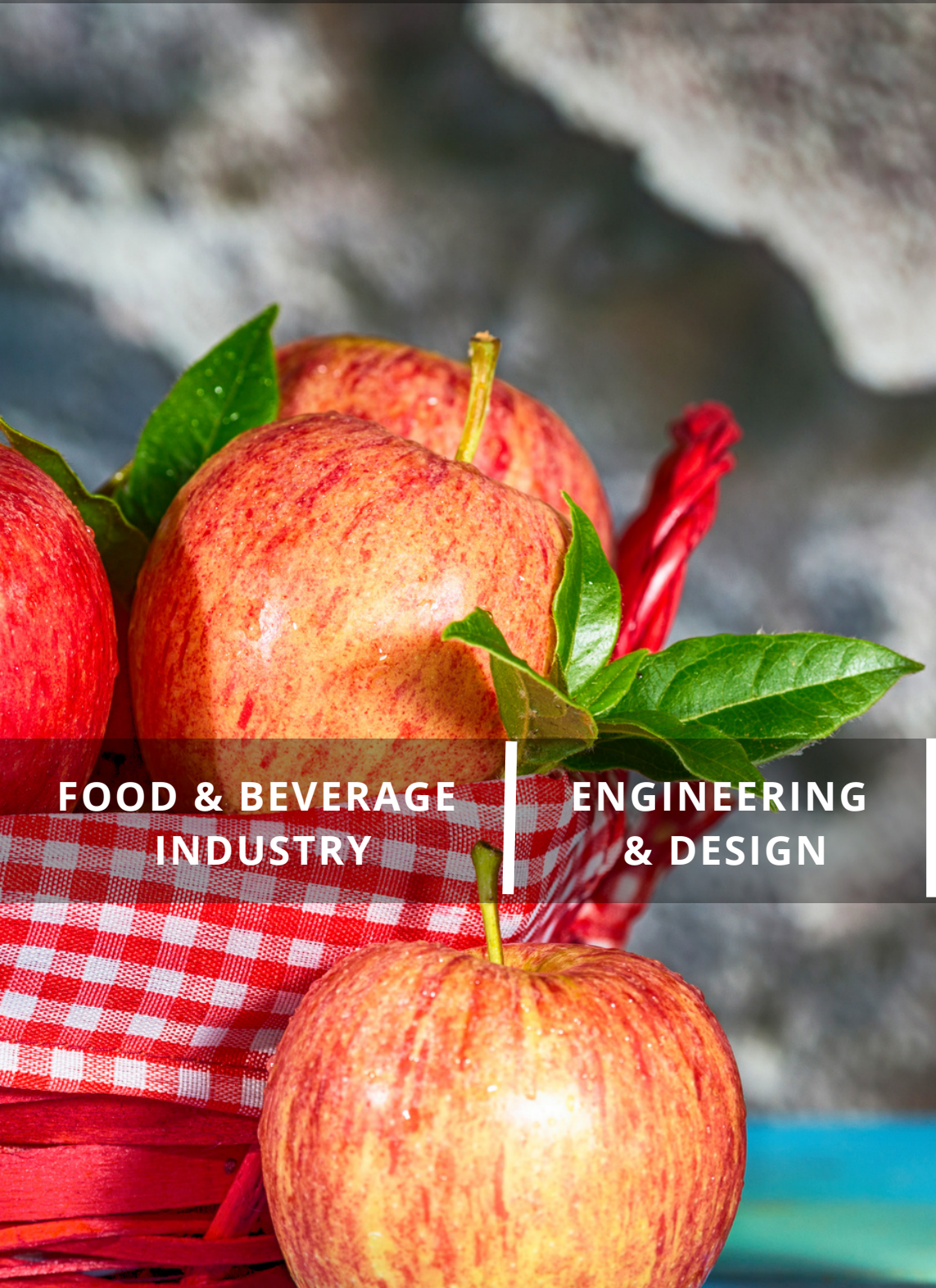


TECH-KNOWLEDGE

The Official PMG Engineering Newsletter

A still life photograph featuring several ripe red apples with green leaves, some resting on a red and white checkered cloth. A red chili pepper is also visible among the apples. The background is a soft-focus grey and white pattern.

**FOOD & BEVERAGE
INDUSTRY**

**ENGINEERING
& DESIGN**

A close-up photograph of a glass bottle containing a golden-yellow liquid, likely olive oil. The bottle has a cork stopper and is set against a blurred background.

**SCIENCE &
TECHNOLOGY**

CONTENTS



1. WHITE PAPER

- A. Introduction and process flow of Apple Cider Vinegar
- B. Industrial Basket Strainer

2-5

2. INDUSTRY BUZZ

Latest Food Industry News Updates

6-7



3. WEEKS HIGHLIGHT

A Look Into The Main Events Of The Week

8-9

4. DID YOU KNOW?

Fascinating Food Facts To Expand Knowledge

10-14



INTRODUCTION AND PROCESS FLOW OF APPLE CIDER VINEGAR

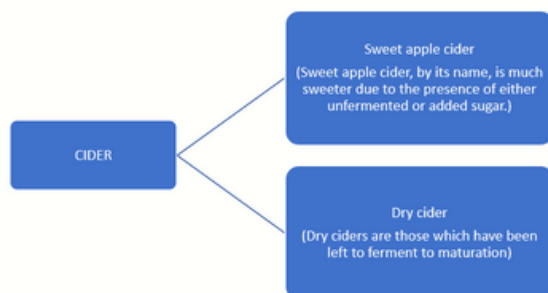


Introduction

In the processing industry, apples are often used for the production of sauce and juice, but can also be processed into other products, such as cider and cider vinegar. Cider and vinegar are both produced by fermentation.

Cider:

Cider is an alcoholic beverage made from fermented apple juice (at least in England). However, in the US, 'cider' meant rough apple juice while 'hard cider' is the fermented stuff. Various types of apples are needed to make good blended cider.



Principle:

Fermentation is the basis of Vinegar processing. During alcoholic fermentation, yeasts utilise sugar in apple juice to produce ethanol, an anaerobic process that results in cider. The production of vinegar involves an additional aerobic fermentation step, where acetic acid bacteria convert ethanol in cider into acetic acid. The sensorial characteristics of cider and vinegar depend on the fermentation processes microorganisms and the selected processing techniques.

Production:

1. Harvesting: Harvesting is done between September and December, manual collection is done by sacks, and more extensive orchards are harvested mechanically.

2. Selection of Apples: Apples should be firm and ripe. Green, under mature apples cause a flat flavour.

3. Sweating: It is optional mellowing period, the apples are stored in a clean, odour free area, sometimes they are allowed to mellow and soften for about a week to ten days before grinding

[READ MORE....](#)



4. Washing: After the apples have mellowed, they must be washed to remove leaves, twigs, insects, spray residues, and harmful bacteria. They are automatically poured out from the bins onto a scrubber. This machine rinses and scrubs each apple, removing most chemical residues from the skin. From there, they are moved along a conveyor to a hopper filled with water. From the hopper, the apples are put on a conveyor and moved to another worker. Jets of water aid in moving the apples to ensure proper cleaning.

5. Grinding: As apples are a hard fruit, slicing is necessary to facilitate juice extraction. This is done with high-speed rotary blades, which reduce the fruit to a pulp or the apples are put in a large mill and ground to a fine pulp with applesauce consistency. It is done to ensure that the maximum amount of juice can be extracted from the apples.

6. Pressing : To extract the juice from the mash, three main types of presses are used in commercial production of apple juice; the hydraulic press, the screw press and the belt press. Unlike the hydraulic press, the screw press is operated continuously and has a high working capacity. Two additional types of presses are the bladder press and the basket press. These are mainly used in small and medium-scale production.

7. Pasterurization: It is done around 92°C for 10-15 sec. It is done to kill all the unwanted microorganism.

8. Cooling and Filling: The juice expelled from the pomace is pumped through plastic tubes to a cooling tank. As the cider is transferred to the cooling tanks, it is passed through a screen mesh to remove any pulp pieces from the liquid. It is then chilled and stored at 33° F (0.6° C). This helps to inhibit the contamination by undesirable microorganisms. Preservatives such as potassium sorbate are added and the juice is sent off to the fermentation tank.



9. Fermentation: The apple juice ferments for eight weeks often in two stages This includes classical alcoholic fermentation of sugars into ethanol performed by yeast strains followed by acetobacter fermentation to produce vinegar.

10. Racking off: Using a clean plastic tube, the cider is drained off into the second fermenting tank or directly into bottles.

11. Filtering or fining: This step makes a cider crystal clear. It can be done by:

- a) Using a closed filter system avoiding exposing the cider to air.
- b) Mixing gelatin, bentonite, and pectic enzyme into the cider to clear unwanted material.

12. Aging and Bottling: Ageing is done in oak barrels to enhance the flavour. Use sterile bottles for cider. For an "in-bottle fermentation" small amount of sugars may be added to each bottle. Cap or cork the bottle and then pasteurize the cider to prevent further fermentation. To avoid killing the yeast by pasteurization after adding sugar, the addition of sulphur is most practiced.

Conclusion

Cider is made from fermenting apple juice, which relies on natural yeast present in the apples for fermentation . In the United States, fermented alcoholic apple juice is called "hard cider," while freshly pressed, nonalcoholic cider is called "sweet cider." It contains acetic acid and nutrients such as B vitamins and vitamin C.

INDUSTRIAL BASKET STRAINER



Introduction

We are very well aware about the fact that physical contaminants can be the biggest disaster in food manufacturing industries, this is the reason why food technologists / engineers install devices like sifter, magnet trap, basket strainers, disc filters in process for eliminating foreign bodies that not only helps in achieving food safety goals but also reduces maintenance cost and downtime by protecting valuable equipment like flow meters, heat exchangers, valves, cooling towers, spray nozzles, pumps, valves, pasteurizer etc. from the damage associated with nuts, bolts, metal shavings etc. But to achieve removal of the foreign bodies from the pipeline system conveying process fluids, basket strainer becomes the most preferred choice among the available options as it can remove both-metallic and non-metallic contaminants up to specific particle size.

1.Sanitary Basket Strainers

These are closed vessel consisting of wire mesh screens which traps solid debris from the process fluids. Installation of basket strainers in food industries is considered as a good practice for removing contaminants, regulating product size, or bettering product quality. The mesh is designed in many sizes and shapes and is either woven or welded together.

2.Types of Strainers-

1. **Coarse Strainers** – for large particles
2. **Medium Strainers** – for particles 75 to 1905 microns
3. **Fine Strainers** – for particles down to 5 microns

3. Components

a.Industrial Basket Strainer Housing: It is the outer covering of the strainer in which basket assembly rests.

b.Filter Element: It is a cleanable screen, built in basket strainer to allow filtering of larger particles or dirt in the pipe system. Basket straining element is either made of straight or staggering perforated plates.

c.Handle: It is ergonomically designed handle for easy removal/installation of basket assembly.

d.Internal Cylinder: It closes the inlet and outlet for replacement of dirty elements by turning position.

e.Vent Valve: Used for pressure relief.

f.Clogging Indicator: It indicates when filter element requires replacement.

[READ MORE....](#)



g.Blow off Valve: It removes dirt particles and help strainer bodies to clean.

h.Inlet Port: It is the point from where contaminated process fluid enters the strainer element.

i.Outlet Port: It is the point from where clean fluid exits the strainer element.

4. Designing Parameters for Basket Filter

a.Material of Construction of Removable Basket Assembly: Beverage and food strainers are manufactured from stainless steel mesh (304/316L), but other corrosion resistant alloys can be used for processing highly corrosive fluids.

b.Type of Process: It is critical for model selection to understand that if process has to operate under batch or continuous mode.

c.Nature of Fluid: It is Paramount to know if the fluid is liquid, gaseous, abrasive, corrosive in nature.

d.Process Parameters: Whenever you are buying an industrial basket strainer to install in a piping system, ensure that the system parameters like working pressure, temperature, flow rate etc. must match with strainer's standard specifications.

e.Easy to Clean: Low surface roughness makes basket strainers extremely easy to clean, which is important for maintaining product safety. Any corrosion could lead to bacterial growth that causes contamination and potential health issues for consumers.

f.Flow Rate: It is important to know the process flow rate as it decides whether model of basket filter will be able to withstand it or not.

g.Mesh Size: Mesh Size indicates the particle retention by cleanable screen.

i.Fabrication: The industrial welded simplex basket strainers manufacturers uses either bolts or welding to join various components. But still fully welded strainers are better than the casted ones as they offer zero leakage and superior cleanability.

j.Location of Installation: As per standard engineering practices, strainers are employed in pipelines to protect downstream mechanical equipment such as condensers, heat exchanges, pumps, compressor, meters, spray nozzles, turbines, steam traps, etc. from the detrimental effect of sediment, rust, pipe scale or other extraneous debris.

Conclusion

Basket Strainers are now no longer confined to a simple cast body with a wire mesh screen, but are a technical, highly refined, carefully designed piece of equipment. So, before you buy any basket strainer, ensure you understand every detail mentioned above. More Importantly, identify a trusted and reliable manufacturer for purchase of it.



INDUSTRY BUZZ



Experience cutting-edge ingredients & technology in the bakery industry.

From November 29 to December 1, 2023, the 16th edition of Bakery Business will take place at the Jio World Convention Centre in BKC, Mumbai. This year, which boasts more than 160 exhibitors from India and outside, is expected to impress and motivate more than 15,000 industry professionals.

Over the years, the exhibition has generated a potentially enormous demand for showing and acquiring innovative baking ingredients and technologies. It will be a pivotal time in the company's history.

Bakery Business is a focused show for industry professionals showcasing the newest industry advancements. Attendees can experience the latest baking technology for every kind of bread and bakery item: rolls, cookies, sweet goods, tortillas, snack foods, biscuits, crackers, and more.



Paras and the governor of the Brazilian state of Mato Grosso had a bilateral meeting.

Mauro Mendes Ferreira, the governor of Brazil's State of Mato Grosso, met bilaterally with Pashupati Kumar Paras, the minister of food processing industries. Senior Ministry officials and Minhaj Alam, the assistant secretary, attended the meeting. Kenneth Nóbrega, Brazil's ambassador to India, and other top government officials travelled with the governor from Brazil.

The historical relationship that has existed between the two nations for more than 70 years was discussed by both parties. The recent high-level engagements and visits demonstrate both sides' commitment to enhancing bilateral ties, and this momentum has to be maintained and further reinforced. Paras emphasized that our respective countries' prime ministers had highly fruitful conversations outside the G20 and G7 summits.





Transforming animal nutrition: the market for insect proteins is expected to develop rapidly.

The market for insect proteins in animal feed has grown significantly worldwide, and in 2021, it will reach a value of about \$511 million. Driven by the acknowledgement of insects as a remarkably nourishing and eco-friendly feed material, the sector is anticipated to expand at a remarkable compound annual growth rate (CAGR) above 10% between 2022 and 2030. The increase in demand can be attributed to a paradigm shift in the way we think about animal nutrition, wherein insect proteins are becoming more critical in the search for high-quality, sustainable animal feeds.

Growing Knowledge of Insect Proteins: The use of alternative protein sources has increased recently due to expanding knowledge of the adverse environmental effects of traditional animal agricultural methods.

False packaging: The truth about PLA straws in India

As a result of the global movement to outlaw single-use plastic, many sustainable alternatives to plastic have been brought to market and heavily promoted through green marketing. A product that has gained popularity is the PLA (Polylactic Acid) straw, which is marketed as a more environmentally friendly option than traditional plastic straws.

Natural materials like sugarcane or maize starch are the source of PLA, an excellent substitute for natural plastic. With the introduction of the single-use plastic ban on July 1, 2022, its acceptance in the Indian market gained pace. But a disturbing truth still exists: some businesses are taking advantage of the environmental movement by greenwashing or passing off PLA straws to prove their dedication to sustainability. This dishonest practice misleads customers and impedes sincere attempts to protect the environment.



From bean to brew: Dissecting India's Coffee Supply Chain

Coffee is more than simply a morning stimulant; it's a ubiquitous beverage that affects millions of people's lives worldwide. A coffee bean travels a fascinating path through the Indian coffee supply chain from the time it is planted in the lush coffee-producing regions of India until it is expertly brewed and enjoyed by coffee connoisseurs. We'll walk you through every step of this comprehensive investigation, from seed to cup, revealing the subtleties and procedures that go into creating your everyday brew.

India's Farming & Cultivation: The Origins of Coffee

Our tour of the nation's coffee supply chain begins at the source, with the coffee farms dotting India's scenic landscapes. These farms are primarily located in areas with particular climates, which include the Nilgiri Hills the Western and Eastern Ghats.

WEEKS HIGHLIGHT

NON-TECHNICAL CONTENT



10 NOVEMBER

SCIENCE DAY

World Science Day for Peace and Development aims to ensure that citizens are kept informed of developments in science. It also underscores the role scientists play in broadening our understanding of our planet and in making our societies more sustainable.



11 NOVEMBER

DIWALI

Wishing you and your loved ones a Happy Diwali filled with prosperity, happiness, and the beautiful moments that make life truly special. May the coming year be as vibrant and successful as the lights that adorn our homes during this festive season.



13 NOVEMBER

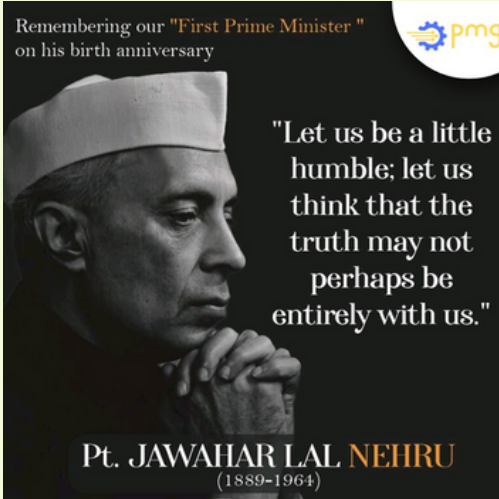
WORLD KINDNESS DAY

"World Kindness Day" is celebrated all over the world on 13th November. It promotes the importance of being kind to each other, to yourself, and to the world. This event started in Tokyo in 1997 under the name World Kindness Movement with the theme "KINDNESS", Theme of 2023 is "kindness can transform lives."

NOVEMBER

WEEKS HIGHLIGHT

Remembering our "First Prime Minister" on his birth anniversary

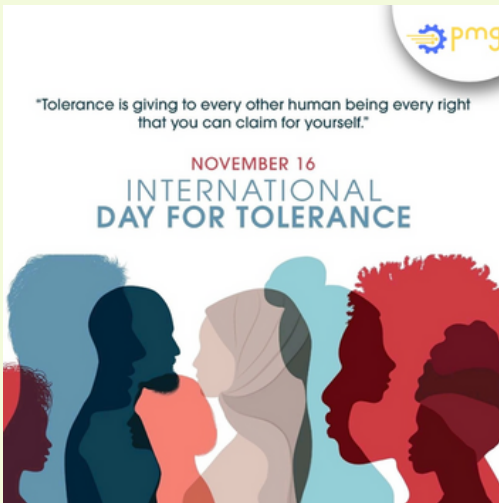


14 NOVEMBER

CHILDREN'S DAY

Pandit Jawaharlal Nehru was born on November 14, 1889 in Allahabad, India. He was the first prime minister of independent India and one of the principal leaders of India's independence movement. He is the architect of Modern India and was a great advocate of science and technology. It was his vision and foresight that led to the development of Science & Technology in India.

"Tolerance is giving to every other human being every right that you can claim for yourself."

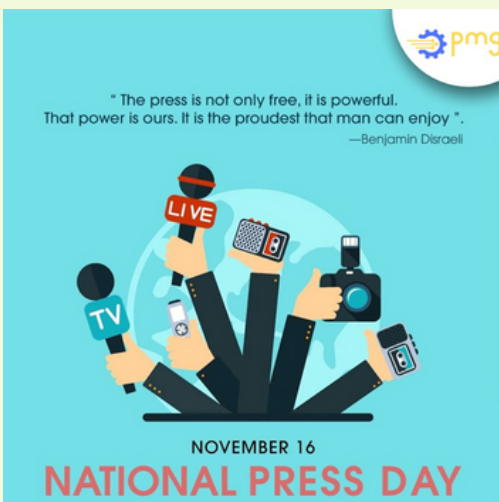


16 NOVEMBER

INTERNATIONAL DAY FOR TOLERANCE

We human beings have evolved and developed by sharing love, compassion and care. Celebrating International Day of tolerance is a souvenir to stand for the whole world regardless of race, colour, caste, creed, gender etc. Let us join our hands and celebrate this day for humanity!

"The press is not only free, it is powerful. That power is ours. It is the proudest that man can enjoy".
—Benjamin Disraeli

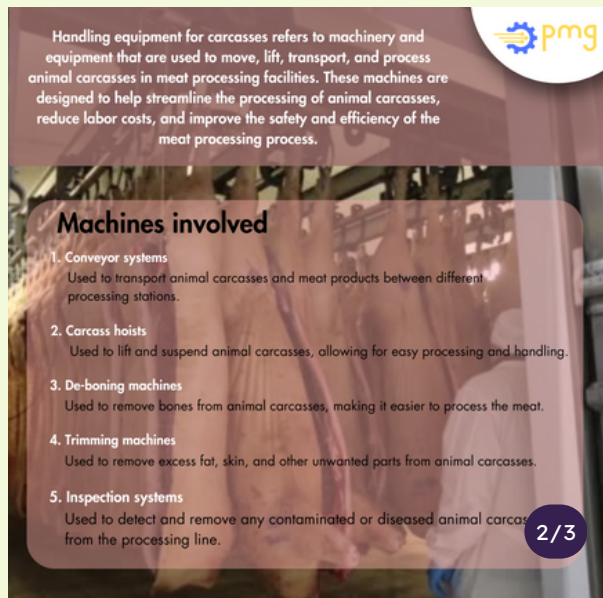


16 NOVEMBER

NATIONAL PRESS DAY

Press is one of the strongest pillars of democracy that should stand for the people. It is our duty to stand up and encourage the brave heroes of our nation who are working 24x7 to represent our voices.

DID YOU KNOW?



Fact 1

Effectively handling equipment for carcasses is essential in maintaining hygiene and ensuring efficient processing in the meat industry. Specialized tools such as hoists, conveyors, and processing machinery streamline the workflow, enhancing productivity and minimizing waste. Proper training and adherence to safety protocols are crucial for workers to operate this equipment, ensuring a seamless and hygienic process from carcass arrival to final product distribution.

SEMOLINA



1/3

Semolina is a course, gritty flour that is made from durum wheat commonly used in pasta making and, in some breads, cereals, and other foods.

Made by milling the endosperm of durum wheat, which is the hard part of the grain that is left after the bran and germ have been removed.



- Semolina is often yellow due to the high levels of carotenoids in durum wheat.

- A good source of protein, fiber, and several important nutrients, including iron and B vitamins.

- Semolina is used in producing bread, cereals, and other foods. It is a versatile ingredient used in a variety of applications and many cuisines worldwide, including Italian, Mediterranean, and Middle Eastern.



2/3

Market Scope

- The market for semolina is highly competitive, with many manufacturers and suppliers vying for market share.
- The major key players in the market include Barilla Group, Durum, Cargill, Bob's Red Mill, and Semolina Artisanal wheat. Other major players in the market for semolina include Ardent Mills, The Morning Star Company, Star of the West Milling, and others.
- Semolina is produced commercially through the milling of durum wheat.



3/3

Fact 2

Semolina, derived from durum wheat, is a coarse flour with a golden hue and versatile culinary applications. Rich in nutrients like protein and fiber, semolina is a staple in many cuisines globally. Its gritty texture makes it ideal for pasta, couscous, and various desserts. Beyond its culinary uses, semolina's nutritional profile contributes to a balanced diet, offering energy and essential minerals for overall well-being.

BARLEY PRODUCTS

1/3

Barley products are food products that are made from barley, a type of cereal grain that is widely consumed around the world. Barley is a good source of fiber, protein, vitamins, and minerals, which makes it a healthy and nutritious food choice.

Products

- 1. Barley flour**
A flour made from ground barley and used as a substitute for wheat flour in baking.
- 2. Pearl barley**
To remove the hull and outer bran layer, resulting in a product that cooks faster and is easier to digest.
- 3. Barley water**
Made by boiling barley in water and adding sweeteners and other flavorings.
- 4. Barley malt**
Made by sprouting barley grains and then drying and grinding them.
- 5. Barley flakes**
Made by rolling or flattening barley grains.
- 6. Barley bread**
Made from barley flour has a distinctive nutty flavour and dense texture.

2/3

Market Scope

- The major drivers of the barley product market is the increasing awareness of the health benefits of barley.
- The market for barley products is highly competitive and includes many global players and regional and local players.
- Some of the major players in the market include:
 1. Cargill, Inc.
 2. Archer Daniels Midland Company
 3. Global Bio-chem Technology Group Company Limited
 4. Malteurop Groupe
 5. Soufflet Group
 6. GrainCorp Limited
 7. Grain Millers, Inc.
 8. Muntions plc
 9. Boortmalt N.V.
 10. Harboe Group

3/3

Fact 3

"Barley products epitomize a wholesome and versatile nutritional choice, offering a spectrum of health benefits and culinary delights. From hearty barley soups to nutrient-packed barley flour, these products embody a commitment to well-being. Packed with fiber, vitamins, and minerals, barley items promote digestive health and satiety. Embrace the goodness of barley in every bite, cultivating a healthier lifestyle with each nourishing and flavorful creation."



Fruit preserves, jams, or jellies are sweet spreads made from fruits cooked with sugar and other ingredients to preserve flavor and extend shelf life. The cooking process causes the fruit to break down and release natural pectin, which thickens the mixture and helps it set into a spreadable consistency.

Steps

1. Selection and Preparation of Fruit

Selection of high-quality fruit and typically cleaned, washed, and sorted to remove any damaged or inferior fruit.

2. Cooking

Cooked with sugar and other ingredients, such as lemon juice or pectin, to create a thick, spreadable consistency.

3. Sterilization

Using a variety of methods, including pasteurization, which involves heating the preserve to a specific temperature for a specific amount of time, or using aseptic packaging, which involves filling the preserve into sterile containers.

2/3



Fact 4

Fruit preserves are delectable spreads crafted by cooking fresh fruits with sugar, resulting in a luscious consistency that captures the essence of ripe produce. These vibrant concoctions, often enriched with natural pectin, preserve the fruits' flavors, colors, and nutritional value. Whether enjoyed atop toast or as a versatile ingredient in culinary creations, fruit preserves offer a delightful fusion of sweetness and fruitiness, transforming ordinary moments into indulgent experiences.

MUSHROOM PRESERVES

1/3

Pickled mushrooms, is a type of preserved food made from mushrooms that have been soaked in vinegar, water, and spices. The mushrooms are typically first sautéed in butter or oil to give them flavor and to partially cook them before being pickled.

Used as a condiment or ingredient in various dishes such as sandwiches, salads, soups, and stews. It can also be served as an appetizer on its own or as part of a platter of other pickled vegetables.

Process

1. Sourcing the raw materials

most common are the button, cremini, shiitake, and portobello mushrooms.

2. Preparing the mushrooms

Washed and then sautéed in oil or butter to enhance their flavor and partially cook them. The mushrooms are then packed into jars or cans for further processing.

3. Processing for preservation

Immersed in vinegar, water, sugar, salt, and spices. The jars or cans are then heated to a specific temperature and time to ensure the mushrooms are properly preserved.

2/3

Market Scope

The global market for pickled vegetables is driven by factors such as increasing demand for convenient and healthy foods, growing popularity of international cuisine, and rising consumer awareness of the health benefits of pickled vegetables.

The market for mushroom preserves is the retail industry, with many supermarkets and specialty food stores offering a variety of pickled vegetables, including mushroom preserves.

There are several major players in the global market, including:

- The Pickling Company
- Hengstenberg
- Bonduelle
- Del Monte Foods
- Kühne
- Sanniti
- ADF Foods

3/3

Fact 5

Mushroom preserves offer a delectable and versatile addition to culinary creations, preserving the earthy goodness of mushrooms year-round. Through a meticulous process, these preserves capture the unique flavors and textures of various mushroom varieties, providing a convenient and flavorful ingredient for diverse dishes. Whether spread on toast, incorporated into sauces, or enjoyed as a savory condiment, mushroom preserves elevate the culinary experience with their rich, umami-packed profile.



PMG ENGINEERING

About PMG

Delivering End-to-End Engineering
Design & Construction Management in
Food & Beverage Industry



Meeting Global Benchmarks

In ENGINEERING DESIGN and PROJECT MANAGEMENT
for FOOD and BEVERAGE Industry with SINGLE POINT ACCOUNTABILITY

Process Engineering | Project Management | Mechanical | Electrical | Automation | Food Safety

PEOPLE DELIVERING RESULTS

Safe-by-choice. First Time Quality. Maximize Value. Objectivity.
Ownership. Reliable and Trustworthy Business.

- MAKING CUSTOMERS THE INDUSTRY LEADERS
- ENGINEERING MUST CREATE BUSINESS VALUE
- MEET THE EXPECTATIONS OF ALL STAKEHOLDERS
- OPTIMAL ENGINEERING

Website Link



Click Here

Follow Us on

