOWLEDGE QUIZ

1 Who standardized the use of Indian Standard Time?

a Lord Mountbatten b Lord Minto
c Lord Curzon d Lord Dalhousie

2 The galaxy we live in is called the Milky Way. It is shaped approximately like:

a A round ball b A doughnut
c A pretzel d A flat spiral

3 Unlike most other fish, sharks have no:

a Bones b Teeth
c Gills d Liver

4 The metal mercury:

a Is the hardest known metal
b Is a liquid in room temperature
c Is highly radioactive
d Is extensively used in aircraft construction

5 It is now believed that dinosaurs became extinct because of:

a Viral diseases
b Hunting by early humans
c A worldwide period of climatic cooling
d A meteorite impact

6 Kinetic energy is:

a Life energy, possessed only by living organisms
b Only important at subatomic distances
c Energy of movement
d A rare form of energy sometimes observed in deep space

7 Which two oceans does the Panama Canal link?

a Indian Ocean-Pacific Ocean
b Pacific Ocean-Atlantic Ocean
c Southern Ocean-Pacific Ocean
d Southern Ocean-Atlantic Ocean

8 Golf was first played in which country?

a Ireland b Scotlant
c Japan d Korea

9 Which instrument has keys, pedals and strings?

a Sitar b Guitar
c Drum d Piano

10 What is South America's highest mountain range?

a The Rockys b The Andes
c New Guinea Range d The Sumatra-Java Range

Correct Answers Of Last Issue Quiz

1	d.	skill	6	c.	Polo
2	c.	Ada Lovelace	7	a.	Britannica
3	c.	India	8	d.	to know
4	b.	Endocrine system	9	c.	Mandarin Chinese
5	c.	Abraham Lincoln	10	a.	Carburettor

Last Quiz Winner:

Name: ***Ms. Ahila Sriram***
Designation: ***Exe-Appl. Dev.-Bakery***

ENTERTAINMENT

A Firm !

A paralegal, an associate, and a partner of a prestigious law firm are walking through a city park and they find an antique oil lamp. They rub it and a Genie comes out in a puff of smoke. The Genie says, 'I usually only grant three wishes, so I'll give each of you one.'

'Me first!' says the paralegal. 'I want to be in the Bahamas, driving a speedboat with Tom Cruise.

Poof! She's gone.

Me next!' says the associate. 'I want to be in Hawaii, relaxing on the beach with a professional hula dancer on one side and a Mai Tai on the other.'

Poof! He's gone.

'You're next,' the Genie says to the partner.

The partner says, 'I want those two back in the office after lunch.'

Boss wants too much !!

For thirty years, Johnson had arrived at work at 9 A.M. on the dot. He had never missed a day and was never late.

Consequently, when on one particular day 9 A.M. passed without Johnson's arrival, it caused a sensation. All work ceased, and the boss himself, looking at his watch and muttering, came out into the corridor.

Finally, precisely at ten, Johnson showed up, clothes dusty and torn, his face scratched and bruised, his glasses bent. He limped painfully to the time clock, punched in, and said, aware that all eyes were upon him, 'I tripped and rolled down two flights of stairs in the subway. Nearly killed myself.'

And the boss said, 'And to roll down two flights of stairs took you a whole hour?'

Fact File

1) Chocolate manufacturers use 40 percent of the world's almonds
2) President George W. Bush was once a cheerleader!
3) The United States Postal Service handles over forty percent of the world's mail volume.
4) Forty percent of Americans have never visited a dentist.
5) In 1956, 80% of all U. S. households had a refrigerator, but only 8% of British households had one!
6) If your stomach didn't produce a new layer of mucous every two weeks, it would digest itself.
7) If the chemical sodium is dropped into water it will immediately and violently explode.
8) Most liquid laundry detergents are alive with living organisms that help to break down stains!
9) In Athens, Greece, a driver's license can be taken away by law if the driver is deemed either unbathed or poorly dressed.
10) "Mrs." is the abbreviation of Mistress, which originally was a title and form of address for a married woman. It was always capitalized.