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 foodtech insider

— INTRO

All about staying ahead of the food curve

Foodtech Insider, a periodical publication dedicated to showcasing the latest trends, advancements, and breakthroughs in the dynamic food technology sector. As a platform tailored for industry professionals, investors, and enthusiasts, we provide valuable insights into the ever-evolving landscape of the Food & Beverage industry, both locally in India and on a global scale.

Embark on a journey through the realm of food technology with Foodtech Insider, your go-to online destination for all things foodtech. Discover innovations and transformative breakthroughs that are shaping the future of the F&B industry. Whether you are a seasoned industry expert, an investor seeking valuable insights, or simply passionate about the evolution of food, our platform is designed to keep you informed and inspired with the latest industry trends.





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The Rise of Food as a Wellness Category: Trends Shaping Our Plates

Consumer attitudes, priorities, and behaviours are undergoing a dramatic shift, particularly in the realm of food and wellness. Ana Ferrell, VP of Marketing at ADM, highlights this evolution as a golden opportunity for innovative food and beverage companies to create groundbreaking products aligned with changing consumer demands. ADM's research reveals that a substantial 77% of consumers are committed to healthier lifestyles. This trend underscores the critical need for manufacturers to balance health with affordability to cultivate consumer loyalty.

The Intersection of Food and Wellness - The growing awareness of the connection between diet and overall health has led to a surge in demand for wellness-oriented food products. As consumers become more conscious of their health, they are increasingly seeking foods that not only satisfy their hunger but also contribute to their well-being. ADM has identified six key behavioural shifts that are reshaping the food and beverage landscape-

- **Gut Health and Immunity** : The COVID-19 pandemic amplified consumer concern about immune function. As a result, there's a surge in demand for products containing probiotics, prebiotics, and postbiotics to support gut health and overall well-being.
- **Plant-Based Dominance** : The adoption of plant-based alternatives has accelerated, driven by health, ethical, and environmental considerations. Products that deliver exceptional taste and nutritional value are poised to capture market share.
- **Weight Management and Metabolic Health** : Increased awareness of chronic diseases has prompted a focus on weight management and metabolic health. Consumers seek functional solutions to support these goals.
- **Balancing Indulgence and Wellness** : The pandemic-induced stress has led to a desire for both comfort food and nutritional balance. Products that cater to this duality are gaining traction.
- **Personalized Nutrition** : The recognition of individual health needs has spurred demand for tailored nutritional solutions. Consumers seek products that align with their specific dietary goals and preferences.
- **Value-Conscious Wellness** : Economic factors have influenced purchasing behavior, driving a demand for affordable, yet healthy options. Private labels and value retailers are benefiting from this trend.



The Growing Food as Wellness Category - The intersection of food and wellness is becoming increasingly prominent, as consumers recognize the impact of their dietary choices on their overall health. This trend has driven demand for a diverse array of products that cater to various health and wellness needs. The key product categories are:-

- **Naturally Healthy & Organic** : This category encompasses minimally processed foods made from natural ingredients. These products appeal to consumers seeking wholesome nutrition without synthetic additives.
- **Functional Foods** : These foods are designed to provide health benefits beyond basic nutrition. They are often fortified with essential nutrients and formulated to be allergen-free, catering to health-conscious consumers. These behavioural shifts have fueled the growth of functional foods and beverages. Products fortified with vitamins, minerals, and other beneficial compounds are increasingly sought after. The blurring lines between food and supplements creates exciting opportunities for innovation.
- **Plant-Based Alternatives** : The rise of plant-based diets has led to a surge in products derived from plants, including dairy and meat alternatives. These offerings provide sustainable, ethical options that align with consumers' health and environmental concerns.

Retailers are responding to this trend by expanding their health and wellness offerings. In-store initiatives, such as dietitian consultations and educational programs, enhance the shopping experience. Simultaneously, the rise of e-commerce has made it easier for consumers to access a wide range of health-focused products. While the food and wellness category present immense potential, industry players face challenges such as consumer education, product development, and regulatory compliance. However, by focusing on product innovation, consumer education, and sustainable practices, companies can position themselves for long-term success in this promising category.

— Packaging for Brand Recognition: The Silent Salesman

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Over the years, packaging has evolved to a new level of identity, offering far more than its primary functions. Let's delve into how packaging assists with brand recognition in today's ever-expanding packaging world. It plays a pivotal role in developing, building, and enhancing product presentation, thereby increasing the perceived value of products and services.

For a variety of reasons, the purpose and scope of the package have widened greatly today. There is a tremendous growth in supermarket and self-service stores. Great advances have also been made in the sales and marketing of different goods through innovative packaging designs. Owing to these new factors, packaging has progressed far beyond its original job of storing and preserving the contents and has taken on several important new functions.

Gradually, product packaging has acquired almost magical powers to influence brand recognition. It has become a subtle persuader and silent salesman on supermarket and mall shelves, enticing, informing, and delivering a concise sales message to indecisive customers. Hence, the adage, "A well-packaged item is only half sold; a well-packed and designed package is fully sold." As an advertising medium, packaging excels because its impact occurs at the point of sale when potential customers, with wallets in hand, contemplate choices among competing products. A superior package can sway customer decisions in favour of one product over another, serving as a crucial factor in brand identity and enhancement.

Compared to other forms of brand identity and advertising, a well-designed package offers exceptional value for the investment. Its advertising impact extends beyond the point of purchase. Carried through streets or on public transport, effective packaging design advertises to a wider audience. Continuing the equation for a good product packaging design -The package is before our eyes and those of our visitors most of the time-at the breakfast table, the kitchen shelf or the office cupboard. Sometimes, its life extends beyond product consumption as a reusable container. A well-designed package or container will naturally compel the attention of a potential customer all through this period -from the sales counter at the supermarket to a much longer period after the contents are exhausted.

It is for these reasons that the package design has resumed a greater significance in recent times and has acquired a new meaning and has become a major factor in the success of a pack product in the context of powerful competition among consumer goods through supermarkets, the package design place a very vital role in the packages design and can no longer be considered in isolation. It is a factor in public relation as well as direct selling- it in all and knowledge of psychology as well as design shape it conveys the character and desirability of the goods that the package contains and usually conceals that there is a growing trendy or companies to regard their package design as a contribution to much larger objective than the establishment of a corporate identity for the whole enterprise. In conclusion, effective packaging design drives brand recognition and sales, acting as a silent salesman. The era of packaging as a secondary consideration is over. Today, it demands research, development, and innovation to create impactful designs.

Lactose-Free Milk: A Growing Trend in Health-Conscious Consumerism

Consumers are increasingly aware of lactose intolerance, a digestive condition that affects many individuals and can lead to discomfort when consuming dairy products. As a result, there is a growing demand for lactose-free milk and dairy products globally, driven by a heightened focus on gut health and overall well-being. This shift in consumer preferences has prompted the dairy industry to innovate and expand its offerings to include a variety of lactose-free options.

Production Processes - To cater to the increasing demand for lactose-free products, dairy manufacturers employ various production processes. Currently, two primary methods are used: the batch process and the aseptic process, both of which utilize the enzyme lactase to break down lactose into simpler sugars, glucose and galactose.

Batch Process (Pre-Hydrolysis) - In the batch process, a neutral lactase enzyme is added to a tank containing raw or thermized milk, where it is incubated for approximately 24 hours at low temperatures (4–8 °C) to prevent microbial growth. After this incubation, the milk undergoes pasteurization, homogenization, and packaging. This method is favored by many producers, although the aseptic process has gained popularity, particularly for UHT milk. Key considerations for the batch process include:

- **Enzyme Dosage** : The amount of lactase used must be sufficient to achieve the desired lactose reduction within the limited time and temperature constraints. High enzyme activity at neutral pH and low temperatures is crucial.
- **Process Control** : The lactose conversion can be monitored in real-time, allowing for adjustments in enzyme dosage or incubation time as needed.
- **Production Efficiency** : Since the batch process is discontinuous, it may limit productivity in high-demand environments. Utilizing lactases with higher specific activity can help reduce production time and increase throughput.
- **Quality Assurance** : The short storage time at refrigerated conditions and subsequent pasteurization help mitigate any potential side effects from the enzyme preparation, ensuring a high-quality final product.

Aseptic Process (Post-Hydrolysis) - The aseptic process involves initially sterilizing the milk using UHT methods, followed by the injection of a sterile lactase preparation just before packaging. This approach allows lactose hydrolysis to occur within the sealed package, which can remain at ambient temperatures for a few days to facilitate complete lactose breakdown. Important aspects of the aseptic process include:

- **Lower Enzyme Dosage** : The enzyme dosage can be reduced compared to the batch process due to the higher incubation temperatures and shorter processing times.
- **Specialized Equipment** : The aseptic process requires advanced equipment and trained personnel to prevent microbial contamination during lactase injection.

- **Continuous Operation** : When organized effectively, this method allows for continuous production, which is advantageous for facilities with high output requirements.
- **Quality Control** : The quality of the lactase enzyme is critical to prevent off-flavors and ensure product stability during shelf life. Arylsulfatase-free lactases are recommended to avoid undesirable flavors that can arise from storage.

The regulations governing the labelling of lactose-free and lactose-reduced products differ from country to country. Food producers must navigate these varying standards, taking into account their specific recipes, production technologies, quality control measures, and market positioning. In some regions, the threshold for labelling a product as lactose-free has become stricter, with some countries requiring lactose levels to be reduced to less than 0.01% to qualify for this designation. This means that a half-liter of lactose-free milk may contain less than 50 mg of lactose, significantly lower than the amounts that would typically cause discomfort for those with lactose intolerance.

Lactose hydrolysis not only affects lactose levels but also alters the sensory properties of milk. The breakdown of lactose increases the sweetness of the milk, which is generally well-received in regions like Latin America and Asia. The Maillard reaction, which occurs more readily in the presence of monosaccharides, can lead to browning and off-flavors in lactose-free milk, particularly when stored at elevated temperatures. This reaction is a significant factor influencing the shelf life of lactose-free products compared to regular milk.

Conclusion

The production of lactose-free milk is a complex process that requires careful consideration of consumer preferences, regulatory standards, and technological capabilities. By employing innovative methods such as batch and aseptic processes, dairy manufacturers can effectively meet the growing demand for lactose-free products while ensuring high quality and safety. As consumer awareness continues to rise, the dairy industry is poised to adapt and thrive in this evolving market landscape.

Hydrolyzed Vegetable Protein : A Versatile Flavor Enhancer



Hydrolyzed Vegetable Protein (HVP) is a widely used flavor enhancer in the food industry, incorporated into a diverse range of processed foods, from soups and sauces to snacks and meat products. Renowned for its ability to replicate the savory, umami taste often linked to monosodium glutamate (MSG), HVP has gained significant prominence due to its plant-based origin.

What is Hydrolyzed Vegetable Protein ?

HVP is produced by breaking down the protein molecules from plant-based sources, such as soy, corn, wheat, or a combination of these, through a process called hydrolysis. This process can be achieved using either acid hydrolysis or enzymatic hydrolysis. In acid hydrolysis, the plant-based proteins are boiled in hydrochloric acid, which breaks down the protein chains into their constituent amino acids. The resulting solution is then neutralized with a base, such as sodium hydroxide, leaving behind sodium chloride (table salt) as a byproduct.

Alternatively, enzymatic hydrolysis utilizes proteolytic enzymes to break down the proteins under more neutral pH conditions and lower temperatures. This method typically results in a milder, less intense flavor profile compared to acid hydrolysis. The type of hydrolysis, as well as the specific plant-based source and other production factors, can influence the final organoleptic properties of the HVP, such as color, aroma, and flavor intensity.

Uses of Hydrolyzed Vegetable Protein in the Food Industry

HVP's versatility has led to its widespread use in enhancing the flavor of various processed foods. Key applications include:

- **Soups, Gravies, and Sauces** : HVP is commonly used to restore the flavor of these products, which may be lost during canning, freezing, or drying processes.
- **Meat and Meat Alternatives** : HVP is used in both real and imitation meat products, such as beef, chicken, and vegetarian burgers, to provide a savory, umami-rich flavor.
- **Snack Foods** : HVP is added to chips, pretzels, and other savory snacks to boost their flavor profile.
- **Seasonings and Spice Mixes** : HVP serves as a key ingredient in various seasoning blends, providing a meaty, savory note.
- **Vegetarian and Vegan Products** : As a plant-based ingredient, HVP is well-suited for use in vegetarian and vegan food items, offering a meat-like flavor without the use of animal-derived ingredients.

Comparison with Monosodium Glutamate (MSG)

HVP is often compared to monosodium glutamate (MSG), as both ingredients contain glutamic acid, which contributes to the umami flavor profile. However, there are some key differences between the two:

- **Composition** : While MSG is a pure sodium salt of glutamic acid, HVP contains a range of amino acids, including glutamic acid, which makes up approximately 10-30% of the final product.

- **Perception** : Some consumers perceive HVP as a more "natural" alternative to MSG, as it is derived from plant-based sources, even though both contain glutamic acid.
- **Sensitivity** : Individuals who are sensitive to MSG may also experience adverse reactions to HVP, as it can still contain a significant amount of glutamate.

Potential Side Effects and Regulatory Considerations

While HVP is generally recognized as safe by regulatory bodies, there are some potential side effects and considerations to be aware of:

- **Allergic Reactions** : Individuals with allergies to the source vegetables, such as soy, corn, or wheat, may experience allergic reactions to HVP.
- **Glutamate Sensitivity** : Some people may be sensitive to the glutamate content in HVP, which can lead to symptoms like headaches, sweating, and facial pressure.
- **Sodium Content** : HVP can contribute to the overall sodium content of a product, which may be a concern for those monitoring their sodium intake.



Regulatory bodies, such as the U.S. Food and Drug Administration (FDA), monitor the use of HVP in food products to ensure they meet safety standards. However, the labeling requirements for HVP can be complex, as the specific source of the protein may not always be clearly identified.

Market Trends and Growth

The global market for HVP is expected to experience significant growth in the coming years. According to market research, the HVP market is projected to grow at a compound annual growth rate (CAGR) of 4.9% and reach a revenue of \$3,619.28 million by 2033. This growth can be attributed to several factors, including the increasing demand for plant-based and natural food ingredients, the rising popularity of vegetarian and vegan diets, and the ongoing search for effective flavor enhancers that can replace synthetic additives like MSG.

Conclusion

Hydrolyzed Vegetable Protein is a versatile flavor enhancer with widespread applications in the food industry. Its plant-based origin and ability to mimic MSG's umami taste have contributed to its popularity. While potential side effects and regulatory considerations exist, HVP offers nutritional benefits and is generally safe when consumed in moderation. As the demand for natural and plant-based food products grows, HVP's market is expected to flourish. Understanding HVP's nuances is crucial for both food manufacturers and consumers in making informed decisions about its use and incorporation into food products.



Elevate the Experience

Innovative Recipes for Foodtech Enthusiasts

Gummy Candy

Ingredient	Amount %	Procedure
Water	30	<ul style="list-style-type: none"> • Mix Pectin, preservatives, Sodium Citrate, 20% Sugar. • Add dry mix to water while mixing, add dry mix to the water and blend. • Apply heat, bringing the solution to a boil. • Add corn syrup while boiling. • Add remaining sugar while maintaining boiling. • Boil to 75° Brix. • Add flavour, Citric acid and colour (if required). • Pour into silicon molds and allow to set for 10-12 hrs.
Sugar	35.5	
40DE Corn Syrup	31	
Slow Set Pectin	1.8	
Citric Acid	1.1	
Sodium Citrate	0.32	
Flavour	0.18	
Potassium Sorbate	0.05	
Sodium Benzoate	0.05	
TOTAL	100	



Walmart's Great Value Apple Juice Recall: A Closer Look at Arsenic Levels



The recent recall of Walmart's Great Value Apple Juice has raised concerns due to elevated levels of inorganic arsenic. This voluntary recall affects approximately 9,535 cases of the product, which is sold in six-packs of 8-ounce bottles. The recall was initiated by the manufacturer, Refresco Beverages US Inc., and was announced on August 15, 2024, with further updates on August 23.

Concerns About Arsenic Levels

The U.S. Food and Drug Administration (FDA) has flagged the presence of inorganic arsenic in the recalled apple juice, stating that the levels exceed the established action limit of 10 parts per billion (ppb). The FDA emphasizes that inorganic arsenic is more harmful than organic arsenic, which is typically found in seafood. Long-term exposure to inorganic arsenic can lead to serious health issues, including skin disorders and an increased risk of various cancers, such as skin, bladder, and lung cancers. Additionally, cardiovascular disease has been linked to long-term arsenic exposure.

Short-term exposure can cause acute symptoms like nausea, vomiting, bruising, and numbness or burning sensations in the extremities. The World Health Organization (WHO) has classified inorganic arsenic as a confirmed carcinogen and recognizes it as a global contaminant in drinking water.

Details of the Recall

The recall is part of a broader initiative to reduce dietary exposure to contaminants. Refresco Beverages acknowledged that certain lots of their 100% apple juice contained inorganic arsenic slightly above the FDA's action level. Walmart has responded by removing the affected products from their stores and is collaborating with the supplier to investigate the situation. Antonella Sacconi, a spokesperson for Refresco Beverages US Inc., stated, "We are aware that certain lots of the 100% apple juice we previously manufactured contain inorganic arsenic slightly above the FDA's 10 ppb (parts per billion) action level."

The recall specifically targets nearly 10,000 cases of Great Value apple juice due to potential inorganic arsenic contamination. The FDA has classified this recall as Class II, indicating that while the product may cause temporary or medically reversible health issues, the likelihood of severe health consequences is considered low.



The Nature of Arsenic Compounds - Inorganic arsenic compounds, which are typically found in water sources, are highly toxic, while organic arsenic compounds, commonly found in seafood, are generally considered less harmful. This distinction is crucial for understanding the health risks associated with arsenic exposure, especially for consumers of apple juice.

Health Implications of Arsenic Exposure - The FDA reported that the inorganic arsenic levels in the recalled apple juice were measured at 13.2 ppb, surpassing the FDA's established upper limit of 10 parts per billion. This is particularly concerning for young children, as high levels of arsenic exposure have been linked to neurological effects, including learning disabilities and behavioral challenges. For adults, long-term exposure can also lead to skin disorders and an increased risk of various cancers. The health risks associated with arsenic exposure highlight the importance of stringent food safety standards. The FDA continues to monitor the situation and provide guidance to help minimize exposure to harmful contaminants in food and beverages.

Conclusion

The recall of Great Value apple juice due to arsenic contamination underscores significant public health concerns. Consumers are encouraged to check their purchases and stay informed about product recalls, especially those involving food and beverages that may pose health risks. Retailers like Walmart are taking proactive steps to ensure consumer safety by removing affected products from their shelves and cooperating with manufacturers.

As the situation unfolds, it is essential for consumers to remain vigilant about potential health risks associated with food products. The FDA and other health agencies are actively monitoring the situation and providing necessary guidance to minimize exposure to harmful substances in food and beverages. In summary, while the levels of inorganic arsenic found in the recalled apple juice are concerning, the FDA has indicated that the likelihood of serious health issues arising from this recall is low. Consumers should remain aware and take appropriate actions to ensure their safety.

Effects of Fermentation of Cereals on Nutritional Absorption

Fermentation is a traditional process that significantly enhances the nutritional quality of cereals by modifying their composition and improving the bioavailability of essential nutrients. This method relies on the action of microorganisms, such as lactic acid bacteria and yeasts, which break down complex compounds found in grains, ultimately leading to better nutrient absorption. The fermentation of cereals not only alters their flavor and texture but also boosts their health benefits, making them a valuable component of a balanced diet.

Enhanced Digestibility

One of the key benefits of fermentation is its ability to activate various enzymes that play crucial roles in enhancing digestibility. For example, the enzyme α -amylase hydrolyzes starch into maltodextrins and simple sugars, facilitating the breakdown of complex carbohydrates into more digestible forms.

This enzymatic action increases glucose levels, which serves as a substrate for further microbial fermentation, thereby enhancing overall energy absorption. Following this process, maltase further breaks down maltodextrins into glucose, improving the availability of simple sugars that the body can readily utilize.

Protein Modification

Proteins in cereals also undergo significant changes during fermentation. The action of proteases hydrolyzes proteins into smaller peptides and free amino acids, making them more accessible for absorption. This process is particularly beneficial as it can elevate protein digestibility to levels comparable to that of meat. Specific strains of bacteria, such as *Lactobacillus plantarum*, have been shown to enhance protein digestibility by degrading antinutritional factors like tannins and protease inhibitors, which otherwise hinder protein absorption.

Reduction of Antinutritional Compounds

In addition to improving protein and carbohydrate digestibility, fermentation effectively reduces levels of antinutritional compounds found in cereals. Phytic acid is a primary antinutrient that binds minerals such as iron and zinc, inhibiting their absorption in the body. The enzyme phytase, produced during fermentation, breaks down phytic acid, thereby enhancing the bioavailability of these essential minerals. This reduction of antinutrients is especially crucial for populations that rely heavily on unrefined cereals, where mineral deficiencies are common. Studies have indicated that fermented cereal products contain higher mineral concentrations compared to their non-fermented counterparts, thanks to the degradation of phytic acid and other binding agents.

Amino Acid Profile and Antioxidant Properties

The fermentation process also alters the amino acid profile of cereals, often increasing the levels of essential amino acids such as lysine and methionine. This transformation occurs as microorganisms metabolize proteins, releasing free amino acids that the body can absorb more readily.

Some research suggests that specific fermentation techniques can lead to significant increases in these free amino acids, enhancing the overall nutritional profile of the cereal. The generation of bioactive compounds during fermentation contributes to this enhanced antioxidant activity, which can help combat oxidative stress and improve overall health outcomes. Fermented cereals often contain higher levels of phenolic acids and other antioxidants, providing additional health benefits associated with their consumption.

Conclusion

In summary, the fermentation of cereals yields numerous significant advantages that enhance their nutritional value. These benefits include improved digestibility, increased protein quality, enhanced mineral availability, and elevated antioxidant activity. By activating a range of enzymes, fermentation breaks down complex carbohydrates and proteins while reducing antinutritional compounds and enhancing nutrient bioavailability.

This transformative process not only makes fermented cereals more nutritious but also contributes to better health outcomes—particularly for individuals and populations with limited access to diverse food sources. The implications of these findings are profound, especially in a world where many populations face food insecurity and nutrient deficiencies. Regular consumption of fermented cereals may support overall health by reducing the risk of chronic diseases such as heart disease and diabetes. Furthermore, the beneficial bacteria produced during fermentation can help restore gut flora balance, promoting digestive health and potentially enhancing immune function.

As research continues to uncover the benefits of fermentation and the potential of specific microbial strains to optimize these effects, it becomes increasingly clear that fermented cereal products can play a vital role in a healthy diet. By improving digestibility and nutrient absorption, fermentation not only enhances the culinary experience but also offers a pathway to improved health for populations worldwide.

Schedule of Events

Discover the World of Professional expertise,
innovation, and culinary mastery.

Event Name	Dates	Venue
Drink Technology India	23-25 October, 2024	Bombay Exhibition Centre, Mumbai
PackMach Asia Expo	23-25 October, 2024	Bombay Exhibition Centre, Mumbai
World Tea & Coffee Expo	23-25 October, 2024	Bombay Exhibition Centre, Mumbai
Label Expo India	14-17 November, 2024	India Expo Centre & Mart, Greater Noida, India
World Mithai Namkeen Convention & Expo	18-20 December, 2024	Yashobhoomi(IICC), New Delhi, India





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