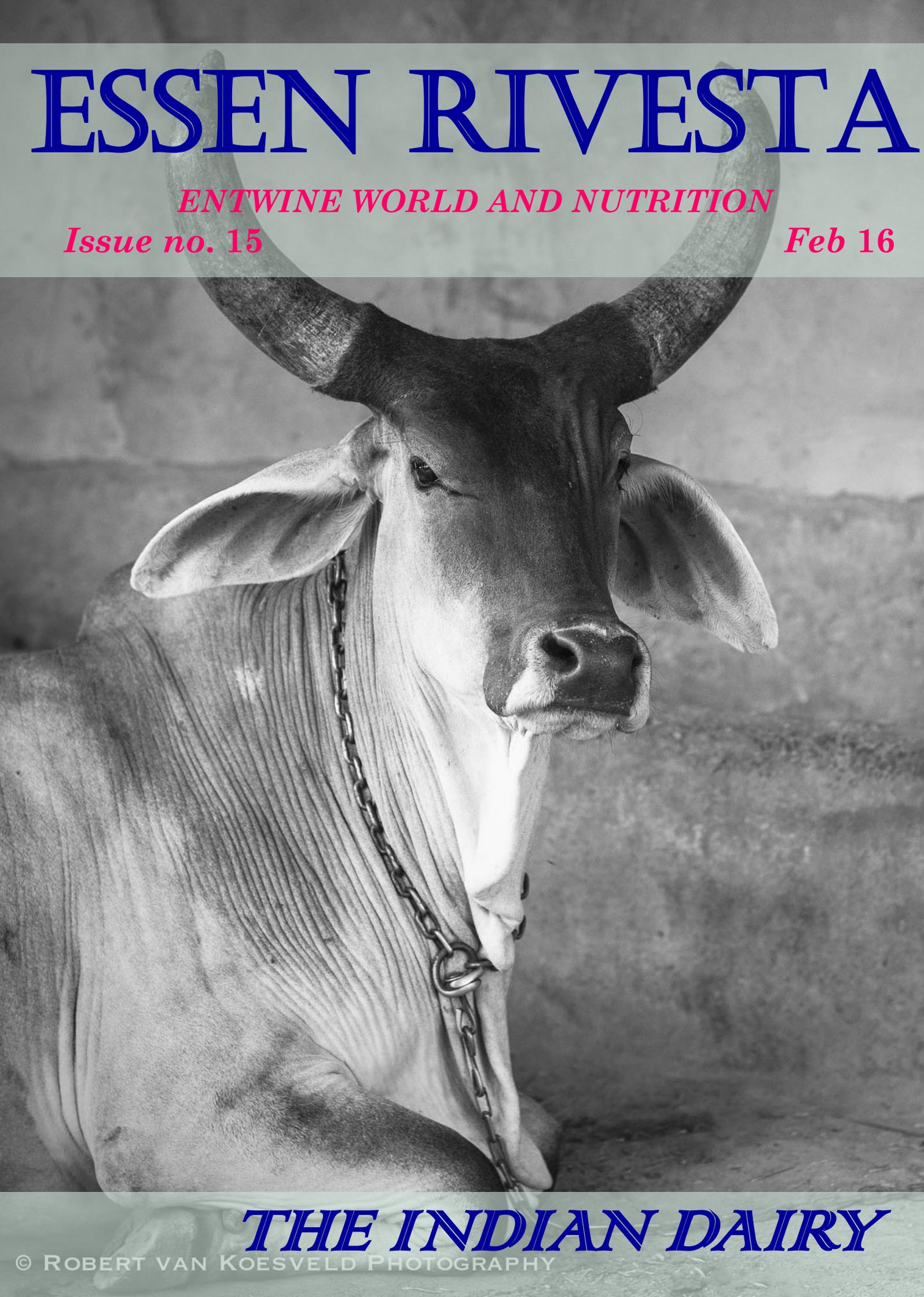


# ESSEN RIVESTA



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*THE INDIAN DAIRY*

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## FROM THE TEAM..

Hello everyone, its good to meet you all through this edition. This edition is based on the theme “The Indian Dairy”, which furnishes on the basic ideology about the Indian scenario and the principle phenomenon about dairy science and engineering. Our team has provided information on various issues that have been up in the media recently and virally like bovine milk, artificial Insemination. We hope you readers will gain much interest in this edition and expect our next edition on dairy. Do send us your feedbacks. We are expecting your write ups and articles.

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YOURS  
The ER team

We have been perceiving an era where India being a dairy treasure. The world's largest producer and also the largest consumer of dairy products witnesses dairy activities in its rural areas. With its largest cattle population it contributes the large share in agricultural gross domestic products. But comparatively milk yield per animal was seemed to be low due to the lack of scientific practices during mulching, inadequate availability of fodder in all seasons and unavailability of veterinary health sciences. Operation flood launched in 1970 led to the modernization of the Indian dairy sector. Dr. Kurien created the network of procurement, processing and distribution of milk by the co-operative sector and increasing the per capita availability of milk. Later the penetration of the milk products which acted as a boost made possibility of expanding the sector wider. The trend of packaging saw it boom and in 1996 tetra packs were introduced in India. Dairy products saw its evolution on a vast scale and several new products still evolve. Product development is a balance wheel in this sector. Some of the traditional milk products include makkhan, ghee, kheer, basundi, rabri, dahi, lassi, channa, khoa, etc. milk production is a relatively efficient way of converting vegetable material into animal food. As value added products offer improved margins, recently the Indian dairy firms are looking at selling milk added protein supplements to cash in on growing awareness among consumers on health benefits. The total milk production has increased from 52.21 MT during 2015-16 (rainy season) to 54.50 MT during 2016-17 (rainy season) registered a growth of 4.38 %. The survey noted that first five highest milk producing states are Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat and Andhra Pradesh. On the other hand based on the estimates by the National dairy Development Board, the demand for milk is likely to reach 180MT by 2022. In the absence of the increased production India will need on the world market for imports which may seem to affect the global prices. Thus liberalization led a number of private companies to drive the wheel. The very important aspect will be the price paid to the farmers. It has been proving that where the dairy farmer organizations are stronger, farmer prices are higher. The quality of milk plays a very important role irrespective of the period. Training and education on clean milk practices and constant monitoring of quality is of prime importance. Though we look the industry as a flourishing sector the complexities to be solved are always emerging.

# THE MARVELLOUS MILKING MACHINE

B. BAVATHARANI, II B.TECH. FPE

We have seen this equipment in many milking parlours, but do we know how it works? This equipment was designed to create a pleasant milking sensation for the cows and to avoid any possible hazard to the udder health. Its design and function is critical for rapid and efficient removal of milk without damage to the teat or gland and with the minimal risk for transmitting pathogenic microorganism that might cause mastitis. The only way for mastitis causing organism to enter inside the teat is through the streak canal. This is the same route where milk is drawn from the gland. Therefore when the streak canal is opened to remove milk, the gland is susceptible to potential intra mammary infection. The machine includes four main parts, the teat cups that contact the cow's teats and remove milk, a claw where milk pools as it is removed from the four teats, vacuum tubes that provide vacuum to the teat cups and a milk tube that removes milk away from the claw, a source of vacuum for the machine, a pulsator that regulates the on-off cycle of the vacuum. Many milking machines now-a-days, have an automatic take-off device that detach the machine from cow when milking process is completed. In addition to it there are machines which are linked to computer system that can both regulate and generate data about the cow and its milk as milking is occurring. Milking is done by two phases- milk phase and rest phase. During milk phase vacuum is applied to the inner thin wall of the teat cups which draws milk from the gland. In rest phase the vacuum inside the chamber of the teat cup is monetarily off. Air enters this chamber which helps in massaging the teats and maintains the blood flow. This alternating vacuum and atmospheric pressure is controlled by pulsator. If constant vacuum is applied to the teat end for a long period blood and lymph will accumulate in the end of the teat causing trauma to the teat. To prevent this alternating vacuum and atmosphere pressure called pulsation is important. After the milk leaves the teat it flows to the collecting bowl of the claw. The milk is then drawn from the claw, through milk hose to the milk line by the same vacuum. The milk in the milk line flows to a pump that pumps milk to the milking tank usually placed in separate room from where milking is occurring milk yield can be determined by a milk flow meter. It is important that milking should be done with well cleaned and properly maintained environment. A skilled operator is necessary for the attachment and removal of teat cups from the udder. Compared to hand milking machine milking is a perfect equipment for drawing milk from the cow without causing any diseases to animals as well as human.

## **Conclusion:-**

These are the various design considerations of the milking machine and in the modern world the necessity of the automation in each and every field become vast, so in order to meet this in the dairy sector the perfect and the good quality milking machine may facilitate the milking process and improve the quality of the milk also.

# BOVINE MILK

S. RADIKA AND E. RAMBA, III B.TECH. FPE



Bovine growth hormone, or bovine somatotropin (also called BGH, rBGH, BST), is a synthetic and peptide hormone given to cows to make them mature faster and produce more milk. The hormone is produced by cow's pituitary gland and an extra amino acid is attached before it's injected into dairy cows.

The US was first introducing the hormone in 1993. From 2000-2005, the USDA National Agricultural Statistics Service survey of dairy producers found that about 17% of producers used rBST. recombinant DNA technology is used to synthesize the hormones like recombinant bovine somatotropin (rBST), recombinant bovine growth hormone (rBGH), or artificial growth hormone. Four large pharmaceutical companies, Monsanto, American Cyanamid, Eli Lilly, and Upjohn, developed commercial rBST products.

Bovine growth hormone occurs naturally in cows, the same way human growth hormone occurs naturally in humans. To make it more effective synthetic hormone is introduced. Only one amino acid differentiates (chemically), produced naturally by a cow and the synthetic form. Each of these forms of hormone stimulates production of cow's milk. This increase and decrease in milk production is partially caused by the count of milk-producing cells in the udder. These hormones will slow the rate at which the number of mammary cells decreases, and increases the amount of nutrients which leads to an extension of peak milk production. But the overall composition of the milk including the fat, protein, and lactose content are not altered by the use of rBST in dairy cows.

## Challenges :

Milk from cows treated with rBGH contains higher levels of IGF-1 which contributes to tumour development, specifically breast, prostate and colorectal cancers. It appears when IGFs interacts with estrogens Cows injected with rBGH are more likely to develop mastitis, an inflammation and infection of mammary tissue, foot disorders and some reproductive problems.

If cows are injected with bovine growth hormone, it may cause them to produce more of another hormone called insulin-like growth factor-1 (IGF-1). Animal studies suggest that elevated levels of IGF-1 in the bloodstream could increase the risk for some cancers, particularly colon and breast cancers. High level consumption of IGF results genetically modified cows. So it is our responsibility to find an alternative method for glut mik production to meet our per capita consumption.

# ARTIFICIAL INSEMINATION: BOON OR BANE

Pujitha Suba Varshinee  
III B.Tech. FPE

Ever since jalikattu protest, we can see all the people talking about “artificial insemination” and its bad effect and all. Now let us know what it means, when and how it started, why it is needed and decide for ourselves whether it is a boon or a bane. For starters, artificial insemination is the technique in which semen with living sperms is collected from the male and introduced into female reproductive tract at proper time with the help of instruments. This has been found to result in a normal offspring. AI was done for the first time in India in 1939 by Sampat Kumaran at ‘Palace Dairy Farm Mysore’. He inseminated large number of Halliker cows with semen of Holstein Friesian and got 33 cows pregnant. The first buffalo calf through AI was born at the Allahabad Agricultural Institute in 1943. AI is very powerful and useful technique for increasing the productivity of indigenous animals and its use in judicious and efficient manner is necessary for the well-being of the poor farmers in our country. The dairy industry has benefited greatly by the use of artificial insemination, not because AI is a panacea that works like magic, but because of the very rigorous selection of the bulls that are used before they are allowed into the AI lineup. National increases in milk production per cow is directly associated with the use of artificial insemination in dairy herds. Hence it is clear that artificial insemination came to India to meet our demands. Now let us see why people are now protesting against it. It all began with the knowledge of A1 and A2 milk. The controversy is that one group of scientists claim BCM [ $\beta$ -casomprohin, a decapeptide produced by hydrolysis of A1 milk] a cause of many health problems like heart disease, diabetes and other diseases in human whereas other groups report beneficial effects of BCM like it might have protective role and prevent kidney complications in diabetes patients and declare both types of milk safe for children and adults. While there is not enough credible evidence of A1 milk causing health problems, people have started to protest against artificial insemination to support the growth of Indian breeds of cow which have been found to produce pure A2 milk. But in order to meet our demands, milk yield of our cows will not be sufficient. To some extent it is true that if our lot of cows if fed and managed properly, milk production can be increased by 15-20%, but the cost of feeding and revenue from milk output would not match. On today’s cost unless a cow yields 2500 kg milk in a year its’ rearing would not be profitable to the farmer. Brazil in a span of 25 years have developed excellent purebred Indian cows (Gir and Kankrej) by employing scientific principles of breeding. India too can achieve this provided we allow scientific breeding by farmers which essentially includes selection of good animals and culling or disposal of inferior animals.

In my opinion before protesting against artificial insemination, we need to attain self-sustainability with our Indian breeds to meet our demand. Instead of considering AI as a boon or a bane, I would think of it as a redeemer in the present scenario.

**SOURCE:** Agri portal

## MARCHING OF NEW PRESERVATIVES FOR SAFER MEAT

Arjuna Natural Extracts Ltd said it is coming out with X-tend, a complete, natural, formulation-specific preservative that will increase chilled-meat product shelf-life and better ensure food safety. Synthetic preservatives used in chilled meats commonly contain nitrates, which can bring about nitrosamines, chemical compounds that allegedly can increase cancer risk. The all-natural X-tend formulation can be used instead. X-tend is designed to be highly potent and prevents the growth of yeast and mold in chilled meat products.

Arjuna Natural Extracts' all-natural X-tend formula can replace chemical nitrosomyoglobin-forming preservatives, yet is non-carcinogenic and safe to use in chilled meat, eliminating some of the problems of storing meat. With the X-tend product, getting the taste and correct mouthfeel isn't perfected, but further experimentation with flavor masking should help improve this innovation.



## BUDGET 2017

Though not a "big game changer", but Budget 2017 will spur the farm and allied sector even as they urged for better implementation of schemes. Agri-industry and farm experts welcomed the Budget for 2017-18.

But the Edible oil industry body SEA, expressed disappointment that the government did not change import duty on edible oils. Edible oil industry body SEA President Atul Chaturvedi said, "Finance Minister has chosen not to change the import duty on edible oil and decided to maintain the status quo. This will discourage farmers to continue to grow oilseeds and may switch over to other crops and our dependence on imports of vegetable oil will further increase." It is also good to see that the government is focusing on water. The separate funds to focus on irrigation show commitment to water.



# UPDATES

K.LAVANYA, III B.TECH. FPE

The government has not announced much to boost food processing except for creating separate fund for dairy sector, and it also did not announce any step to "change the big monster of food and fertiliser subsidy. There was no mention, not a word on fund allocation to encourage farm mechanization, food processing and steps to curb food and fertiliser subsidies.

The dairy processing infra fund of Rs 8,000 crore is a positive step for the sector, however, government needs to take a holistic view and develop a policy framework to support both cooperatives and private dairy companies. The fund should also be structured to provide support for entrepreneurial dairy companies in the form of cost efficient patient debt for setting up additional processing capacity and capitalising dairy supply chain infrastructure.

## CSIR TO PRESERVE SUGARCANE JUICE

Council for Scientific and Industrial Research (CSIR) has come up with a technology that can help preserve sugarcane juice for 3-5 months, perhaps it could be commercially used as a beverage. India is one of the leading producers of sugarcane in the world. Sugarcane juice has low glycaemic index due to the presence of complex sugars and hence it is also good for even diabetic population. However, its consumption is limited to roadside crushers and only in a specific season, a senior CSIR scientist said.

Director of Lucknow-based CSIR-Indian Institute of Toxicology Research (IITR), Alok Dhawan said the presence of bacteria and yeast in the sugarcane juice causes quick fermentation, making it unfit to compete in the massive Indian beverage market. It was the industry that first approached the IITR to come up with such a technology to optimise the yield. "By making sugarcane juice fit for consumption for three to five months from the date of manufacture, given its popularity to beat the heat, it is expected to become multi-crore industry, directly benefitting the farmers," Dhawan added. Bacteria is a major culprit that leads to fermentation of sugarcane juice when it is extracted. "We treat the sugarcane with very light electricity current and this helps in killing the bacteria. The long-

## ERP FOR FOOD INDUSTRY

LOGANAYAKI, III B.TECH. FPE

For a country with a vast population and growing needs, the food industry in India shoulder a major responsibility of fulfilling one of the basic needs for survivals well as enhancing economy with its natural and packaged food products. A general Food industry consists of producing and growing food products, processing and packaging them, and finally distribution, which has become a tedious task with growing demands. A software which is existence in food industry is ERP software packages. For ex.Sage ERP, a partly cloud based ERP software is smartly designed business management tool that can proficiently take over the complex task, minimalize wastage and provide better ROI. The languages involved in ERP packages are SQL,C,C++,python, PHP, JAVA. The different software packages of ERP are free and open source software, proprietary software.

Key functional capabilities, data model characteristics, and enabling technologies of ERP in food industry are Accountability and management of ingredients, raw materials, and finished products, including co-products and by-products, the ability to predict yields, scale production, cost products, and perform product recalls, the effect of variable product characteristics and inventory attributes, including multiple units of measure (UOM) and shelf life, on various ERP functions, the impact of the ERP data model on the application's functionality and maintenance.

### Process Manufacturing ERP Checklist

- Improving production through recipe/formula management
- Improving product costing
- Managing multiple units of measure simultaneously
- Managing the variable characteristics of products
- Meeting regulatory compliance and accelerating product recalls through lot traceability
- Reducing inventory write-offs with expiration date management

### Benefits:

ERP can improve quality and efficiency of the business. It supports upper level management by providing information for decision making. It can improve data security. ERP provides increased opportunities for collaboration.

ERP software for food industry is the ultimate support system, which can help the industry to grow, and climb the success ladder swiftly and seamlessly. From production to distribution, ERP can provide its well analysed and data backed assistance to help Food Industry.ERP software packages are need to be updated periodically to improve the efficiency of existing technologies in the software.

LEARN NEW

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