GIA BULLETIN

GURGAON INDUSTRIAL ASSOCIATION

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QUOTE

"Faith is the bird that feels the light when the dawn is still dark."

- Rabindranath Tagore

From the President .....

Policies regarding Air & Vehicular Pollution

India is one of the developing countries that is grappling through the trade-off between development and environment. Vehicular pollution and industrial emissions are two most significant contributors to the pollution. However, the Indian government has made great strides towards improving the air quality and a number of policy instruments have been employed to control and abate pollution.

The government policies were rarely implemented and there was no evidence of a comprehensive plan to tackle the growing problem of air pollution. Disappointed public put more pressure on the government, which led to the implementation of 1986 Environment (Protection) Act, the Motor Vehicles Act of 1988, and the Central Motor Vehicle Rules of 1989. These Acts both set standards to for vehicular emissions for manufacturers and users and owners were obligated to maintain their vehicles so that they would not emit smoke, visible vapor, grit, sparks, or ashes.

Switching to CNG was a great initiative for a country that imports 70% of its oil because it decreases India's dependence on foreign oil and allows India to save valuable foreign exchange. Another major method to curb vehicular pollution was the introduction of metro.

The Supreme Court made two major reformations 2000 onwards which lead to significant improvement in the air quality. The first reformation was the switch to compressed natural gas. Secondly, three industrialized states—Gujarat, Maharashtra and Tamil Nadu—are about to launch the world's first market for trading permits in emissions of particulate matter. Indians may hope that the elected government fulfills its rightful role in protecting their environmental well-being.

Happy New Year.

V.P. Bajaj

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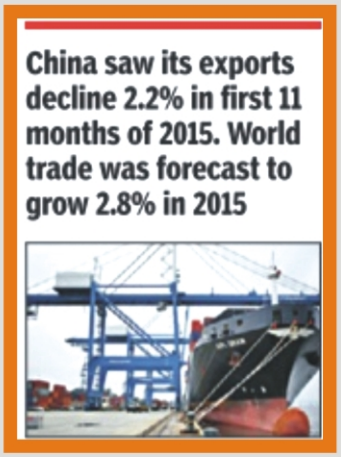
Exports may decline 13% to $270bn in '15-16



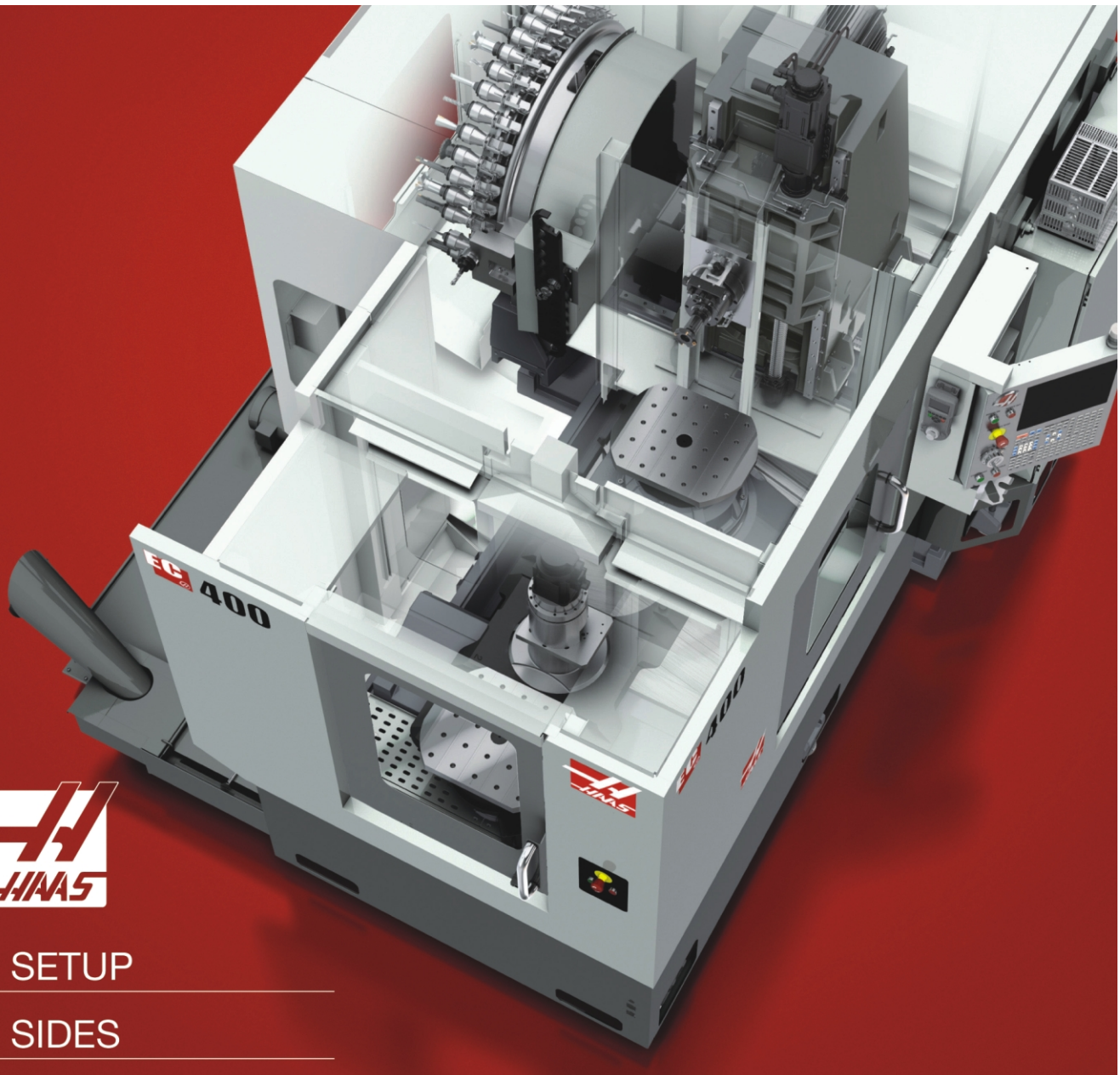
India's exports are expected to decline about 13% to $270 billion in the current financial year due to global demand slowdown and fall in crude oil prices, a top official said on Thursday . The country's merchandise exports had aggregated $310.5 billion last fiscal. According to an official, commerce secretary Rita Teaotia in her presentation during an interaction with the industry chambers including CII and Ficci stated that it would be difficult for India's exports to exceed $270 billion. In 2008-09, the country's outbound shipments were less than $270 billion, according to exporters body Federation of Indian Export Organisations (FIEO). It was around $210 billion in 2008-09. Teaotia has also stated that imports during the fiscal would stand around $390 billion. So the trade deficit would aggregate at $120-125 billion in 2015-16. During April-November this fiscal, exports declined by 18.5% to $174.3 billion. Imports were $261.8 billion and trade deficit was $87.5 billion. The declining exports would have implications for the job market. The numbers assume significance as recently the government had said that there is "no crisis" in India on the export front and there is "no need for alarm". "If exports of petroleum products are excluded, then the decline in exports is only 9.6% in dollars," the ministry had said. During the meeting, which was chaired by commerce and industry minister Nirmala Sitharaman, chambers suggested ways to boost manufacturing, exports and overall economic growth. The commerce secretary had also apprised the chambers about the outcome of the WTO's Nairobi meeting. AGENCIES.

Breakthrough: Insulin-producing cells grown in lab

May Lead To Personalised Cell Therapy For Diabetics

Scientists have successfully converted human skin cells into functional pancreatic cells, a breakthrough that may lead to a personalised cell therapy for diabetics, ending the need for insulin jabs. The new cells produced insu lin in response to changes in glucose levels, and when transplanted into mice, protected the animals from developing diabetes, researchers said. The study will allow scientists to scale up pancreatic cell production and manufacture trillions of the target cells in a controlled manner. "Our results demonstrate for the first time that human adult skin cells can be used to ef ficiently and rapidly generate functional pancreatic cells that behave similar to human beta cells," said Matthias Hebrok, director of the Diabetes Centre at University of California."This finding opens up the opportunity for the analysis of patient-specific pancreatic beta cell properties and the optimisation of cell therapy approaches," said Hebrok. In the study , the scientists first used pharmaceutical and genetic molecules to reprogramme skin cells into endoderm progenitor cells -early developmental cells that have already been designated to mature into one of a number of diffe rent types of organs. With this method, the cells do not have to be taken all the way back to a pluripotent stem cell state, meaning the scientists can turn them into pancreatic cells faster.

After another four molecules were added, the endoderm cells divided rapidly, allowing more than a trillion-fold expansion. The scientists then progressed these endoderm cells two more steps, first into pancreatic precursor cells, and then into fully-functional pancreatic beta cells. "The final step was the most unique and the most difficult, as molecules had not previously been identified that could take reprogrammed cells the final step to functional pancreatic cells in a dish," said first author Saiyong Zhu, a postdoctoral researcher at the Gladstone Institute of Cardiovascular Disease. "This cellular reprogramming and expansion paradigm is more sustainable and scalable than previous methods," said Sheng Ding, a scientist. Bharti Airtel on Monday announced a three-year Rs 60,000-crore investment road map for boosting tele com network capacity , a move coming at a time when Mukesh Ambani prepares to roll out 4G services under his Reliance Jio venture. Gopal Vittal, the CEO of Bharti Airtel, said the company will invest to improve the quality of voice and data services to its customers. "There still are problems with the network...We are still not where we need to be," Vittal said as he outlined steps to improve network quality which include setting up of 1.6 lakh new base stations over the next three years. The investments are also being made at a time when the government has taken a serious view over deficient mobile services as problems such as call drops and poor internet quality hamper customer experience. The entry of Reliance Jio, the ambitious high-speed telecom and entertainment venture of Ambani, is expected to further fuel competition in the domestic telecom sector as Ambani is likely to offer data-intensive services at relatively lower price points.



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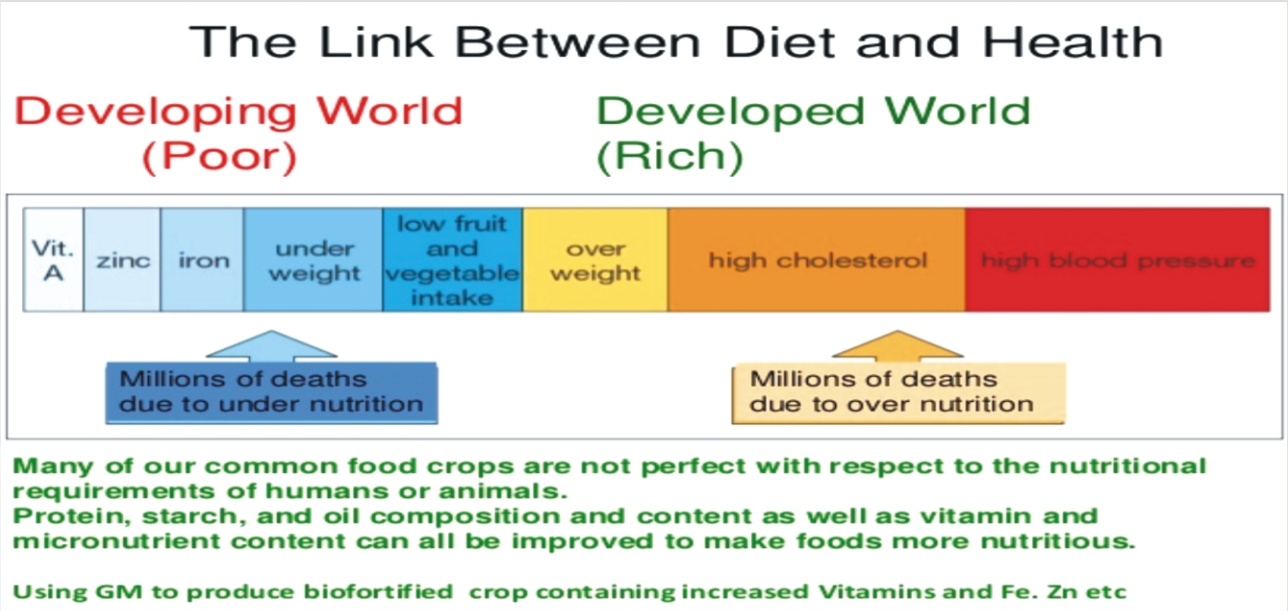
BIOFORTIFIED CROPS FOR IMPROVED HUMAN NUTRITION

By :
Shikha Khandelwal

Great progress has been made over the past decade with respect to the application of biotechnology to generate nutritionally improved food crops. Biofortified staple crops such as rice, maize and wheat harboring essential micronutrients to benefit the world's poor are under development as well as new varieties of crops which have the ability to combat chronic disease.

Billions of people worldwide suffer from an insidious form of hunger, known as micronutrient malnutrition or hidden hunger which is caused by a lack of micronutrients in the diet. The micronutrient malnutrition may damage cognitive development, lower disease resistance in children, and reduce the likelihood that mothers survive childbirth. The consequences of this malnutrition are devastating and can result in blindness, stunting, disease, and even death. Among the critical micronutrients identified by the WHO as most lacking in the diets of the poor are zinc, iron, and vitamin A. Only minute amounts of these nutrients are required for good health, and even survival. A diverse diet that includes fruits, vegetables, and animal products can provide all the required micronutrients.

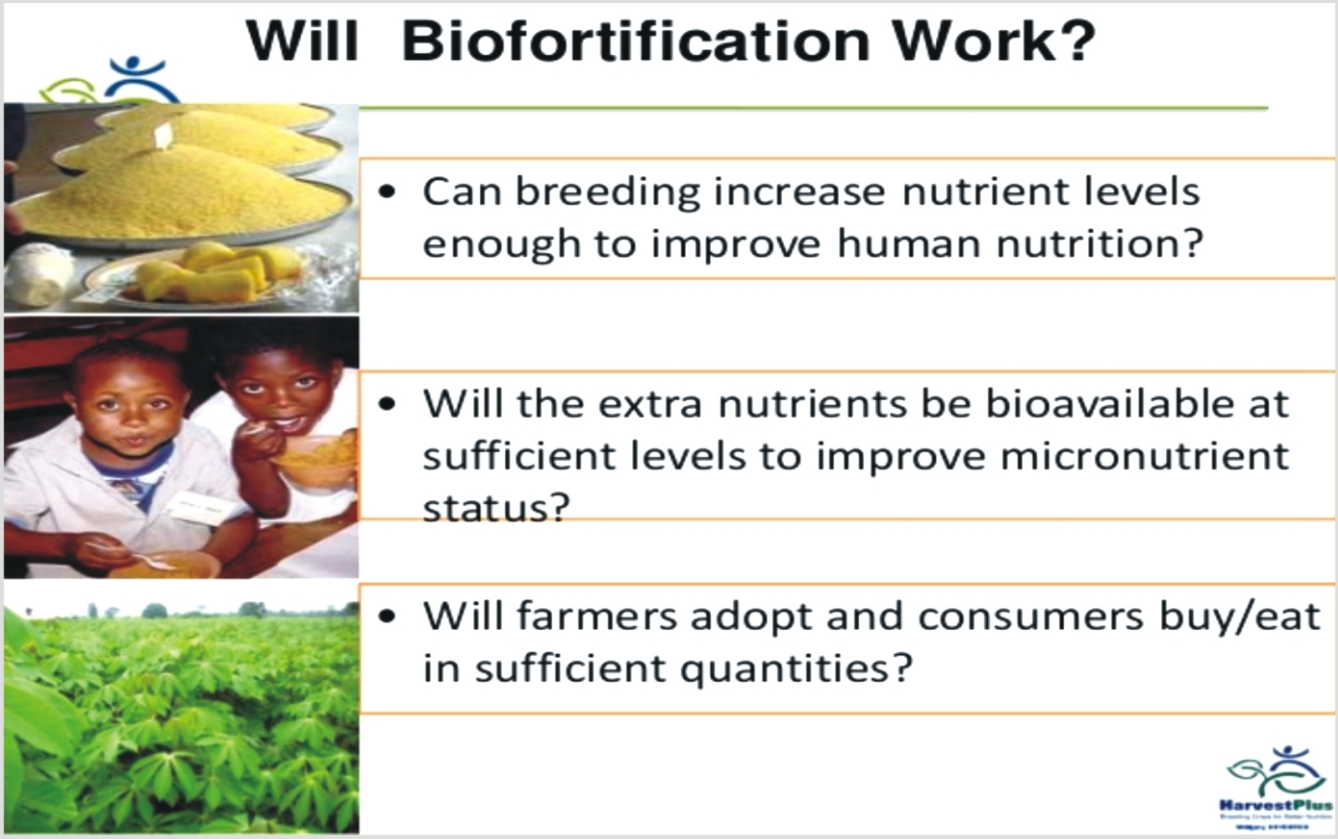


However, the diets of the poor in developing countries, who live mostly in rural areas, consist largely of inexpensive staple foods, such as rice or maize that provide insufficient nutrition. Furthermore, rising food prices have meant that the poor are less able to afford more nutritious foods that could provide them with needed micronutrients. The costs of these deficiencies in terms of lives lost and poor quality of life are staggering (Table 1).

Table 1: Extent and consequences of micronutrient malnutrition

Deficiency	Prevalence in developing countries	Groups most affected	Consequences
Iron	2 billion people	All, but especially women and children	Reduced cognitive ability; childbirth complications; reduced physical capacity and productivity
Vitamin A	250 million children	Children and pregnant women	Increased child and maternal mortality; blindness
Zinc	May be as widespread as iron deficiency	Women and children	Illness from infectious diseases, poor child growth; pregnancy and childbirth complications; reduced birth weight

Source: ACC/SCN 2000.



Biofortification – A New Approach

Biofortification is a promising new strategy to reduce hidden hunger. It is the process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology. First, as a food-based intervention, biofortification uses the very staple foods that the poor are already eating to deliver necessary micronutrients to them. Therefore, biofortified foods are more easily integrated into the livelihoods and diets of the poor. Second, it is an agricultural intervention targeted to rural areas where more than seventy-five percent of the poor in developing countries live, and where access to supplements, fortified foods and other urban-based interventions are limited. Third, a one-time investment in breeding biofortified crops would provide micronutrients far more cost-effectively than through conventional means, which have high annual recurring costs (Table 2). The 2008 Copenhagen Consensus recognized this, listing biofortification as one of its top five solutions to global challenges. Furthermore, once developed, biofortified crops can be adapted to similar agroecological zones, or improved, at relatively low additional cost.

Table 2. How much nutrition a US$75 million investment can buy?

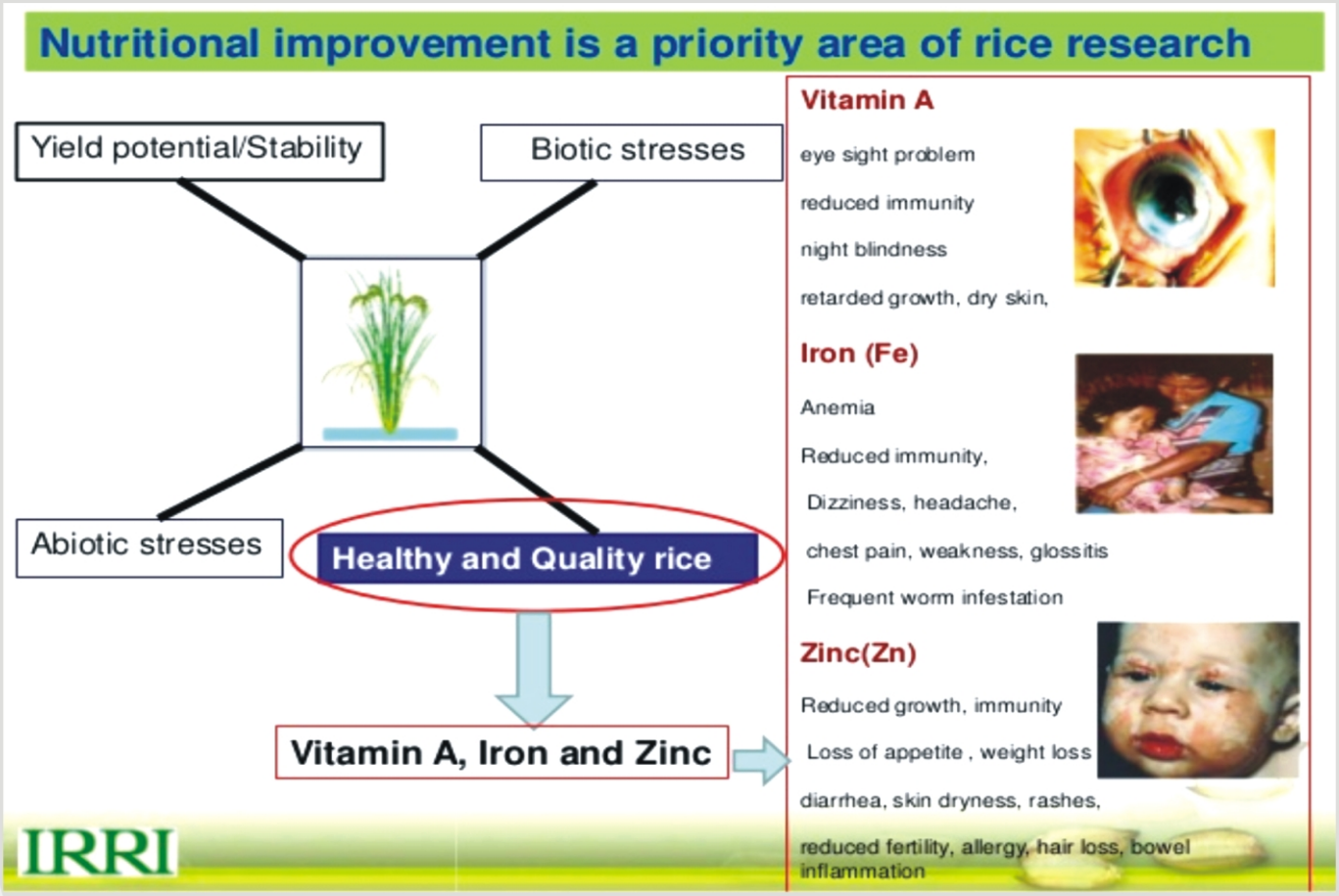
Supplementation	Fortification	Biofortification
Vitamin A supplementation for ONE year only to 37.5 million pre-school children in Bangladesh, India, and Pakistan	Iron fortification for one year for 375 million persons, about 30% of the population in Bangladesh, India, and Pakistan.	Estimated cost of developing and disseminating iron and zinc dense rice and wheat varieties for South Asia, which would be available year after year.

Biofortification of Crops

Biofortification of crops can take place either by adding the appropriate mineral or inorganic compound to fertilizer, by conventional plant breeding, or through the use of biotechnology.

1. Biofortified Rice

Vitamin A deficiency causes eye damage in three million preschool-aged children every year. Of these; half a million become blind and two-thirds will die shortly afterwards. The precursor molecule required for vitamin A biosynthesis, ß-carotene, is absent from the grain of cereals such as rice. Golden rice, named for its golden colour due to its high ß-carotene content, could be used to alleviate Vitamin A deficiency in rice-consuming populations and considered to be the very first genetically engineered crop that was specifically designed to combat malnutrition. The select advantage of a biofortified crop such as Golden Rice is that it could readily reach remote rural populations which have no access to supplementation programs.



2. Biofortified Maize and Cassava

Maize has also been biofortified with ß-carotene as well as other essential micronutrients necessary to maintain one's health. Cassava, the nutritionally deficient staple of a quarter of a billion sub-Saharan Africans has been produced with high levels of ß-carotene and could be used to prevent vitamin A deficiency.

3. Biofortified Wheat

Biofortified wheat provides more options for the proportion of the population who are gluten sensitive or intolerant, and can also provide higher levels of micronutrients, such as iron and zinc, to those in developing countries who use wheat as a staple. Wheat has also been under study as a model crop for zinc biofotification. Zinc (Zn) deficiency ranks as the fifth leading cause of disease in low-income countries, and affects billions of people whose diet is based on cereal grains low in Zn content. Health defects due to zinc deficiency include stunted growth, poor immunity, impairments in mental development and birth complications.

Conclusion

The challenge of hidden hunger requires that agriculture and nutrition disciplines work more closely together to improve human nutrition. This requires building a multidisciplinary research team of scientists from different disciplines. An important component of this is encouraging plant breeders in developing countries to include micronutrients in their breeding portfolios along with higher yield, disease resistance and other agronomic traits. Similarly, nutritionists and public health official must begin to understand the complexities of food as a tool to improve micronutrient malnutrition. It will be far easier to build support for this new strategy among research scientists, health professionals, and policymakers, once biofortification is proven a viable, cost-efficient and effective solution for combating micronutrient malnutrition. HarvestPlus believes that this will be evident by 2012 when the first varieties of biofortified crops are released in target developing countries. In short, biofortification may well prove to be a sustainable long-term approach for providing millions of poor people in developing countries with at least a part of their micronutrient requirements. As a component of a strategy that includes dietary diversification, supplementation and commercial fortification significant progress could be made in reducing hidden hunger globally.

Ms. Shikha Khandelwal is Assistant Professor in Amity Institute of Biotechnology, Amity University- Haryana, Gurgaon (Manesar).

CENVAT CREDIT TO MANUFACTURER ON INPUTS – COMMON ISSUES

By :
CA Ashish Chaudhary

Introduction

The Cenvat credit scheme is a beneficial scheme the intention of which is to allow the manufacturer of dutiable goods as well as the provider of taxable services to avail eligible credit. In this article the paper writer examines the eligibility to credit on inputs to a manufacturer of final products.

CENVAT credit rules have unified the credit available on goods and services. With effect from 10.09.2004 the scope had been enlarged by amending the CENVAT credit rules whereby inter-sector set off of credit are allowed to both manufacturers and service providers.

The total credit available for set off against the excise duty payable to the manufacturer would be to the extent of credit availed on inputs, input services and capital goods. Thus reducing the net outflow of excise duty for the manufacturer.

Cenvat credit on inputs

The term input is defined in Rule 2(k) of CCR:

"input" means

(i) all goods used in the factory by the manufacturer of the final product; or

(ii) any goods including accessories, cleared along with the final product, the value of which is included in the value of the final product and goods used for providing free warranty for final products; or

(iii) all goods used for generation of electricity or steam for captive use; or

(iv) all goods used for providing any output service;

but excludes -

(A) light diesel oil, high speed diesel oil or motor spirit, commonly known as petrol;

(B) any goods used for -

a. construction or execution of works contract of a building or a civil structure or a part thereof; or

b. laying of foundation or making of structures for support of capital goods, except for the provision of service portion in the execution of a works or construction service as listed under clause (b) of section 66E of the Act;

(C) capital goods except when used as parts or components in the manufacture of a final product;

(D) motor vehicles;

(E) any goods, such as food items, goods used in a guesthouse, residential colony, club or a recreation facility and clinical establishment, when such goods are used primarily for personal use or consumption of any employee; and

(F) any goods which have no relationship whatsoever with the manufacture of a final product.

Explanation : For the purpose of this clause, "free warranty" means a warranty provided by the manufacturer, the value of which is included in the price of the final product and is not charged separately from the customer;]

Issue : Whether credit can be availed on the inputs sent to site and fitted on systems being excisable goods and excise duty paid on the entire price?

Comment : Yes, when the inputs are directly sent to site and fixed on the systems manufactured at site and excise duty is paid on these systems. The credit related to same could be availed. It is advisable to intimate the range by RPAD letter and seek confirmation of understanding on eligibility to such credits.

Issue : Whether credit can be availed on inputs used for testing?

Comments : Yes, it can be availed as testing is linked to the manufacturing process and until the testing is done the manufacturing process is incomplete, as goods cannot be sold and are not marketable.

Issue : Whether the credit can be availed on the gloves and uniforms of the workmen?

Comments : Yes, the credit can be availed as the gloves and uniforms are used in factory during manufacture of final product. For example gloves could be used to handle acids in the factory of manufacture of final product.

Issue : Whether goods are required to be present physically in the final product to avail credit?

Comments : No, the physical presence of inputs in final products is not necessary to claim credit.

Issue : Whether credit can be availed on furniture stationary used in office within factory?

Comments : The goods such as furniture and stationary used in office within factory are goods used in relation to manufacturing and credit related to same could be eligible. This was also clarified in circular no. 943/4/2011-CX., dated 29-4-2011.

Issue : Whether credit can be availed on the inputs lost during manufacturing process?

Comments : Yes, credit is available on the entire quantity of input, even if part of input goes in process loss.

Issue : Whether credit can be allowed on short received inputs?

Comments : No as the inputs cannot be said to be received and used in manufacture of excisable goods.

Issue : Whether credit can be availed on inputs being materials used for Research & Development?

Comment : Maybe, credit could be availed on materials used for R&D. The credit may be denied on the premise that there is no relationship to final product which is not in existence.

Issue : Whether there is need to reverse credit when there is destruction of Inputs by Fire / any other mode?

Comments : If the inputs are damaged during production, the credit is available.

Issue : Whether the credit can be availed on structural components?

Comments : There is a restriction on availment of cenvat credit on the structural components which are used for foundation or making structure for support of capital goods. Structural components which are essential parts of machinery/equipment could be eligible.

Issue : Whether credit is required to be reversed for write off of the inputs partly/wholly?

Comment : Yes. However, if subsequently used in the manufacture of final products, the manufacturer can avail re credit.

Issue : Whether credit availed on inputs need to be reversed when subsequently product is exempted from excise duty?

Comments : No there is no need to reverse credit. In CCE v Suvera Processed Foods Pvt Ltd (2015 (315) ELT 517), the Andhra Pradesh High Court held that CENVAT credit availed on inputs was not required to be reversed when the final product was exempted at a later date.

Issue : Whether inputs can be stored outside factory?

Comments : Yes, if the manufacturer is unable to store the inputs inside the factory for want of space, hazardous nature of goods. Then can store the inputs outside premises. The permission from the Asst/ Dty Commr is necessary.

Issue : Whether credit can be availed on invoice when the buyer and Consignee are different?

Comments : Yes it can be availed by consignee even though invoice is in name of the buyer. As long as the goods are used by consignee in the manufacture of dutiable final goods, the eligible credit can be availed.

Issue : Whether there is any time limit for availing credit on inputs?

Comments : Yes wef 1.9.14 the credit is to be availed on inputs and input services within 6 months of invoice date. W.e.f. 1.3.15, credit on inputs and input services is to be availed within 1 year of invoice date. In case of past demand this may not apply and this rule could be challenged.

Issue : Whether credit is available on Commercial Invoice when backed up by a duty paying dealers documents in dealer's name?

Comment : It is possible as per the decision in Darshan Industries 2014 (307) E.L.T. 36 (Guj.) rendered by Gujarat High Court.

Issue : Whether credit can be availed on inputs sent directly sent to job worker premises?

Comments : Rule 4 of CCR 2004 has been amended by Budget 2015 to provide for Cenvat credit in respect of receipt of inputs directly by job worker when such goods are sent directly on direction of manufacturer or the provider of output service. Earlier credit was available only on receipt of processed goods.

Conclusion

The paper writer has attempted to discuss certain issues on availment of credit. It is expected that the discussion would dispel doubts among manufacturers regarding certain common issues as to availment of credit on inputs and the same could be claimed.

Mr. Ashish Chaudhary is chartered accountant, practicing in Indirect Taxation at Gurgaon and could be reached at ashish@hiregange.com

VAASTU SHASTRA

By :
Roopali Raj

Vaastu shastra is ancient science of living of higher dimension. Vaastu Shastra aims at ensuring health, happiness and prosperity and well being of human being with a peace and tranquility of mind .Many factors governs or rules the life of human being like his karma, fate and surroundings. One cannot say that vaastu can change your destiny but it makes your life more comfortable. The whole universe is a composition of five basic elements, fire, air, sky, earth and water. Through these our body receives internal energies in form of Proteins, fats, etc, and external energies in form of heat, light, sound and so on.

The basic principle of vaastu enables us to achieve or balance among these; giving more flexibility of body and mind for a better life. When the harmony between these elements gets disturbed our energies get dissipated in different directions leading to stress, tension and ill health and our peace of mind is destroyed. We then have to redirect our energies subjectively as well as objectively, as to achieve balance between internal and external energies, to attain healthy body and happy mind leading health wealth and happiness.

FACTORIES :-

1. Blocking of north east (ishan) portion of the house or industry restricts the inflow of blessings of god. It leads to tension, quarrel and insufficient growth of the inhabitants especially children of the owner.
2. Finished products are to be kept in the North West corner. It would help quick movements of the stock and early recovery thereof.
3. Keep all electrical/heat generating appliances in the south east or eastern area of the room.
4. In the south west corner, scrap and other heavy items can be dumped in factories.
5. Heavy machinery should be installed in the south and lighter in the north side.
6. The best place for underground water tanks should be in north east corner of the plot.
7. The overhead water tanks should be in the South West or North West.
8. Main entrance should be in the east or north it should never be in the south west.
9. Factory premises should be square or rectangle (1:2) proportion is preferably the northwest and south west corners should be at 90 degree. Numerology/vaastu.

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DILEMMA OF DISCOLOURATION : VITILIGO

By

Chitralekha Rana

WHAT IS VITILIGO

Vitiligo, also known as leucoderma, is a pigmentation disorder in which melanocytes (the cells that make pigment) in the skin is destroyed. As a result, white patches appear on the skin in different parts of the body. Similar patches also appear on both the mucous membranes (tissues that line the inside of the mouth and nose) and the retina (inner layer of the eyeball). The hair that grows on areas affected by vitiligo sometimes turns white.

WHO IS AFFECTED BY VITILIGO?

About 0.5 to 1 percent of the world's population, or as many as 65 million people, have vitiligo. In the United States, 1 to 2 million people have the disorder. Half the people who have vitiligo develop it before age 20; most develop it before their 40th birthday. The disorder affects both sexes and all races equally; however, it is more noticeable in people with dark skin.

CAUSE

The cause of vitiligo is not known, but doctors and researchers suggest that it may arise from autoimmune, genetic, oxidative stress, neural, or viral causes. There is strong evidence that people with vitiligo inherit a group of three genes that make them susceptible to depigmentation. The most widely accepted view is that the depigmentation occurs because vitiligo is an autoimmune disease -- a disease in which a person's immune system reacts against the body's own organs or tissues. People's bodies produce proteins called cytokines that, in vitiligo, alter their pigment-producing cells and cause these cells to die. Another theory is that melanocytes destroy themselves. Finally, some people have reported that a single event such as sunburn or emotional distress triggered vitiligo; however, these events have not been scientifically proven as causes of vitiligo.

SIGNS AND SYMPTOMS

People who develop vitiligo usually first notice white patches (depigmentation) on their skin. Although pathches are small, they often enlarge and change shape. These patches are more commonly found on sun-exposed areas of the body, including the hands, feet, arms, face, and lips. Other common areas for white patches to appear are the armpits and groin, and around the mouth, eyes, nostrils, navel, genitals, and rectum.

Vitiligo generally appears in one of three patterns:

- Focal pattern -- depigmentation limited to one or only a few areas
- Segmental pattern -- depigmented patches that develop on one side of the body
- Generalized pattern -- the most common pattern. Depigmentation occurs symmetrically on both sides of the body.

THERAPY

The primary goal of therapy is to restore the skin's color by restoring melanocytes in the skin. Repigmentation of the skin with melanocytes allows the skin to regain its normal immune/inflammatory functions and improves the appearance of those suffering from this disease.There are a number of treatments for vitiligo. Treatment options generally fall into four groups:

- UVB phototherapy: Exposing the skin to UVB light from UVB lamps is the most common treatment for vitiligo. Adding a psoralen, a photosensitizer that increases the effect of the UV light, can aid in partial repigmentation. Studies have shown that immunomodulator creams such as Protopic and Elidel also cause repigmentation in some cases, when used with UVB treatments. There is no treatment that totally repigments the skin.
- PUVA phototherapy: A light (PUVA) treatment involves taking a drug which increases the skin's sensitivity to ultraviolet light. The skin is then exposed to high doses of ultraviolet A light. Because of the high doses of UVA and psoralen, PUVA may cause side effects such as sunburn-type reactions or skin freckling.
- Skin camouflage: In mild cases, vitiligo patches can be hidden with makeup or other cosmetic camouflage solutions. If the affected person is pale-skinned, the patches can be made less visible by avoiding both sunlight and the tanning of unaffected skin.

MEDICAL

Several methods of treatment with varying success rates are currently in use. Some doctors prescribe topical medications and/or ointments with or without corticosteriods. A treatment frequently used is the application or ingestion of a drug (psoralens) followed by exposure to ultra-violet light (sun light). This combined treatment is known as PUVA or PUVB. It is reported that these treatments result in limited success (only 61% of patients achieve more than 25% repigmentation). Even in patients who have a good response to medical treatment methods, the hands, fingers, feet, and ankles and penis frequently do not repigment.

SURGICAL

You should consider the surgical treatment of vitiligo only if:

- Your vitiligo has not changed in the last year.
- You are not responding to PUVA or PUVB treatment.
- Your skin has never permanently lost its color (pigment) when you have suffered a small cut or scrape.
- You do not have Hepatitis C or AIDS.

Surgical treatment is ideal for those that have Segmental Vitiligo.

Ms. Chitralekha Rana is a Student, BTech (Biotechnology), Amity Institute of Biotechnology at Amity University Haryana, Gurgaon (Manesar).

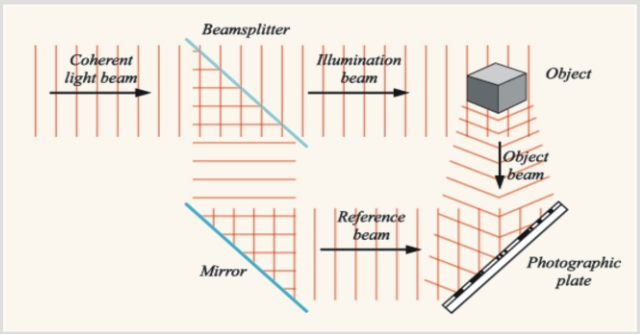
HOLOGRAPHY

BY
DR. RAM K SHARMA

In conventional photography, the camera focuses the light reflected from an illuminated three dimensional object on a photographic plate forming a two dimensional image. This image can be seen by illuminating the photographic plate by ordinary light. However, it records only the intensity changes on the plate and gives no information about the phase. This limits a three dimensional object to a two dimensional image.

Gabor (1947) developed a new technique that allows the light scattered from an object to be recorded and later reconstructed in such a manner that it appears as if the object were still present. The image changes as the position and orientation of the viewing system is changed making the recorded image appear three-dimensional. This technique is known as **Holography** (Greek; holos: whole, graphy: writing). **Gabor** received the Nobel Prize in Physics in 1971 for this discovery.

The above figure shows the holographic recording process. Part of the light scattered from an object falls on the recording medium. A second light beam, the reference beam, also illuminates the recording medium. The resulting light field generates a varying intensity



pattern due to interference between the two waves, which is recorded in the hologram. If the hologram is illuminated by the original reference beam, the diffraction by the hologram would produce a light field which would be identical to the light field which was scattered by the object. Thus, a hologram is not an image but an encoding system which enables the scattered light field to be reconstructed.

Since each point in the hologram contains light from the whole of the original scene, the whole scene can be reconstructed from an arbitrarily small part of the hologram, however the resolution becomes poorer as the size of the hologram is decreased.

The technique of holography is quite extensively used in the fields of data storage, security, art, engineering, microscopy and optical imaging, sensors, image processing etc.

Holographic data storage can store information at high density as the holographic storage uses the volume of the recording media instead of just the surface. This can result in about one-gigabit-per-second writing speed and read speeds of one-terabit-per-second, quite higher than the existing ones.

Security holograms are very difficult to forge and are widely used in many currencies e.g. British Pound, Canadian dollar, Euro; credit and bank cards, passports, ID cards, books, DVDs, sports equipment etc.

The hologram can be used for sensing purposes also if it is made of a material which, by interacting with certain molecules, generates a change in the fringe periodicity or refractive index changing the color of the holographic reflection.

Certain holographic materials do not need the developing process and can record a hologram in a very short time. This allows holography to perform operations in an all-optical way. Such real-time holograms are used in optical cache memories, image processing and optical computing.

Holographic Interferometry (HI) is a technique that enables measurement of displacements of objects with respect to optically rough surfaces and has been widely used to measure stress, strain, and vibration in engineering structures.

Optical phase conjugation technique allows the removal of the wavefront distortions produced in a light beam when it passes through an aberrating medium by sending it back through the same aberrating medium with a conjugated phase. This is useful in free-space optical communications to compensate for losses caused by atmospheric turbulence.

It is possible to make a hologram for any kind of wave. Therefore, electron holography uses electron waves to improve the resolution and avoid the aberrations in the transmission electron microscopes. Similarly, acoustic holography uses sound waves to improve transportation systems, vehicle and aircraft design.

Besides, holographic scanners are commonly used in post offices, larger shipping firms, and automated conveyor systems to determine the three-dimensional size of a package. They are also used for automation of packaging of given volumes and bulk

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"Teeth In An Hour"

By :
Dr. Yatharth Bhatia

Traditional dental implant procedures take anywhere from three to six months to complete because several months are needed for the implant to fuse with your jawbone. This process is called Osseo integration. As a result, you would have to wait months from the time your implant is inserted before you could experience the full benefits of the procedure. Now, you can get new teeth in an hour. Fortunately, advances in dental implant technology enable the process to be completed much more quickly. Teeth-in-an-Hour, a dental implant innovation created by Nobel Biocare. Teeth-in-an-Hour eliminates the long wait associated with Osseo integration, enabling us to complete your procedure in hours instead of months. The technique involves taking a CAT scan of the jaw and sending to the Nobel Biocare lab for fabrication of surgical stent and teeth. In 2 - 4 weeks the stent is available and then surgery is done and teeth are replaced on the implant in 1 hour.

The whole treatment virtually takes place within an hour from the time patient walks in, and out with a brand new set of teeth in just one hours' time. 3-D computerized advanced dental technology has arrived just in time to meet the wants and needs of patients who are wearing removable complete dentures to lead better and more confident lifestyles. 'Teeth in an Hour' concept wherein the entire implant surgery as well as the final fixed dental prosthesis is preplanned and ready before the surgery by your dentist. The entire treatment is planned by the team at on 3-D computer software and then the treatment plan sent to Nobel bio care via internet where a surgical guide stent is fabricated according to the plan. Conventional implant therapy would involve an invasive surgical phase where the gums are cut and bone exposed to bury the implants and finally with overlying sutures. However with this novel approach non -invasive surgeries are performed through holes in (therefore no sutures) eliminating pain ,swelling and more importantly delivering the final fixed teeth within an hour of the treatment."

Marriage of Necessity, Science and Bioengineering CAD/CAM Applications

The Teeth in an hour concept applies to a variety of edentulous patient demographics. Patients who have a history of compromised bone structures, due to disease, trauma or genetics, may benefit from this unique method of performing dental implant surgery.

Patients who have had implant failures, due to a variety of reasons, can be strong candidates for this procedure that can best assess existing bone structures and existing implants, further paving the way for developing a more intelligent implant mapping that promotes optimal health and longevity of treatment. Still another group that of truly discriminating patients who desire the benefits that only computer based imaging, Cat Scans and virtual implant placement can deliver.

Virtual placement of recommended implants provides patients with the sound and practical information they need for making the best decision possible for maintaining their oral health needs.

Digitized Surgery Guides replaces Freehand Style Surgery

Freehand placement of implant devices, especially with patients who may not have optimal bone structures can result in low rates of predictability for implant success and overall dental function (bite).Virtual placement, accompanied with leading edge Cat Scans all but eliminates guesswork and significantly reduces probabilities for error. Etiological factors that consider how the teeth were lost (trauma, long term extraction history, disease, genetic issues, malformed jaw structures, occlusal characteristics, etc) and the current integrity of bone mass are accounted for in treatment planning.

The treating doctor combines the patient data and Cat Scan analysis which is used to generate a Nobel Guide. A computer guided surgery template that maps the placement of implant devices that are restored individually or used with prosthetic devices (dentures, over dentures, etc).

Advantages

Patient has to sit on the chair for an hour only. But if it is a full mouth case it will take more time.

The advantage of guide is accuracy of implant placement compared to "freehand" implant placement. But this takes away the tactile sensation from the surgeon's hand. As such it is good for inexperienced implantologist only.

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