

# food **MARKETING & TECHNOLOGY** इंडिया



INGREDIENTS

**24** ANTI-OXIDANT  
RICH FOODS



PROCESSING

**40** THE PERFECT  
FORM FOR THE  
BAKERY

## INNOVATIVE PACKAGING



PACKAGING

**50** SUSTAINABLE  
PACKAGING  
SOLUTIONS FOR  
SUPERFOODS



**SICAL**  
A COFFEE DAY COMPANY

## Single Window for Integrated Logistics



**End to End  
Cold Chain Logistics Solutions through  
Innovation, Dedication & Technology**

**27 Distribution Centres  
14 Cold Stores  
205 Cities  
2550 Delivery Locations**



**Corporate Office**  
Sical Logistics Limited  
# 23/2, Coffee Day Square,  
Vittal Mallya Road,  
Bangalore - 560001  
Tel: +91 80 33402321

For further details: [www.sical.in](http://www.sical.in)

**Cold Chain Division Office**  
Sical Logistics Limited  
Texas Building, Global Village  
Technology Park, Mylasandra, Mysore Road,  
Bangalore - 560 059  
Tel: +91 80 46208888

Enquiry: [coldchain@sical.com](mailto:coldchain@sical.com)

Toll Free No. **1800-30-10-25-35**

# COLOURS THAT SCREAM FOR ICE-CREAM

Idacol offers the widest range of water soluble dyes ideally suited for colouring ice-cream. So if you are looking for colour precise, versatile and safe dyes for ice-creams and other dairy products, give us a shout.



# EFFICIENT OPERATIONS & SAFER FOOD

Where Service & Science Meet



Dairy Processing



Beverage Processing



Dairy Farm



Food Processing



Fresh Produce



Cheese Manufacturing

## CUSTOMIZED SOLUTIONS for your biggest business concerns



**Brand Protection:**

Customized solutions designed to help ensure the production of safe, quality food or beverages

**Improved Efficiency:**

Innovative chemistry and automated solutions that improve your operational efficiency, reduce total cost of operation and increase productivity

**Environmental Sustainability:**

Solutions designed to conserve water and energy and reduce waste

**Long-term Success:**

Collaboration with key organizations helps shape industry best practices and future standards

For more information, please contact us at [EcolabFBIndia@Ecolab.com](mailto:EcolabFBIndia@Ecolab.com)

Ecolab Food Safety & Hygiene Solutions Pvt. Ltd., Unit No 439/440, Level 4, A wing, Dynasty Business Park, Andheri Kurla Road, Andheri East, Mumbai - 400059, Maharashtra

[www.ecolab.com](http://www.ecolab.com)

FLAVOR  NOMICS

# Enriched Yummier Palette

for the Sweet toothed

Peacock flavourings integrate into your array of sugary confections with specialized flavoured ingredient effects ...enhancing both , their taste & aroma



**Gogia**

Gogia Chemical Industries Pvt. Ltd.

📍 C- 8/3 & 9/1, Site-C, UPSIDC Indl. Area, Surajpur 201306, Gautam Budh Nagar (U.P) India

☎ +91 120 2561285 - 90

✉ info@gogia.com

🌐 www.gogia.com

# State of the art packaging machines by Interpack



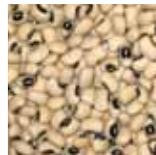
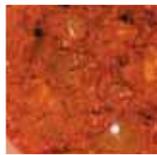
**PASTES**



**SOLIDS & GRANULES**



**POWDERS**



**CONFECTIONERY  
& SNACKS**



**GRANULES**



**interpack machines pvt. ltd.**

**Regd. Office :**

613, Siddhartha Towers, Behind City Pride,  
Kothrud, Pune - 411038 (INDIA)

Tel.: +91-20-2545 4172, 94220 16092

E-mail : [marketing.pune@interpackmachines.com](mailto:marketing.pune@interpackmachines.com)

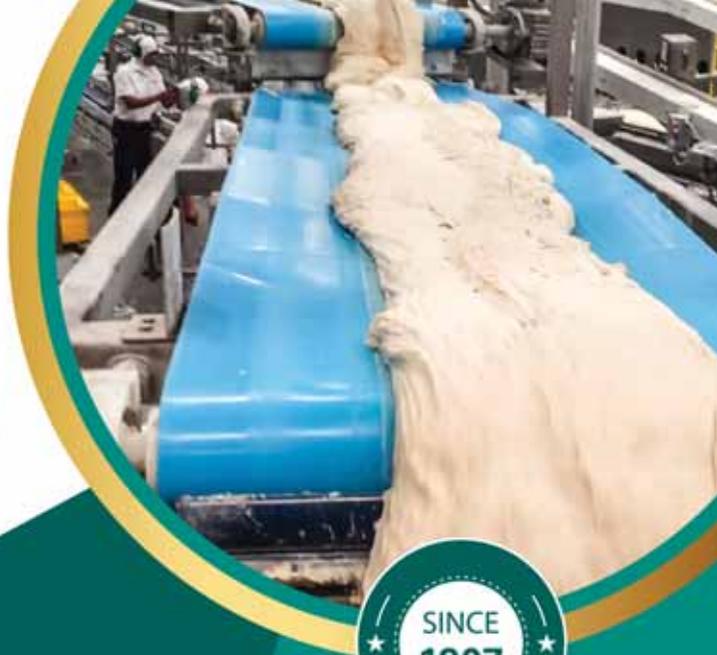
[www.interpackmachines.com](http://www.interpackmachines.com)



Partners in Productivity

# MAXIMISE YOUR BELT CONVEYOR PRODUCTIVITY USING FOOD GRADE PRE-CLEANER (FGP)

Effectively cleans material sticking on your belt



# 67% Cost Reduction in conveyor maintenance

## APPLICATIONS

- Vegetable/Fruit Processing
- Bakery
- Confectionary
- Meat & Poultry
- Dairy



FGP with UHMW Blade



FGP with Metal Detectable UHMW Blade



FGP with Metal Detectable Dual Durometer Blade

For free demo and technical queries/support reach us at the contact details listed below.

📍 New Door No. 51, Anna Salai, Nagalkeni, Pammal Village, Chennai - 600 044. Tamil Nadu, India  
 📞 +91-44-4856-6761 / +91-44-4856-6762  
 ✉ info.india@flexco.com

Please follow us on:  
  
 🌐 www.flexco.in



Scan for performance demo video

## High speed doors in the food industry

The range of door solutions that we offer at Gandhi Automations includes a variety of high speed doors (often known as "fast action roller doors") which are used regularly in the food and beverage industries.

High speed doors, by definition, are designed to be opened and closed rapidly to allow for ease of access in a warehouse or other environment that is subject to frequent vehicle activity. This translates into increased productivity in the workplace as there will be less time wasted during the process of operating traditional doors.

### Main features

It is a flexible high-speed door in PVC for indoors use, with no rigid elements and with a perimeter structure made entirely of stainless steel.

Thanks to its components and structure, keeping it clean is easy and it is extremely resistant to oxidation.

Characterized by wash proof frame and designed to avoid the collecting of liquid, dust or any impurity on the frame, this door is washable in all parts respecting the hygienic restrictions of the field.

Its speed will let the door maintain the different characteristics of the environment they are located in.

The absence of rigid elements inside the curtain, the resistive safety edge fitted to the bottom edge of the door, photocells and barriers make this product both safe and durable, being totally self-repairing.

Fast action roller doors are particularly well suited to the food and beverage industries because:

### Hygiene

Swift activating doors make it easier for frequent personnel and vehicle traffic whilst minimizing the time for contamination from dust, litter and the elements. With the flexible curtain being constructed from high-grade PVC, the doors can easily be regularly pressure washed and disinfected to maintain the required hygiene.



### Environmental Control

Minimizing the time for airflow is especially important in temperature-controlled environments typically used for the storage of ingredients and final products. When shut the high insulation properties of the door provide an effective thermal barrier between different temperature zones. Not to be forgotten, the environment for workers is made substantially more comfortable because of the ability to better regulate temperature and minimize drafts in a factory environment.

### Productivity

With curtain travel times as short as two seconds available, Gandhi Automations High Speed doors, are a real aid to productivity in busy factory and packing environments typical of the food industry.

### Customization

All of our high-speed doors can be customized to your own specifications: as well as the physical dimensions these can include safety mechanisms, visual panels that allow light into building and nearly any colour you want. They are suitable for interior (see the VR range) or exterior (see the VL range) applications

Gandhi Automation's High-Speed Doors are a key component in consistent climate control and contamination management. It's all about lean thinking; smart optimization and cutting waste.

Door Speed - Getting in and out quickly maximizes climate control

No matter whether food is frozen or fresh, keeping the environment cold throughout the entire product handling operation maintains quality and reduces waste.

Climate must be maintained. You can chill out since our high-speed doors open and close in seconds, preserving cold air inside high-traffic areas. Keeping your refrigeration

contained inside helps protect your product and operating budget... well, as long as your door moves fast enough!

### Door Speed - Boosts effort to reduce contamination

Air flow and traffic movement will cause number of contaminants to move with the product as it moves through the operation chain.

Why risk more contamination? There are many practices to reduce contaminants to an acceptable level including selecting the right door. Minimal door exposure time and a tight seal deliver consistent climate control AND reduce debris. Door options are available for high to low contact risk.

### Door Speed - Amplifies food safety

If a cold storage door is damaged, dented, or even misaligned causing gaps, the door will not be sealed properly. This can result in energy loss and threat to product quality.

High-speed doors are fast! Swift entrance and exits reduce the risk of damage to your doors and the roll-up design provides a tight seal.

Fast roll up doors for food industry by Gandhi Automations are designed to meet the stringent demands of hygiene in the food industry, Prime Food fast roll up doors are resistant to humidity, temperature, corrosion and detergents. It is very easy to clean and disinfect and where tight sealing while partial or full wash down is required. The smooth surface with shiny finish prevents dust build up and is resistant to pressure washing. The self-repairing system automatically resets the door after an accidental impact.

The robust construction of Prime Food provides high cycle operation even in wet applications. FDA approved Polystone® M-Natural guides available as standard for environments that demands rigorous cleaning routines. Fast roll up prime food doors are very useful in FMCG sector.

India's **No.1** Entrance Automation & Loading Bay Equipment Company



## Stainless Steel Rolling Shutters

- Stainless Steel Rolling Shutters are made of SS304 or SS316 interlocked profiles and are high grade high performance.
- They are capable of withstanding adverse weather conditions, thus providing 100% safety and security.
- They are easy to clean, have longevity and are low maintenance.
- These shutters are easy to operate, install and have a very good corrosion resistance while providing an appealing finish.
- The shutter slats are also available in larger sizes and can be customized to clients requirements.
- Operational safety is ensured through power limit.

Dock Levelers | Dock Shelters | Fire Rated Shutters / Doors | High Speed Doors | Sectional Overhead Doors



ISO 9001 : 2015, ISO 14001 : 2015  
BS OHSAS 18001 : 2007



TOLL FREE  
**1800 209 0200**  
From Anywhere in India



## Paper Packaging is the Future

Packaging is never far away from the main trends in the food industry. It is important because it protects the contents, whilst at the same time, promoting what is inside, through design and information and finally attracting the consumer to purchase and ultimately to repurchase.

However there is more to packaging than meets the eye. Sustainability is one of the main issues the industry is facing at the moment, in the light of increasing climate challenges. Plastic packaging is in focus, as consumers are moving away from synthetic and mineral oil-based barriers – and towards paper.

Paper has many advantages over other packaging solutions. The main one, is that it is a natural resource which is easily recycled and replaced. The customer perception is very good. Paper can also generate a lot of positive emotions, it is easy to print on and can be produced in a number of colours.

Questions have been asked of paper as a suitable barrier in food usage. This is a valid point. To find the right paper quality, the food manufacturer must know what he needs. Papers comes in so many different strengths and grades. New papers standards have removed the possibility of food contamination and even when recycled paper is used, the quality can be very high.

Of course, you cannot separate paper from sustainability. It is important to hold on to the positive reputation of paper and at the same time to develop it further. This reflects on every aspect of operations: sourcing, community and business.

New protective papers are being designed all the time, especially with customer convenience in mind. These will be seen at the Interpack show in Dusseldorf in May, where manufacturers, converters and end-users will come together and find solutions for their innovative products.

In packaging there are many innovative technologies developed specifically to meet a customer's changing needs, allowing different designs for differentiation and – ultimately – the quest to find a competitive edge.

Benno Keller  
keller@harnisch.com

Ian D. Healey  
healey@harnisch.com

Linda Brady Hawke

The last eight weeks were traumatic and frightening for many. News about the coronavirus outbreak, daily death tolls and rising numbers infected by the virus has become a public health emergency of international concern.

Some of the most common symptoms of coronavirus that you need to know are fever, cough, runny nose, sore throat and breathing problem. There are many directives and recommendation from public health agencies for minimising the spread of the virus; it's no surprise that eating well can help support the body's ability to fight off infections. There are other means to boost the body's defence mechanism. Here's how the immune system works, and how to keep it in balance.

The immune system is a network of cells, organs, proteins and antibodies that work to guard you against viruses, parasites and bacteria.

Every day we inhale one hundred million viruses and the immune system's job is to keep us safe. There are two main parts: the innate response and the acquired response.

The innate response works out what is friend and foe, then tries to flush out the attacker – it's this that can make us feel feverish. The acquired response remembers exact invaders and sends the right cells to kill them off.

Antioxidant-rich foods including berries, garlic and onion are necessary for building up the immune system, which fights off viruses. Eating anti-inflammatory rich foods is vital when it comes to the immune system. To ensure you are eating enough anti-inflammatory rich foods, up your intake of vegetables and fruits. Make sure you eat at least five-six vegetables each day that can help fight inflammation and ingredients such as turmeric have additional benefits.

A range of foodstuffs including grass-fed beef, lamb, spinach and oysters has zinc which helps skin and bones and is intensely useful for fighting the flu as it attacks the infected cells.

Foods rich in resveratrol such as pistachios, peanuts, grapes, red, white wine, strawberries, blueberries, cranberries and even cocoa and dark chocolate are helpful to fight fungal infection, ultraviolet radiation, stress, and injury. Anti-viral herbs such as dried basil, oregano, tulsi work great for immunity, and can be used in teas or curries for respiratory well-being including mucous problems which can become a breeding ground for bacteria.

Broccoli is a nutrient-packed powerhouse to upkeep your immune system. One cup of broccoli feeds equal amount of vitamin C as an orange. Broccoli supplies an array of B vitamins (B1, B2, B3, and B6). It is also high in beta-carotene, potassium, magnesium, zinc, and iron.

Boosting the health of your immune system is easy when you know which foods to eat.

# LINEAR ICE CREAM CONE FILLING MACHINE

One more successful launch by 'PANCHALS'



Model ICLF 6

- Intelligent servo indexing
- PLC controlled operations
- Can Fill 6 cones at a time - 50 ml to 120 ml size
- Output 10,000 to 12,000 cones / hour
- Accurate filling at promised speed

50 years of experience has made our machines more reliable, accurate and user friendly. We also have fillers for products like Curd, Cheese, Peanut butter, Margarine, Shrikhand, Ghee, Yoghurt, Jam, Milk Powder, Lassi .....



Celebrating **107<sup>th</sup>** Year  
1913 - 2020



**HYGRO**  
TECH ENGINEERS  
An ISO 9001:2015 CERTIFIED COMPANY



## MOISTURE PROBLEM..?? THINK HYGROTECH...!!!



**Desiccant Dehumidifier**

Hygro Technology Arrives to treat Moisture problems for many applications including but not limited to Food processing, Cold Storages, Seed Industries Pharmaceutical, Biotech, Lithium Battery Manufacturing, Civil ,R&D , Engineering, Automotive, Defence, Wood drying etc..

### HYGRO PROVIDES SOLUTION FOR:

- Condensation Prevention
- Mold/ Fungus Prevention
- Moisture Regain Prevention
- Corrosion Prevention
- Product Drying



**Compact Desiccant Dehumidifier**

### HYGRO PRODUCTS TO TREAT MOISTURE PROBLEMS

- Desiccant Dehumidifiers
- Dry Rooms
- Lithium Battery Dry Rooms
- Product Drying Chambers
- Seed Box Dryer
- Dehumidified Drying Chambers
- Gas Purification System
- Conveyor Dryers
- Industrial Ovens / Drying Ovens
- Walk-in Humidity Chambers
- Wood Drying Kilns
- Battery Plate Curing and Drying Chambers
- Online Drying Ovens

### Applications



**Product Drying chambers**

Hygro Provides a Turnkey Humidity and Temperature control solutions in Food processing industries, Cold storages, Seed processing industries, Beverage industries etc...

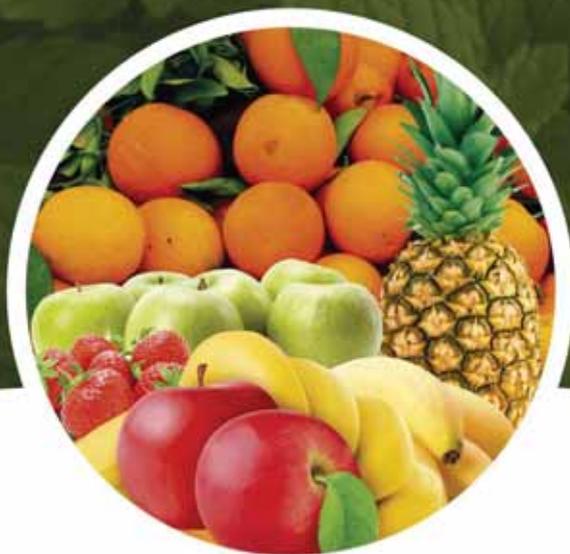
**Conveyor Drying Ovens**



### HygroTech Engineers

No. 61 & 62 Kachohalli gate, Magadi Road, Behind Rajarajeshwari Kalyana Mandapa , Bangalore - 580091  
E-mail: [sales@hygrotech@india.com](mailto:sales@hygrotech@india.com) Mob:+91 9886144100 Website: [www.hygrotechindia.com](http://www.hygrotechindia.com)

NOW  
**NATURAL  
FLAVOURS  
NATURAL  
FOOD COLOURS &  
NATURAL  
INGREDIENTS**



NATURALLY  
YOURS



**sonarome**

India's No.1 flavour company

**Sonarome Private Limited**

One Sonarome Way  
KIADB Industrial Area,  
Doddaballapur  
Bangalore 561 203 INDIA

**T** +91 80 3090 2200

+91 80 3090 2288

**F** +91 80 3090 2299

sonarome@sonarome.com

[www.sonarome.com](http://www.sonarome.com)

Partners



An ISO 22000, GMP, Halal & Kosher Certified Company.

*Your ingredient for success...!*

# Contents

March 2020

## Market Research

- 22 Focus on exports can get better farm remuneration



## Ingredients

- 24 Anti-oxidant Rich Foods
- 28 Tastes Differ in a Global Industry
- 30 Food Flavours: Understanding Food Additives



## Processing

- 38 Automation in the Food Industry
- 40 The Perfect Form for the Bakery
- 42 Accelerated Shelf-life Testing - A basic understanding



## Packaging



- 48 Innovative Packaging for OSI's Beef Steaks: Less Plastic, High-Class Optics, Excellent Quality
- 50 Sustainable Packaging Solutions for Superfoods



## THE PERFECT SHADE THAT WILL NOT FADE

### PRESENTING NATRACOL'S VIBRA YELLOW FOR CONSISTENCY OF SHADES

Natracol Vibra Yellow is available in an easy-to-use water dispersible liquid format that ensures no change in shade and intensity of colour even when exposed to high temperatures and light, making it ideal for baked goods, soups, sauces and confectionery.



# DESIGNED FOR PERFORMANCE

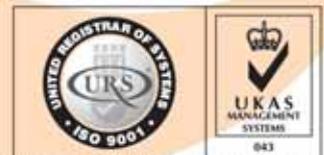
Our commitment to quality has driven us to draft a quality manual which has procedures listed out for checking all the components that go into the assembly of a filter. All filters & accessories offered by us are subjected to as many as 10 quality checks by qualified engineers/technicians. This ensures that these components indeed are designed for performance to the fullest satisfaction of the customer. This is in tune with our company's proclaimed objective stated in our Quality Management System.

Customer complaints (if any) are attended to on priority basis, feedback from the customers are recorded & monitored, which in turn helps us serve the customer better.

Get in touch with us for filtration systems which are truly 'DESIGNED FOR PERFORMANCE'™



**Kumar Process Consultants  
& Chemicals Pvt. Ltd.**



URS is a member of Registrar of Standards (Holdings) Ltd.

**An ISO 9001:2015 certified company**

**Clear solutions for your filtration problems since 1978**

4 & 5, Bhagtani Enclave, Sonapur Lane, Off. LBS Marg, Bhandup (W), Mumbai 400 078. INDIA. Tel./Fax: 91-22-4126 5126 (50 lines)  
Mobile: 90047 06047, 98923 12343. email: [info@kumarfilter.com](mailto:info@kumarfilter.com) [www.kumarfilter.com](http://www.kumarfilter.com)

# Widest range of **ETHNIC INDIAN FLAVOURS & SEASONINGS**

**Sonarome offer  
an exciting range of ethnic Indian flavours  
(Kulfi, Ras Malai, Mawa, Kheer, Gajar Halwa, Namkee Lassi,  
Gulab Jamun and many more )  
and extensive range of spice seasonings.**



  
**sonarome**  
India's No.1 flavour company

**Sonarome Private Limited**  
One Sonarome Way  
KIADB Industrial Area,  
Doddaballapur  
Bangalore 561 203 INDIA

**T** +91 80 3090 2200  
+91 80 3090 2288  
**F** +91 80 3090 2299  
sonarome@sonarome.com  
**www.sonarome.com**

Partners  
 **FRUTAROM**  
FOUNDED 1933

An ISO 22000, GMP, Halal & Kosher Certified Company.

*Your ingredient for success...!*

# Packaging Testing Equipment

Food ★ Pharma ★ FMCG



Box Compression Tester

Torque Tester



Ink Rub Tester



Moisture Meter



Tensile Tester

Leakage Tester



Thickness Gauge



Oxygen Analyser



Leak + Burst Tester



Pouch Compression Tester



Member



Pinhole Tester



Food Texture Analyser



Member



**Rohit Instruments & Testing Services**

K-1, 601/2&3, GIDC Ranoli, Vadodara - 391350. Email : [FMT@PACKTEST.com](mailto:FMT@PACKTEST.com)



# POWER IS LEADERSHIP

The first choice in geared motors, across 20 countries.

POWER IS RADICON POWERBUILD

- Trusted name with a legacy of 47+ years • Leaders in power transmission solutions
- World-class products • Over 1.5 million units performing across India and the world



**Series M**  
Helical Inline  
Geared Motor



**Series C**  
Heliworm  
Geared Motor



**Series F**  
Parallel Shaft  
Geared Motor



**Series K**  
Helibevel  
Geared Motor



**Series PL**  
Planetary  
Geared Motor



# Rohit Instruments & Testing Services, introduces 3 critical equipment for the Snack Food and Bakery Industry

## 1) HEADSPACE OXYGEN ANALYSER

Modified Atmosphere Packaging (MAP) is now used commonly to enhance the shelf life of food and pharmaceutical products that are sensitive to the presence of Oxygen or other gases.

Ambient air has 20.9% oxygen. MAP targets to flush out this air and bring down the O<sub>2</sub> level to under 1.5%. Presence of O<sub>2</sub> in excess of 2% can have a degrading effect in product stability and shelf life.

**Test Method:** A septum seal sticker is applied to the package and a needle is pushed through it. The gas inside is allowed to come out through the needle and is analysed by an Oxygen sensor. The instrument shows the O<sub>2</sub>% directly.



## 2) LEAK BURST TESTER

A very versatile testing equipment for a variety of test applications.

This machine can be operated in 3 test modes.

**Leak Test :** Your package is tested only for leakages.

**Burst Test:** Your package is tested only for burst pressure.

**Leak & Burst Test:** Your package is tested both for leakages and burst pressure.

### TEST METHOD:

**Leak Test :** Package is penetrated with a needle probe and internally pressurized upto a set pressure and held for a set time. System will automatically detect leakages by monitoring the pressure drop.

If the package is held under water, you will also see air bubbles from leak points.

**Burst Test:** Package is penetrated with a needle probe and internally pressurized until the sample bursts. The max burst pressure is displayed.



**LeakBurst Test:** Package is penetrated with a needle probe and internally pressurized upto a set pressure and held for a set time. System will automatically detect leakages by monitoring the pressure drop. If the package passes the leak test, the equipment automatically increases the internal pressure until the sample bursts and records the peak pressure at which the failure occurred.

## 3) FOOD TEXTURE ANALYSER

A very versatile testing equipment suitable to evaluate the texture properties of Bakery, Confectionary, Dairy and a wide variety of Food Products, Cosmetics, and Pharmaceuticals.

With a variety of test fixtures, you can test :

- Breaking Force (Crispiness) of Biscuits / Chocolates, etc
- Crushing Force (crunchiness) of Cornflakes
- Compression Force (Softness / Hardness) of Buns, Cupcakes, Candies, Pasta, etc
- Cutting Force of Cheese Block, etc
- Spreadability / Firmness of Jam, Yogurt, Cream Cheese, etc.
- and many more such tests.



### Contact :

Rohit Chawla

Rohit Instruments & Testing Services

K-1, 601/2&3, GIDC Ranoli, Vadodara - 391350.

Email : FMT@PACKTEST.com

## AAHAR 2020 KICKS OFF AT PRAGATI MAIDAN; TO COVER FOOD & ALLIED SECTORS

The 2020 essay of Aahar, the premier B2B (business-to-business) event of the India Trade Promotion Organisation (ITPO), commenced at Pragati Maidan, New Delhi, on Tuesday. One of the most awaited shows in Asia, it covers innovations and developments across all areas of the food and hospitality, supply chain, raw materials, processing, technologies, food safety and policy matters, packaging, filling and sealing, logistics track and trace, retailing and industry updates.

Inaugurating the event, L C Goyal, chairman and managing director, ITPO, said, "India has yet to realise its full potential exhibitions and conventions, and the future editions of specialised events such as Aahar would be organised with



unprecedented size and stature after the completion of the International Exhibition and Convention Centre (IECC) at Pragati Maidan."

He indicated that the event industry, which is worth about Rs 3 lakh crore, has a crucial role to achieve the target of a \$5-trillion economy

by the year 2024, as envisioned by India's Prime Minister, Narendra Modi.

Present on the occasion were Paban K Borthakur, chairman, APEDA; Rajesh Agrawal, executive director, ITPO; Dr S K Jindal, president, AIFPA; Amit Lohani, chairman, FIF; Arvind Khanna, vice-president, HOTREMAI, and Rajeev Sachdeva, vice-president, ARCHII, participants and delegates from India and abroad.

## ENERGY EFFICIENT MOVIGEAR® THAT DRIVES YOUR WORLD BEST!

**SEW**  
**EURODRIVE**  
Driving the world

Efficiency and functionality are the two pillars of SEW-EURODRIVE's design philosophy. And MOVIGEAR® is an excellent example of how we bring this philosophy to life.

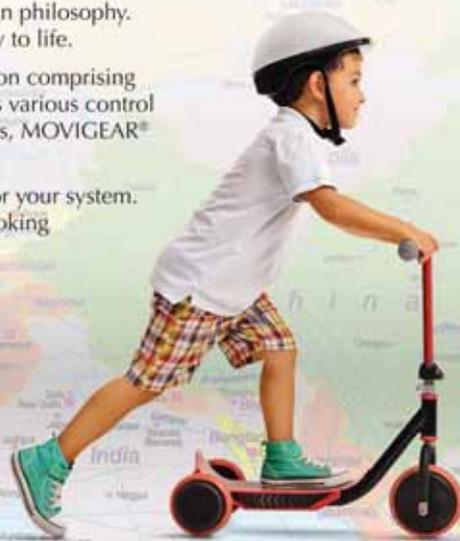
The MOVIGEAR® mechatronic drive system is an efficient all-in-one solution comprising motor, gear unit, and drive electronics. It is designed for flexible use across various control topologies. With its compact design and optimal integration of components, MOVIGEAR® is especially tailored for efficient use in conveying applications.

With MOVIGEAR®, it is possible to achieve energy savings of up to 50% for your system. Its practical flexibility and high efficiency make MOVIGEAR® a forward-looking solution – experience its exceptional performance for yourself!

To know more, do call us or visit our website.

### Range of applications

- Intralogistics
- Airport logistics
- Food and beverage industry
- Automotive industry



LEADER IN DRIVE ENGINEERING | MOTION CONTROL AUTOMATION EXPERT  
IN INDIA SINCE 1997 | OPERATING IN 50 COUNTRIES

+91 96866 24322 | Email : [marketing@seweurodriveindia.com](mailto:marketing@seweurodriveindia.com) | [www.seweurodriveindia.com](http://www.seweurodriveindia.com)



## Focus on exports can get better farm remuneration

■ By Dr. Shivendra Bajaj\*

India has the potential to become the biggest producer and exporter of farm commodities owing to agriculture being engrained in our way of life and the presence of diverse agro-climatic regions. The capability to fill a large food basket presents the country an advantage while competing in the international market. India with its agro-climatic zones and skilled farming community has an edge in the production of several agriculture products such as cereals, rice, milk, buffalo meat, fruits, vegetables, and seafood.

Dr Shivendra Bajaj, Executive Director, Federation of Seed Industry of India (FSII), said, the agricultural productivity for most crops is low in India in the global context, the farm production in India is still in surplus. However, the majority of production either is consumed at the domestic market or goes waste due to inadequate food storage and processing facilities.

The lucrative export market can guarantee an increase in farm income in a short time. Two years ago, the Agricultural and

Processed Food Products Export Development Authority (APEDA) had experimented with transporting Nendran Banana from South India to Dubai through water transport.

The move received positive results as it did not just make the fruit available to international customers at an affordable and cheaper rate but helped Indian farmers get better remuneration as well, states the report "Development of Sea Protocol for the Trial Sea Shipment of Traditional Nendran banana to Dubai". The report was prepared by

ICAR-National Research Centre for Banana and APEDA in 2017.

Similarly, the APEDA has tried to explore central Asia and other some South East Asian countries for markets for fruits from unexplored regions of India. These included chilies from Varanasi, china bananas from Bihar, mandarin orange from Arunachal Pradesh, pineapple from Tripura and banana from Akola, Maharashtra.

Many states or regions in India do not have proper post-harvest management facilities and strong transport connectivity, as well as farmers, lack awareness regarding the opportunities and benefits of export.

Local governments are more focused on providing farm inputs to farmers such as seeds, fertiliser for better crop output. However, there is a need to divert attention towards creating post-harvest management facilities such as packaging, grading and sorting – for making farmers aware of the quality requirements and their produce, particularly perishable items export-ready.

The challenge would be to transport export-oriented commodities from the areas with poor connectivity with the twin objectives of cost-effectiveness and fast delivery.

Air transport would ensure fast delivery so the freshness of

THE WATER TRANSPORT OPTION CAN BE CONSIDERED FOR THE EXPORTS TO COUNTRIES WITH SEAPORTS, AS THE FREIGHT COST IS SIX TIMES LOWER THAN THAT THROUGH AIR TRANSPORT. HOWEVER, IT MAY NOT BE HELPFUL IN THE CASE OF PERISHABLE COMMODITIES.

perishable items would remain intact but it would add substantially to the final cost – thus making commodities vulnerable in the cost-competitive global market.

The water transport option can be considered for the exports to countries with seaports, as the freight cost is six times lower than that through air transport. However, it may not be helpful in the case of perishable commodities.

In such cases, the food processing option can play a pivotal role as it has the capacity to ensure perishable items are quality controlled and not wasted. The food processing sector is still in the nascent stage and its contribution to national GDP is less than 2 percent.

According to APEDA, India is the second-largest producer of fruits and vegetables, which are highly suitable for export. However, the processing level is not more than 10 percent. It means India and its farmers are losing precious opportunities of earning foreign currency. Similarly, India is a leading producer of fish, dairy, cereals, meat and poultry. However, the amount goes to the export is quite low.

There is a need to set up a mechanism to synchronise production, processing and exports to boost farm income and the Indian economy alike. Thus, strategic investment is required to build the infrastructure related to transportation, storage, processing and thus creating momentum in the nation's food export.

Also, reforms in the APMC Act, adopting innovative technology, streamlining the standards for food safety norms and harmonization with international standards are among areas of key focus.

There are concerns about high tariff and duty rates, which often result in the non-competitiveness of Indian commodities. It needs to be revisited as well.

\* Author is Executive Director, Federation of Seed Industry of India (FSII)

**Russ Air**  
ENVIRONMENTS YOU TRUST

ISO 9001  
ISO 14001

GLOBAL LEADERS IN TECHNOLOGY

INDUSTRIAL AIR CURTAINS & AIR DOORS  
PVC STRIP CURTAINS & ROLLS  
INSECT KILLERS & ARRESTORS

Projects In Pharma | Food & Beverage | Cold Storages | Automotive | Chemical | Real Estate | Retail | Hospitality | Healthcare

Tel: +91 22 2600 7979 | +91 86 9191 2000 | Email: sales@russairtec.com | Web: www.russairtec.com

# Anti-oxidant Rich Foods

■ By Mr. Bridreth Khokhare\*

**H**ealth is a person's psychological, mental and physical condition. Healthy people are considered to be those who are free from illness and injuries. Good health is of prime importance for all individuals and a great deal of effort is required to stay healthy.

Due to excessive pollution in the environment around us and adulteration in the food that we consume, it is difficult to stay healthy without the help of specific nutritional foods or external nutritional supplements. Pollution leads to the production of reactive oxygen species in our body which damages biomolecules in our cell and tissues. These reactive species and free radicals consist of hydrogen peroxides, reactive oxygen species, superoxides, hydroxyl radicals, etc. Excessive production of these reactive species damages lipids, proteins, genetic material and leads to a plethora of diseases including cancer, atherosclerosis, Auto-immune disorders, chronic degenerative disease, rheumatoid arthritis, neurodegeneration and hypersensitivity.

To counter these free radicals & harmful reactive species our body requires free radical scavengers known as anti-oxidants. There are many food sources that are rich source in anti-oxidants. Few known anti-oxidants include glutathione, arginine, citrulline, taurine, creatine, selenium, zinc, vitamin E, vitamin C, beta carotene, Bio flavones, carotenoids and tea polyphenols, etc. Recently there has been growing



evidence that shows that intake of anti-oxidants and key traces mineral-rich food does reduce the oxidative stress of the body.

## INTRODUCTION

Our health defines our wellbeing and nutrition is key to a great healthy. Informative & adequate consumption of fruits, vegetables, herbs, Spices, Beverages, shrubs, cereal and nuts is important. Eating a variety of colorful foods with every meal is vital for boosting maximum Immunity. Red colored fruit and vegetables are a rich source of anthocyanins and

Lycopene. Bright orange and yellow colored foods are rich sources of Pro-vitamins. Green colored fruits and vegetables are a rich source of Chlorophylls & carotenoids. Blue & purple colored foods are a good source of anthocyanins and proanthocyanidins. Dark brown and black foods are rich sources of resveratrol & flavonoids.

**Fruits:** Fruits that are rich in anti-oxidants include Oranges, citrus fruits, berries, Pomegranates, Figs, Plums, apples, apricots, grapes, peaches, raspberries, strawberries, red currants, cherries, pears, guava, apricots, mango, watermelon, Kale etc. Regular consumption of fruits and berries may be responsible for delaying the decline in brain function that tends to happen with age. This may happen due to neutralizing harmful free radicals, reducing inflammation and boosting adaptive immunity.

VEGETABLES ARE  
EXCELLENT SOURCE  
OF INSOLUBLE FIBER  
KNOWN AS ROUGHAGE  
WHICH IS ESSENTIAL FOR  
DIGESTION AND PROPER  
BOWL MOVEMENT.



# COLORS FARMED WITH PASSION

## Natural Food Colours

Dairy, Confectionary, Savory, Fruit Juices, Ice-Creams,  
Cake decorations, Pharma syrups, Fruit Specialties, Bakery,  
Seasonings, Sorbets, Biscuit Creams, Desserts, Jams,  
Frozen Desserts, Snacks, Jelly Crystals, Alcoholic and  
nonalcoholic beverages, Soups and Sauces, Soft Drinks,  
Cereals.



**sonarome**  
India's No.1 flavour company

**Sonarome Private Limited**  
One Sonarome Way  
KIADB Industrial Area,  
Doddaballapur  
Bangalore 561 203 INDIA

**T** +91 80 3090 2200  
+91 80 3090 2288  
**F** +91 80 3090 2299  
sonarome@sonarome.com  
[www.sonarome.com](http://www.sonarome.com)

Partners  
**FRUTAROM**  
FOUNDED 1933

An ISO 22000, GMP, Halal & Kosher Certified Company.

*Your ingredient for success...!*

Additionally, fruits are good sources of many important minerals, vitamins, fibers and natural sugars. Few fruits a day can be of great health benefit. The antioxidants including polyphenols & anthocyanins have been shown to reduce risk factors for heart disease, lowering LDL cholesterol levels and blood pressure.

**Vegetables:** Dietary Vegetables provide the body, an added source of anti-oxidant to fight against free radicals. Major vegetables and cereals include barley, Broccoli, Tomato, Spinach. While Cruciferous vegetables are rich sources of indoles, chlorophyll and Carotenoids like Ferulic acid, carotenoids lutein, zeaxanthin and beta-carotene other Water rich red colored Vegetables are rich source of lycopene and vitamin C.

Vegetables are excellent source of insoluble fiber known as roughage which is essential for digestion and proper bowel movement. Without the necessary intake of healthy vegetables, free radicals can spread and eventually lead to various types of cancer.

**Cereals & Nuts:** Grain cereals include wheat, barley, maize, millets, rice, etc. whole-grain cereal provide a wide range of phytochemicals that has protective effects on metabolic health. The hydrolysable polyphenols, flavan-3-ols & tocopherols present in cereals have strong free-radical scavenging potential. Gastrointestinal digestion and fermentation of cereals in our stomach increase their antioxidant potentials.

Walnuts and natural dates are a rich source of important minerals and anti-oxidants like Anacardic acids are phenolic lipids. Walnut polyphenols had the best efficacy among the nuts and also the highest

lipoprotein-bound antioxidant activity. Regular Consumption of nuts has been shown to improve the lipid profile, increase endothelial function and reduce inflammation.

**Spices and Herbs:** Most of the species used in cooking are loaded with anti-oxidants and anti-cancerous. Spices like turmeric, cumin, ginger, Cardamom, Clove, mustard seeds, pepper, garlic, paprika, and onion contains actives like curcuminoids,

of anti-oxidants. Coffee, chocolate drinks, Cinnamon drink, black tea, ashwagandha tea, Green tea contains flavanols, Cinnamic acid hydrocinnamic acids, polyphenols, withanolides, flavonoids etc. Their strong anti-oxidants are very effective in compacting the free radical produced in our body.

When consumed in moderation, Wine and grain-made beer provide a healthy dose of anti-oxidants.

## SOME IMPORTANT ANTI-OXIDANTS AND ITS SOURCE

- Beta-carotene – Mangos, carrots, Parsley & spinach
- Vitamin C – Citrus fruits, berries, Mangoes, Spinach, Kiwi fruit & Broccoli.
- Vitamin E – vegetable oils (such as wheat germ oil), avocados, nuts, seeds and whole grains
- Catechins – Tea & strawberry
- Lutein – Green leafy vegetables like spinach
- Polyphenols – Green tea, cereals & Coffee
- Sulphur compounds - onions and garlic
- Anthocyanins – grapes and berries
- Flavonoids – Black tea, green tea, citrus fruits & red wine
- Indoles – cruciferous vegetables
- Isoflavonoids – Soybeans, peas & beans
- Lignans – sesame seeds & Brans
- Lycopene – Tomatoes
- Zeaxanthin, Astaxanthin & Fucoxanthin – algae & some plant

Gingerols, Eugenol, Piperine, Capsaicin, Allicin, quercetin, etc. These active has anti-bacterial, anti-fungal, anti-cancerous and very strong antioxidant properties. Regular consumption of these spices supports the body in compacting free radicals and fungal, viral, inflammatory diseases.

Herbs include basil, curry leaves, fenugreek, Coriander, peppermint, oregano, savory and dill weed. All of which provides a required flavor to the meal along with anti-oxidant.

**Beverages:** Beverages in both hot and cold forms are a good source

## CONCLUSION

Physical wellness is very important for being healthy. Food and the right nutrients play a key role in maintaining good health. Vegetables, nuts and fruits rich in antioxidants and micronutrients are required to stay healthy. Dark coloured foods are high in anti-oxidants and many important traces metals. A good choice to pick a platter is of coloured platter as different color vegetables or fruits contain a specific type of anti-oxidants.

\* Author is Chief Scientist at Science on Wheels

Our cones make  
everything better



HYDERABAD | COIMBATORE | AHMEDABAD



**Sales & Corporate Office**

Plot No. 10, IDA Uppal, Ramanthapur Main Road,  
Hyderabad 500 039, Telangana, India.  
Tel.: +91 40 2720 5293/ 94  
bigdrumindia@bigdrum.com  
www.bigdrumindia.com

Contact us today, for your free sample



# Tastes Differ in a Global Industry

With strategically located regional development centers, BENEО focuses on customer proximity and ensures that new product ideas convince with taste and market relevance

**B**uzzwords like “glocalization” and phrases like “think globally, act locally” are omnipresent. Indeed, one of the most widely asked questions of our time is: How can regional identities and cultural characteristics be preserved in a globalized world? In answering this, the food industry faces the challenge of combining global business activities with the right feel for differing regional needs and customs. To master this challenge, BENEО focuses on regional product development. At multiple sites around the world, food technologists work together with customers and partners on tailor-made concepts in the style of the region that meet the tastes of local consumers.

## TASTE – A VARIABLE WITH MANY FACETS

People’s taste preferences are being developed during the course of their lifetime and are directly related to their personal environment. There are some universal genetic predispositions in babies, such as a preference for sweet and an aversion

to sour and bitter flavors. But it is only when infants start eating adult foods that they develop their own particular preferences in terms of the taste, texture and appearance of food. Social, cultural and psychological influences in particular determine what, when and how food is eaten later in life. It is difficult to change this imprint retrospectively. Maggots as a source of protein, chicken’s feet or fermented herring? To the palate of the average Brit, for example, these dishes do not appeal.

Certain principles also apply to the finer sensory nuances of globally popular products: Texture, salt content, flavor combinations and sweetness profile – all of these variables can determine the success or failure of one and the same basic product in different regions. From their own personal travels, most people know that strawberry ice cream or chocolate taste different in the USA or Asia to how they do in Europe. In addition, there are regulatory requirements that define whether and how various ingredients can be used in individual cases.

## BENEО FOCUSES ON REGIONAL EXPERTISE

As one of the leading manufacturers of functional ingredients, BENEО understands how important sensory fine-tuning is in determining the success of a product. In 2011, the company established the BENEО-Technology Center to support customers in the development of products with technological or nutritional benefits. First and foremost, the company’s application technologists in Tienen, Belgium, and Offstein, Germany, ensure that everything from sugar-free chocolate and high-fiber crackers to meat-free Bolognese sauce and low-fat yoghurt are equal or even superior to their traditional alternatives in terms of taste, appearance and texture. To ensure that regional product and taste preferences are taken into account wherever possible, BENEО has opened further development centers around the world in recent years.

Rudy Wouters, Vice President BENEО- Technology Center, recalls: “The idea developed in the USA,



where we began construction of a regional application laboratory in 2011. It wasn't large, but it was big enough to enable us to adapt our product ideas from Europe to local tastes on site."

A BENE0 development center in Asia followed just one year later. Since 2012, food technologists in Singapore have been working on incorporating the company's functional ingredients into recipes in such a way that, in addition to any desired nutritional or technological benefits, the typical flavors of the country are emphasised. In the Asia-Pacific region especially, there are numerous products that Europeans are not even aware of. Without local experts, it is virtually impossible to define reference formulations and explore the potential for successful reformulations.

Rudy Wouters adds: "Our core business is the production and marketing of the functional carbohydrates Isomalt and Palatinose™, the prebiotic fibers inulin and oligofructose, as well as numerous ingredients derived from rice and, more recently, texturized wheat protein. The special thing about BENE0 is that we have developed all of these ingredients ourselves. So we know exactly how to get the best out of them. But we are neither a flavoring house nor a scientific research institute. That's why we work closely with other companies and with universities in various regions across the world to ensure that our product samples are convincing in all respects."

### FROM LABORATORY TO HIGH-TECH CENTER

What began in the USA with a small laboratory was raised to a new level in spring 2018: measuring 3000 square foot and equipped with state-of-the art technology, the BENE0 application center in



Parsippany, New Jersey, offers the best conditions for developing new product ideas for the North American market and putting them through their paces. A variety of versatile benchtop scale and pilot scale equipment allow local employees to manufacture and analyse a wide range of products. These include baked goods, classic and fermented dairy products, soups, sauces, frozen meals and various types of bars and beverages. Equipment is available for the analysis of rheology, particle size, pH value and freeze-thaw stability, enabling the technologists to optimize the use of BENE0 functional ingredients in different food matrices.

Not quite as large, but just as professionally equipped, is the newest development center. Operating in São Paulo since the end of 2018, this location completes the current network and means that BENE0 is even closer to its customers and their target groups not only in Europe, the Asia-Pacific region, the USA and Canada, but also in Latin America.

"Geographical and cultural proximity to customers naturally offers many advantages," continues Rudy Wouters. "We can respond more quickly and flexibly to individual needs. The market and product knowledge of our on-site colleagues ensures that our ideas and concepts are relevant. And if the customer should ever experience production

problems or require further optimization of formulations, we are nearby."

### SERVICE – FROM THE IDEA TO THE MARKETING

Application expertise is just one of the many building blocks of all BENE0 development centers – wherever they are located. The company also supports clients with market and consumer research, marketing as well as nutritional science and food legislation. The regulatory environment in particular has a decisive influence on which ingredients can be used in which applications, in which quantities and in which combinations. The same applies to claims based on health or nutritional information. Something that is common practice in the US or in Asia may, for instance, fall foul of European regulations – or vice versa. The BENE0-Institute combines expertise in this field and helps to ensure that regional product concepts meet all legal requirements.

BENE0 continues to consider further regional application centers in the future. All over the world, consumers are increasingly asking for products that contain less sugar, are "clean label" or contribute to intestinal health. In addition, more and more people are fighting obesity, diabetes and cardiovascular diseases. Foods that can make an active contribution to a healthy lifestyle while meeting consumer tastes expectations therefore hold great potential.

# Food Flavours: Understanding Food Additives

■ By Sweta Rai, Sabbu Sangeeta and Santoshi Rawat\*



Flavour is a sensory phenomenon which is a combination of the sensations of taste, odour or aroma, heat and cold, and texture or "mouthfeel". The appearance of food is important, but it is the flavor that ultimately determines its quality and acceptability. Natural flavouring materials such as spices, essential oils and fruit juices have been used for long in food preparations but as their supply has not kept up with the demand, with a consequent rise in their cost, natural flavouring agents have been largely substituted by synthetic ones. Thousands of these synthetic compounds are now being used as food additives. There are four basic tastes: salty, sweet, sour and bitter.

**Salty:** Sodium chloride is the only salt that has a pure salty taste. Besides imparting flavor to food, it

is also an essential nutrient. Other salts have different tastes, e.g., some iodides and bromides are bitter while some salts of lead and beryllium are sweet.

**Sugar:** Sugar is used more to impart sweetness than flavor to food. Fructose present in honey is the sweetest sugar followed by sucrose and glucose, whereas lactose in milk is slightly sweet and gives less flavour. Natural sweet compounds are generally polyhydroxy compounds with a straight-chain structure, such as sugars and the hexahydroxy cyclic alcohols, mannitol and sorbitol. Diverse compounds, such as saccharin, some peptides and cyclamates are also sweet.

**Sourness:** Sourness of food is due to the presence of organic acids of which citric, tartaric and malic

are the most common. Acetic acid produced by fermentation of alcohol is common in processed fruits. Ascorbic acid is abundantly present in fruits and vegetables. Oxalic acid found in spinach and phosphoric acid and its salts are often used in the food industry. Remarkably, the hydrogen ion is mainly responsible for sour taste. Except for oxalic acid, all other acids are weak acids and the degree of sourness is not proportionately related to the hydrogen ion concentration.

**Bitterness:** It may be due to alkaloids, glycosides, other classes of organic compounds as well as inorganic salts. Naringin the bitter principle of grapefruit is a glycoside of rutinose and is not toxic, while amygdalin, a glycoside present in bitter almonds contains gentiobiose and cyanide group, and it toxic. Mustard and horseradish contain the alkaloid

sinigrin, which is harmful and gives an off flavour. Quinine, strychnine, nicotine, etc., are bitter alkaloids. Caffeine, a constituent of coffee and tea, is bitter. Phenolic compounds like tannin and some flavonoids combine bitterness with astringency.

The flavor of any food depends upon minute quantities of 100 or more chemicals that are present in food. These flavoring components are present in concentrations ranging from a few ppm to 0.1 percent.

Classification of flavours:

- *Natural Flavours:* Herbs, Spices, Aromatic seeds, Fruits, Vegetables
- *Processed flavours:* Fermented, Baked, Toasted, Roasted, Caramelized
- *Added flavours:* These are two types:

a. Natural extracted flavours:

Essential oils: Clove oils

Essences: Vanilla

Extract: Yeast and Beef

b Synthetic Flavours:

Fruits flavours (blend of esters): Banana, peach, pineapple and vanillin

Savoury flavours: Chicken,

Onion and Smoked

Some plant produce flavours:

- *Herbs:* Basil, Parsley, celery, thyme, mint, etc.
- *Fruits:* Orange, lemon, apple, banana, strawberry, Pineapple, etc.
- *Spices:* Cardamon, clove, turmeric, peppercorns, etc.
- *Vegetables:* Mushrooms, corn, peas, onion, garlic, cabbage, turnips, etc.
- *Aromatic seeds:* Aniseed, cumin, fennel, dill, caraway, etc.

The aroma of onion, garlic, cabbage, etc. is mainly due to sulphur –

containing compounds. These vegetables should not be overcooked. Other flavouring components in vegetables are methanol, acetone, propanal, etc.

## FLAVOUR COMPOUNDS

The substances mainly responsible for the aroma of food products are volatile compounds. These may be aliphatic esters, aldehydes, or ketones and are present in fruit and other natural foods in very low concentration: many thousands of natural flavouring compounds are known and in any one food there may be hundreds of these present. Some of the important groups of flavouring compounds are as under:

- **Flavonoids:** Flavonoids are responsible for the flavor of many fruits, e.g., orange, lemon and grapefruit peels contain a



**A BREAKTHROUGH  
IN PACKAGING  
TECHNOLOGY**

**GT-5S**

**For enquiries, call +91 9811103573  
or visit [www.vspackit.com](http://www.vspackit.com)**

**PACKIT®**  
packs fresh packs fast

Made to perform, built to last, **GT-5S** is the next generation high speed continuous motion bagger from Packit. **GT-5S** is the logical choice when high speed packaging is required!

- Sturdy, versatile & compact
- Designed to run Pillow, Gusseted and Flat-bottom bags
- Quick change forming Tubes & Films rolls
- Speed up to 100 bags per minute
- Multi-axis (Trio) Motion Controls
- Panasonic Servo Motors
- No electrical or mechanical proprietary parts
- Operator friendly Program and Controls
- In-built temp couples
- Touch Control panel
- Electric reel including End of Film Alarm
- Tool-free adjustment
- Stainless steel Construction



Extremely sturdy & reliable



Enjoy quality assurance



Involves low maintenance



Comes with service guarantee



**V S INTERNATIONAL**

Plot 41 G DLF Industrial Area Phase 1, Faridabad 121003 IN  
T: +91 129 2259169  
E: [info@vspackit.com](mailto:info@vspackit.com)  
W: <http://www.vspackit.com>



number of flavanone glycosides. Among these, hesperidin (orange and lemon) and naringenin (grapefruit) are the most common. Hesperidin is quite tasteless, whereas naringenin has an extremely bitter taste.

- **Terpenoids:** Terpenoids are ubiquitous in plant foods. They are the major components of citrus oils and contribute to the flavor of citrus fruits. Limonene, a monoterpene hydrocarbon, possessing a lemon-like odour constitutes approximately 90 percent of most citrus oils. Naturally occurring oxygenated terpenes (mainly alcohols, aldehydes and ketones) provide the characteristic flavor of individual citrus species, e.g., neral and geranial of lemons and nootkatone (bicyclic sesquiterpene) of grapefruit.

In the presence of air or dissolved oxygen terpenes undergo structural changes and hydration, hence citrus juice concentrates prepared by low-temperature vacuum evaporation are superior in flavor than those processed at high temperatures. Juices of certain varieties of orange and grapefruit become bitter when kept at room temperature for some

time, due to the formation of the bitter limonin from its nonbitter precursor (limonin monolactone) by the action of the organic acids present in the juice. This can be prevented by removing the precursor by exposing the fruits to ethylene before juice extraction, or by the addition of a specific enzyme to the juice to degrade limonin.

- **Sulphur compounds:** Certain volatile sulphur – containing compounds possess powerful and distinctive odours which contribute to both the pleasant and unpleasant aroma of many foods, e.g., vegetables belonging to the genus *Allium* (onion, garlic) and *Brassica* (cabbage, cauliflower, Brussels sprouts, broccoli).

Vegetables of the *Brassica* family contain the sulphur compounds S-methylcysteine sulphoxide and thioglucosides. On cooking the vegetables, the former is converted into dimethyl sulphide which is partly responsible for odour. However, the predominant odour is that of the isothiocyanates formed from thioglucosides by enzymatic hydrolysis. This occurs only after rupturing of the cells when enzymes convert

the thioglucosides into the unstable thiohydroxamic-o-sulphate which too is unstable and undergoes spontaneous degradation to isothiocyanate.

The sulphur volatiles responsible for the odour of onion and garlic are not present as such in the intact vegetable tissue, but are formed rapidly when the tissue is ruptured by cutting or chewing, by the action of an enzyme on a precursor. The precursors and the enzyme are present in different cells of the tissue and come into contact only when the cells are ruptured. The precursors are cysteine sulphoxide derivatives which on enzymatic decomposition are converted into flavor compounds. The latter then undergo nonenzymatic degradation to more volatile compounds such as sulphides, disulphides and trisulphides.

The characteristic odour of garlic is due to allicin, which is formed from the odourless alliin (S-2 propenyl cysteine sulphoxide) by the action of the enzyme allinase. Allicin then undergoes nonenzymatic decomposition to disulphide and thiosulphinate. The disulphide further decomposes into a complex mixture of monosulphide and trisulphide.

The production of the volatile constituent of onion takes place similarly. Here the precursor S-1-propenyl cysteine sulphoxide is enzymatically cleaved to give propenyl sulphenic acid which is unstable and undergoes rearrangement to thiopropanal S-oxide, the lachrymatory factor in onion.

- **Other volatile components:** A number of other important volatile components contribute

to the aroma of foods. In terms of aroma, food can be classified into four groups, namely:

- (i) Those in which aroma is mainly due to one compound, e.g., banana (isopentyl acetate), orange (citral), almond (benzaldehyde);
- (ii) Those in which aroma is due to a mixture of a few compounds, of which one is the major component, e.g., apple (2-methyl butyrate and four minor components);
- (iii) Those in which aroma can be reproduced faithfully by the use of a large number of compounds, such as pineapple, walnut; and
- (iv) Those in which aroma cannot be reasonably reproduced by a mixture of specific compounds, e.g., strawberries, chocolate.

These volatile compounds can be classified into the following important groups:

- i. **Carbonyl compounds:** Acetaldehyde contributes to the odour of butter, hexanal to that of apples, benzaldehyde is responsible for the aroma of almonds, cherries and peaches and geranial for that of lemon. Amongst ketones, 2, 3-butanedione contributes to the aroma of butter, celery and some other foods. Acetophenone is responsible for the flavor of many foods.
- ii. **Acids:** Some acids have powerful odours. Acetic acid gives its characteristic odour to vinegar, and 2-methylbutyric acid to cranberries.
- iii. **Esters:** The aroma of fruits is also due to esters, e.g., pentyl valerate (apple), methyl salicylate (grape), pentyl acetate (banana), octyl acetate

(orange), ethyl butyrate (strawberry), butyl acetate (raspberry and strawberry).

- iv. **Hydroxy compounds:** Amongst alcohols, cis-3-hexen-1-ol (tomato and raspberry), 1-octen-3-ol (mushroom) and geosmin (dry beans and beetroot) are important.

Among the phenols, phenol itself contributes to the aroma of some cheeses. Vinyl guaiacol is present in many foods, eugenol is an important component of oil of cloves but is also widely distributed and thymol is responsible for the odour of tangerine.



### FLAVOUR ADDITIVES

In the case of certain flavours the substances responsible for them are difficult or impossible to isolate from natural sources such as strawberry, cherry and beans. These natural flavours have, therefore, to be imitated as far as possible by mixing a number of flavouring agents, natural and / or synthetic. The success of such imitation is more a matter of art than of science and is judged by the consumer preference for the flavoured product. Both essential oils and synthetic flavouring agents must be used in accordance with good manufacturing practice the salient points of which are:

- (i) The amount added shall not exceed that reasonably required

to accomplish the intended effect.

- (ii) Substances that may become part of the food as a result of manufacturing shall be kept as low as possible.
- (iii) The substance shall be of a good grade. Moreover, a flavouring agent may not be added to a food for which there is a standard, unless the standard includes it.

The following chemicals are used as flavor additives:

- **Monosodium glutamate (MSG):** It is commonly known as Chinese salt or aji-no-moto. Worldwide

used as flavor intensifier in soup, sauces, gravies, tastemakers and flourings, canned and frozen vegetables, meat, poultry and combination dishes. A level of 0.05-0.8% by weight in foods gives the best flavor enhancement and excessive use decreases the palatability of food. Under the PFA (Prevention of Food Adulteration) Act, MSG has been banned in foods meant for infants below 12 months of age, and should not exceed 1 percent weight in foods meant for adults.

- **Nucleotides:** Its flavor enhancers widely present in plant and animal cells. It is used in processed foods such as potato,

chips, peanuts, dry and canned soups, sauces, ketchups, sausages, canned vegetables and meat. The quantity of nucleotide added is very low. They are 50 to 100 times stronger than MSG.

- **Maltol:** It is used as a flavor enhancer for sweet flavours. It is found in several plants and is formed when cocoa, coffee and malt are roasted and in bread. It is synthesized from soya bean protein fermentation and is used as a fragrant, caramel like flavor for addition to fruit-based

products, ice cream, chocolates and candies. It imparts a 'freshly baked' flavor to bread and cake. It also used in cookies, beverages, instant pudding mix and soup mixes at levels ranging between 50-300ppm.

- **Salt:** Salt is used in food for its flavor, as a preservative and as a dietary constituent. The main role of salt in food is for salty taste, flavor intensification and as a digestive stimulant. It is used at 2 percent level.

- **Sodium restricted flavouring:** When salt is restricted on health grounds because of hypertension, oedema, kidney disorder, etc. the flavor of food can be improved by using herbs and spices such as pepper, dry mustard, paprika, lime juice, mint, celery, onion, ginger, garlic and bay leaf. Salt substitutes are salts which do not contain sodium but contain potassium or ammonium instead, such as potassium chloride and ammonium chloride.

- **Popular herbs and spices:**

Herbs	Description	Herbs	Description
Basil	Small leaves with pungent flavor	Ajwain	Small round seeds with sharp pungent taste
Bay leaf	Dried aromatic leaf of the laurel tree	Allspice	Berries with flavor of cloves, nutmeg, and cinnamon
		Aniseed	Seeds look like cumin and has delicately sweet liquorice aroma
		Star anise	Pretty star-shaped fruit with aniseed flavor
Chervil	Looks like parsley with delicate stem and soft, almost wilting leaves; has faint flavor	Asafetida	Strong – flavoured dried resin with strong smell
Chive	Tender green shoots with mild onion and scallion flavor	Cardamom	Black large pods and green small pods with pleasing warm aroma
Coriander/ cilantro	Looks like parsley; piquant taste and intense flavor with a fresh pungency	Chillies	Numerous varieties of dried ripened green chillies with varying degrees of pungency
Curry leaves	Long slender shiny dark green leaflets: strong warm spicy aroma curry flavor	Cinnamon	Delicate inner sweet and fragrant bark of small evergreen laurel-like trees
Dill	Fine feathery green stands with sweet aromatic flavor of caraway and lemon	Cloves	Dried unopened flower buds with a sweet pungent flavor and aroma
Fennel	Fine wispy leaves with mild aniseed and dill flavor	Coriander seeds	Yellowish brown round light seeds with pleasant flavor
Horseradish	Long tapering root with powerful smell and fiery taste	Cumin and caraway seeds	Caraway seeds are smaller new moon-shaped seeds resembling cumin; pungent, sharp, and astringent tasting seed
Kaffir lime leaf	Looks like bay leaf but fresh, green and smaller with aromatic lime flavor		
Lemon grass	Pale green long sturdy leaves with distinct lemony flavor	Fennel seeds	Sweet aniseed-like flavor
Marjoram	Similar to oregano but slightly sweeter flavor and a sweet, almost perfumed aroma	Fenugreek seeds	Small aromatic curry flavoured hard beige-coloured seeds
Mint	Leaves of spearmint plant containing peppermint oil	Galangal	Galangal is similar to ginger
Oregano	Wild variety of marjoram with a stronger flavor; warm aroma and pleasant slightly musty flavor	Garlic	Bulb with characteristic flavor of diallyl disulphide and high medicinal value
Parsley	Refreshing flavor with grassy undertones	Kokum	Dried sour fruit rich in anthocyanin

# ...cleaning agents? no problem with iglidur!



[www.igus.in/packaging](http://www.igus.in/packaging)

igidur® J

igus® offers: no lubrication...  
dry running... no corrosion...  
no rattling (low noise)... low  
weight... good resistance to  
dirt and dust... special parts  
and special solutions... easy  
assembly... cost effective...

**igus.in/packaging**  Delivered in 24 h or today

igus® (India) Pvt. Ltd.  
36/1, Sy. No. 17/3  
Euro School Road

Dodda Nekkundi Industrial Area - 2nd Stage  
Mahadevapura, Bangalore -560048,  
Karnataka, India

info@igus.in  
Phone +91-80-45 12 78-00  
Fax +91-80-45 12 78-02  
[www.igus.in](http://www.igus.in)

The terms "igus, iglidur, plastics for longer life, drylin" are legally protected trademarks in the Federal Republic of Germany and in case also in foreign countries.

Rosemary	Narrow spiky leaves with a fragrant evergreen smell	Ginger	Rhizome or root with sharp burning sensory stimulation, used fresh or dried.
Sage	Pale green leaves with earthy flavor	Mace and nutmeg	Mace is the outermost covering of the nutmeg fruit while nutmeg is the fruit; both have aromatic sweet and warm flavor
Tarragon	Slender leaves with intense sweet aniseed/vanilla flavor	Mango powder	Substitute for tamarind and lime
Thyme	Tiny greenish grey petals with pungent earthy flavor	Mustard seeds	Hot pungent taste, small round black, brown and yellow seeds
Wasabi	Root with delicate apple-green flesh; f flavor milder than horseradish	Pepper	Dried pungent small round berries, black, red, green and white in colour; also classified as condiment
		Pomegranate seeds	Dried seeds of fruit with sharp sour taste used for sourness
		Saffron	Stigmas of a crocus which are dried and used for distinctive flavor and bright yellow colour; very expensive spice.
		Tamarind	Sour, fruity flavor, brown bean-like seed pod
		Turmeric	Rhizome with bright yellow colour used in curry powder

## • Some flavours in food

Natural flavours	
Foodstuff	Principal flavoring agent
Mint	Menthol
Thyme	Thymol
Cloves	Eugenol
Pepper	Piperidine
Butter	Diacetal
Orange	Limonene
Lemon	Citral
Garlic	Diallyl disulfide
Turmeric	Curcumin
Synthetic fruit flavours	
Flavor	Chemical (mixtures of esters and alcohols)
Banana	Ethyl butyrate + amyl acetate
Peach	Benzaldehyde, benzyl alcohol
Apple	Ethyl acetate
Pineapple	Pentyl acetate
Strawberries	Methyl and ethyl acetates propionates and butyrates
Flavor enhancers	
Foodstuff	Flavouring compound
Chicken soup	Monosodium glutamate
Mushrooms	Nucleotides, i.e., GMP Disodium 5-guanylate

## • Taste components in fruits and vegetables

Taste	Substance
Sweet	Glucose, galactose, fructose, ribose, arabinose, and xylose
Bitter	Quinine-like compounds
Sour	Organic acids such as citric, tartaric, oxalic, malic, isocitric, succinic acid, etc.
Salty	Small amount of salt

Food flavours and food additives play a very important role in the industries to prevent the food from deterioration as well as human needs and desires is increasing. By using additives there are several benefits by which at least in the off-season we can get any foodstuffs and by adding the flavour we can get the desirable flavours in the food. As consumer's demands will increase to the food worldwide as the benefit will be an increase in the industries which is directly proportional to the increase in the national economy. The ultimate benefits we are getting to prevent food from microbial and other deterioration, as well as the harmful losses, is happening to human health. Increasing concentration of any food additives is directly proportional to the diseases in humans that is why there is some food testing agencies are involved to fulfill the criteria to make the food standard by analysis of food nutrients and the presence of food additives.

\* Sweta Rai and Sabbu Sangeeta are Asst. Professor Department of Food Science & Technology College of Agriculture, GB Pant University  
Santoshi Rawat is Msc. Student in Food Science and Technology at G.B Pant University

**FEATURES**

CAPACITY : 500LTR/HR,1000LTR/HR,2000LTR/HR, 5000 LTR/HR  
4000 TO 8000 BOTTLES PER HOUR FOR 500ML

With our compact sugar syrup making skid we can produce high quality sugar syrup which is basic ingredient for any Carbonated and non carbonated beverages and capacity range is 500 to 10000 lit per hour.

- Automatically regulated fill tank level for the product blending.
- Pasteurisation systems are used for pasteurisation and sterilization of fruit and vegetable juices and concentrates.
- The CIP station is designed for cleaning facilities, devices and pipelines on production lines according to the CIP (Clean In Place) method where hygiene is a top priority.
- The bottling line is designed for efficient performance in filling, sealing and labelling pet bottles that are used for juice.
- The whole processing line was controlled by PLC system with visualisation technology.
- Sturdy nozzles and grippers.
- Reliable quality capping heads.
- We provide a comprehensive range of services right from processing, storage, transport and packing of various kinds of shape in order to offering the specific juice with original nutrition, colour, and flavour of the fruit.

Our company can offer complete line for both carbonated and non carbonated beverages. The fruit juice hot fill production line is widely applicable to produce Apple, Blueberry, Orange, Pineapple, Mango, Lemon, Cherry, Prune, Cranberry, Carrot, Kiwi, Peach, Pear, Strawberry juice, etc. Carbonated beverage with and without 5-8 % fruit juice can be produce with our latest new skid mounted and factory assembled and fully automated and recipe based system.

For Further details contact :  
**NIHIRA FOOD ENGINEERING LLP**

Plot no 185, sector no 07, PCNTDA, BHOSARI, PUNE. 411026

Contact : 9767514222 | Email : santoshkarale@yahoo.com | Web: www.nihira.in



**VITAMIN PREMIX FOR FLOUR FORTIFICATION**



**H K ADDITIVES & INGREDIENTS -VASAI**

**IMPROVERS**

BREAD ( PAV / BUNS / SLICE PAV / BUNS RUSKS / PIZZA ) CUSTOMISE  
BISCUITS ( CREAMY / FLAVOURED / CRISPY / KHARI SPECIAL/  
SALTY TYPE BISCUITS)  
CAKE( SOFTNER / PREMIX / EGE REPLACER / CUP CAKE) CHAMPS

FOOD (CHAPATI / NAN / PARATHA / ROTI / NOODLE)  
FLOUR MILL ( MAIDA / BESAN /SOYA / CHAKKI ATTA /  
ANY FLOUR) INSTANT FOOD, ICE CREAMS, WAFFLES.  
FLOUR WHITENER (BENZOYL PEROXIDE) : 28% / 32% / 34% /  
50% / 75% / 85% / 92%

**OTHER PRODUCTS**

ADDITIVES ( JUICE / SYRUPS / JAM / PICKLES / KETCHUPS)  
BAKING POWDE R (STANDARD / SINGLE ACTING / DOUBLE ACTING /  
BROWNI MIX EGGFREE  
CHOUX PASTE -MIX-ECLAIRS  
CHOCOLATE CAKE MIX EGGFREE  
ENZYMES (VARIOUS BLENDS OF ENZYMES)  
EGGFREE WAFFLE MIX ( VANILLA / CHOCOLATE /  
RED VELVET / SEVERY )

EGGFREE MINI PANCAKE MIX (VANILLA )  
EGGFREE CUP CAKE- CONC.  
FLOUR WHITENER / BRIGHTNER / BLEACHER  
MUFFINS MIX -EGG & EGGFREE / CHOCOLATE / VANILLA  
PREMIX (FOOD / BAKERY / FLOUR ) / FLOUR FORTIFICATION  
PLUM CAKE MIX WITH EGG / EGGFREE  
PIZZA BREAD IMPROVER  
STABILIZERS ( ICE CREAM / BEVERAGES / BAKERY)

**NEW RANGE OF PRODUCTS**



- Standard
- Silver
- Golden
- Diamond
- Platinum
- Classic

**WHEAT GLUTEN  
GUAR GUM  
CMC SODIUM  
CALCIUM PROPIONATE**

NOTE: ALL THE PRODUCTS ARE BROMATE FREE  
FEATURE : ADDITIONAL BLENDING FACILITY ON JOB WORK



**CHEMICALS FOR VITAMIN PREMIX FOR NUTRITION PRODUCTS**

# Automation in the Food Industry

■ By Sudhanshu Chaubey\*

The automation of manufacturing food has been actively pursued for more than 50 years. And it will continue to be so, even more aggressively, during the next 50 years.

The increased zeal in industrial automation is mainly due to the explosive growth in computer hardware and software technology. As computers invade almost every aspect of our daily lives, the public at large has come to expect a high level of automation in every facet of the manufacturing processes. The extent of industrial automation depends a great deal on the type of industry. The automobile and semiconductor industries represent the most mature in adopting plant automation principles with nearly all processes having been automated and fairly well integrated. At the other end of the spectrum is perhaps the food industry, representing lower levels of automation, which has traditionally lagged in adopting technological advances. There are many reasons for this lack of uptake and this article will initially discuss the factors that make automation of food production so essential and at the same time consider counter influences that have prevented this automation uptake. The current level of automation in the food industry has been described as "islands of automation."

Highly competitive retailers constantly squeezing down prices, rising raw material costs and soaring utility charges in a labor-intensive manufacturing environment; why shouldn't food manufacturers



look towards automating their manufacturing processes? Automating food production can obtain many benefits. The ability to replicate the appearance and quality of a product with the minimum use of ingredients not only improve line efficiencies leading to bottom-line profit but also can potentially increase sales. At the same time, improving the traceability of raw ingredients will provide the added benefit of improved food safety.

Factory-based food production and processing globally form one of the largest economic and employment sectors. Within it, current automation and engineering practice are highly variable, ranging from completely manual operations to the use of the most advanced manufacturing systems. Yet overall there is a general lagging the use of automation technology compared with other industries. In particular, the article will focus on the diversity of an industry covering areas such as bakery, dairy, confectionery, snacks, meat, poultry, seafood, produce, sauce/condiments, frozen, and refrigerated products, which means that generic solutions are often (considered by the industry) difficult or impossible to obtain. almost completely generic, such as labeling, quality/safety automation, and palletization, and others

that do require an almost unique approach due to the natural and highly variable features of food products. In considering these needs, this chapter has, therefore, approached the specific automation requirements of food production from two perspectives. Firstly, it will be shown that in many cases there are generic automation solutions that could be valuably used across the industry ranging from small cottage facilities to large multinational manufacturers. Examples of generic types of automation well suited across the industry will be provided. Besides, for some very specific difficult handling operations, customized solutions will be shown to give opportunities to study the problems/risks/demands associated with food handling and to provide an insight into the solution, thereby demonstrating that in most instances the difficult/impossible can indeed be achieved.

## PAST, PRESENT AND FUTURE

If there is one industry that we just cannot do without, it has to be the food industry. Today's food processing and packaging are so much different, and the efficiency bar has been raised much higher. Automation has taken over where humans were once commonplace. Industry decision-makers know that plant systems must constantly evolve

to meet consumer requirements/demands. This means upgrading existing equipment or purchasing new equipment. That can be a huge challenge when the cost of a square foot of a food plant is so expensive and fixed base cost is considerable. The decisions of how to proceed may not be easy but aren't an impossible industry.

You will find a variety of different machinery including automated ovens, cutting and forming machines, sortation equipment, mixers, and blending machines, filling equipment, wrapping equipment, and as many robots as a highly automated automotive assembly line. Automation is now a necessity in the food industry to address the required levels of quality control, production speed, labor

shortages, and overall profitability.

Manufacturers are well aware of the challenges today and tomorrow, developing new and innovative products to automate every process possible. jobs in food processing will continue to shift away from manual labor, where workers sit along the side of a conveyor picking, sorting and packaging food items, to operators that monitor the processes in a control room with an eye on equipment speed, efficiency and quality control. However, the food industry is not an industry that can run in the dark – it will always require human intervention. Available labor in the food processing industry will continue to be one of the greatest challenges, driving even more need for automation ... beginning with harvesting and moving right on

through the supply chain, even down to the way the products are delivered to the restaurants that prepare the food or the consumers' home and kitchen. Automation will not replace people but will improve the skills workers need to keep up with the pace of change. New demands in the skill sets of food processing workers will require a higher level of training to meet the machinery production capabilities. No matter the type of product or the way it is packaged, automation has found its way into the process of the food industry. At the end of the day, plant floor automation is good for the food processing industry – keeping costs down and food quality up.

\* Author is a trainee at G.B Pant University in Button Mushroom Production & Hydroponics



## PREMADE SPOUT POUCH FILLING AND CAPPING MACHINE

Nihira Food Engineering LLP, based in Engineering hub of PUNE manufacturing of Packaging machineries for food Products, pharmaceutical and cosmetics, aim to provide localized solutions to Packaging Industries. The newly developed Premade spouted Pouch filling and capping machines having various model like

1. Linear two head spout pouch servo filling and capping machine
2. Fully Automatic Servo type premade spouted pouch filling and capping machine.



For Further details contact :  
NIHIRA FOOD ENGINEERING LLP

Plot no 185, sector no 07, PCNTDA, BHOSARI, PUNE. 411026

Contact : 9767514222 | Email : santoshkarale@yahoo.com | Web: www.nihira.in

# The Perfect Form for the Bakery

Dividing of dough and product processing combined into one production process

There are no limits to versatility: from whole grain, pizza or shortbread dough, up to fine-pored toast bread and marzipan – flexible solutions by VEMAG Maschinenbau GmbH fulfil any wish in the bakery segment.

Dividing and portioning of dough and consequent product processing are the main focus and the know-how of the long-established company, customer satisfaction lying at its core.

Number one priority for VEMAG, whose tailor-made solutions guarantee wide-ranging product creations, is to manufacture a perfect product for the end consumer. Handling dough yield of 145 up to 220, the dough dividers reach an otherwise unrivalled scope of product diversity.

The machines run without cutting oil, thus improving the product

quality, minimizing the costs as well as cleaning and retooling time. Record output values, e.g. 320 portions per minute for pizza dough balls, 400 grams each, produced with the dough divider VDP230, are highly unique in the industry. Doughs and masses, containing coarse particles and fillings, are divided carefully and accurately to the gram, product characteristics retained. Even solid masses for fruit and protein bars, fondant and sticky doughs are portioned precisely and brought into form.

## TECHNICAL ALL-ROUNDERS

Innovative technologies enable VEMAG dough dividers to produce super soft sandwich breads, as well as fine-pored toast and white breads, with an optimal crumb and perfectly voluminous. Natural fluctuations of protein amount are compensated and affect end product less. Even manufacturing of filled products has

been made possible with suitable attachments by VEMAG: the classic dough divider can be turned into a co-extruding system solution in a few easy steps.

## COST OPTIMIZATION THROUGH WEIGHT ACCURACY

Exact and accurate portioning guarantees less giveaway as well as increase in return on investment. The rotating double chamber system plays the significant role offering no weight limitations, thus, making it a flexible principle for dough portioning of any type.

Weight adjustments with a 0,1g scale can be freely selected via a display, which means no mechanical modifications for dividing and portioning are required. The product changeover and the associated interim cleaning are reduced to a minimum thanks to a first-class hygienic concept. Eventually, short





### PRODUCT SAFETY AND DEPENDABILITY

Plastic components, such as dough knives, along with any stainless steel part in contact with the product, are easily detected, in order to avoid product contamination and recalls. Any dough contacting part is easily accessible: quick cleaning with water and common detergents is a standard for all VEMAG machines

and its components. At any time, VEMAG dough dividers may be integrated into existing or planned production lines in an easy way.

Shaped by dependability, flexibility, ability to produce according to plan, as well as utmost hygienic standards, VEMAG solutions guarantee smooth operation in the bakery and facilitate optimum production process.

changeover times and higher machine availability contribute to a demand-driven production.

A wide range of modular attachments ensure that the dough divider is used flexibly and seasonally, adjusting itself to any output or product type.



## Juice up your beverage business

with turnkey beverage processing system from the leader...

### Turnkey processing system with a wide range of advantages

HRS Process Systems as a leading name in heat transfer solutions and food processing systems offers globally acclaimed standard technology for beverage industry. With superior quality and impeccable service support, it is an oblivious choice for any beverage processing plant.



**Turnkey Beverage Lines includes :**  
 Sugar Syrup Preparations  
 Beverage Blending  
 Homogenizer  
 Sterilizer along with integrated CIP System.

**Features & Advantages :**  
 Compact size so less floor requirement  
 Energy recovery upto 90% depending on type of beverage  
 Retention of natural product color, flavor and nutrients with increased shelf life  
 Extended production cycles with minimal product losses  
 Faster and efficient cleaning



# Accelerated Shelf-life Testing - A basic understanding

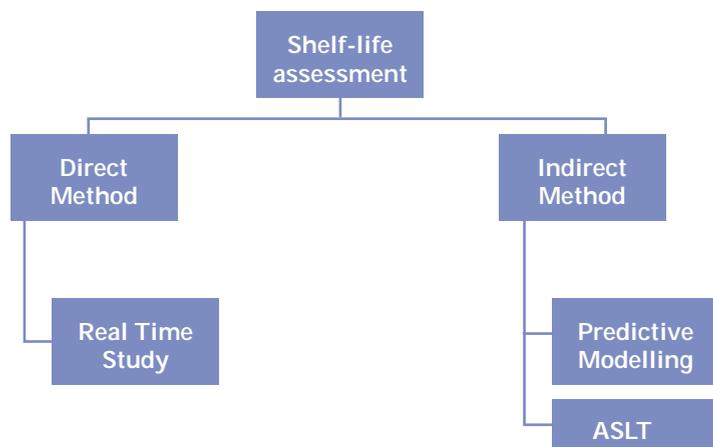
■ By M. Salman Chukkan\*

**F**ood and Agriculture Organization has defined Shelf-life as “The period during which the product maintains its microbiological safety, regulatory Compliance and sensory qualities at specific storage temperature.” Shelf-life of a product can be determined by taking Microbial conditions (Usually followed for Meat and meat products) or Sensorial attributes (Most of the food products) and analytical parameters like Vitamins or bioactive (In any foods with vitamin and bioactive compounds also claimed).



Factors affecting Shelf-life	Remarks
Product Formula	Dry Ingredients increases the shelf-life.
Product Shape & Size	More the surface area less the shelf-life.
Processing Method	Some Processing methods can remove more microorganism
Storage Condition & Supply chain	If the storage conditions are violated the shelf-life can get reduced.
Packaging	Less the Water Vapour Transmission Rate & Oxygen Transmission Rate higher the shelf-life.

Shelf-life assessment can be done by two different methods. They are Direct Method and Indirect Method. The direct method is having the assessment in real-time study, i.e. we keep the sample in ambient condition and take sample at respective intervals and have the sensory evaluation and the analysis. Whereas the Indirect Method has Predictive Modelling and Accelerated Shelf-life Test (ASLT).



## ACCELERATED SHELF-LIFE TEST

Real Time assessment is usually time and resource consuming. The food industry has a great need to have a shelf-life test in the minimum time possible because of the fierce competition, sudden shortage of agricultural inputs, opportunity loss and low unit value of the commodity. ASLT is a form Shelf-life assessment in which the stability or quality of the product is found out by keeping the sample in elevated conditions. By this, the deterioration rate is

increased which effectively reduced the time of assessment. The ASLT method was first introduced to the pharmaceutical product which was later adopted in food. Moreover, the use of ASLT can help to reformulate the product in-house to check the shelf-life extension. Or even the change of process and its effect on the shelf-life can be explored. ASLT can be applied to any deterioration that follows any order of the kinetic model. The process can be Chemical, Biochemical, Microbiological and Physical deterioration.

ASLT can be classified as two, based on the number factors used. They are Single factor ASLT and Multiple factor ASLT. Factor means any condition like temperature, pH or RH. In Single factor ASLT, we follow any one condition.

Here we are discussing Single factor ASLT. It is characterized by deliberately increasing the temperature or pH or Humidity to increase the deterioration rate. In ASLT, 'For every 10 °C rise, the rate of reaction is doubled'- this concept is called Q10 which is derived from Arrhenius equation. Arrhenius equation relates to the temperature dependence of reactions.

$$K = K_0 e^{(-E_a/RT)}$$

Where K<sub>0</sub> is constant, E<sub>a</sub> the energy of activation, R the gas constant, K rate of reaction and T absolute temperature. As this model is utilized in most of the case, the value of activation energy is readily available. To simplify the calculation process, one can get over the need to find the K<sub>0</sub> by taking a ratio for any arbitrary value. But usually, it is done for 10 °C, thus the Q<sub>10</sub>.

$$Q_{10} = \left(\frac{K_2}{K_1}\right)^{\left(\frac{10}{\Delta T}\right)}$$

Where K<sub>1</sub> is the initial reaction rate, K<sub>2</sub> the reaction rate of 10 °C elevated temperature, ΔT is the difference of elevated temperature and desired storage temperature.

$$\text{Accelerated Aging Rate (AAR)} = Q_{10}^{\left(\frac{\Delta T}{10}\right)}$$

$$DRT = AAR \cdot AATD$$

DRT is desired real time or shelf-life of the product under normal storage condition, AATD is Accelerated Aging Time Duration is the number of days where the product is stable at the elevated condition (ASLT).

#### GUIDELINES TO PERFORM ASLT:

##### Pre-requisites for ASLT:

- Define the critical Analytical parameter (like Vitamin C, Moisture content etc- Based on product the parameters vary), key Sensory attributes and Microbial specifications.
- Obtain a required amount of representative sample for the test.
- Keep some samples for Real Time study (Keeping samples at normal conditions- just to compare)
- Set up the frequency of sample collection.
- Run the Test.

##### Stage 1: Determining the basic data of unpacked product

1. Find out the Initial Moisture content (IMC) of the product by using the Oven Drying Method. IMC is nothing but the actual moisture content of the product
2. Expose the product to Accelerated conditions in the humidity cabinet to determine the Critical Moisture Content (CMC) of the product. (Note: Accelerated condition means Temperature usually 10-13 °C above the normal storage temperature of the product and RH 90% because microbial growth

is maximum observed, CMC is the moisture content at which the product is unacceptable)

3. By using IMC & CMC we can find the maximum permissible moisture in the product. Based on this data we can select suitable packaging material for the product.

##### Stage 2: Determine the AATD (Accelerated Aging Time Duration) of the packaged product

As mentioned before, AATD is the number of days where the product is stable at the elevated condition (ASLT).

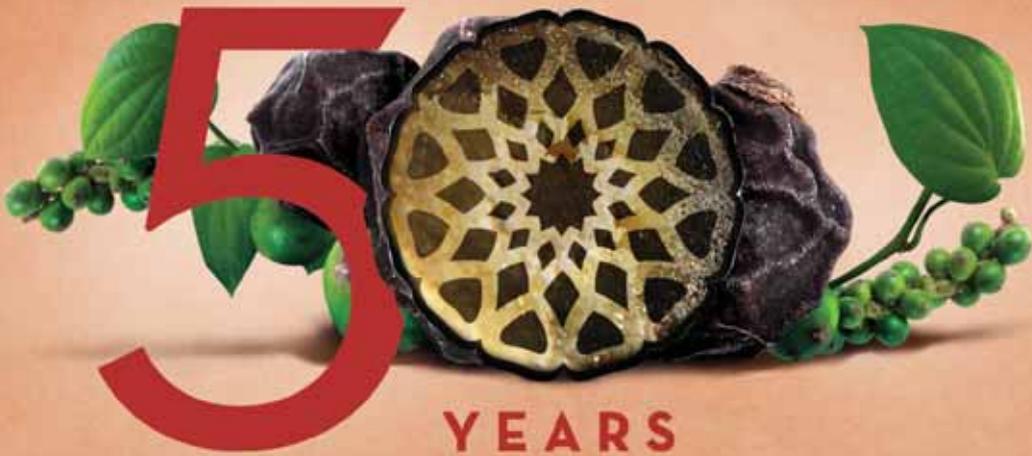
1. Load the representative sample into a humidity cabinet.
2. Collect the sample based on the frequency determined earlier.
3. Simultaneously conduct all the defined analytical tests, Microbial enumeration as well as sensory evaluation (Test parameters varies from product to product) along with the reaction rate (K<sub>2</sub>) to determine the Q<sub>10</sub> value.
4. Record all the observations.
5. Now continue the same till the product fails (It can be due to sensorial attributes or Microbial load or any other parameter)
6. Now get the average of all the Q<sub>10</sub>.
7. Now calculate AAR from Q<sub>10</sub> value.
8. Now AATD is determined.
9. Desired Real Time is also determined from the equation as mentioned above. This will be the number of days.
10. Conclusion of ASLT.

\* M. Salman Chukkan, M.Tech, final year, Food Engineering and Technology, Institute of Chemical Technology, Mumbai

WE  
CAPTURE  
WHAT  
MOVES



KANCOR



YEARS  
*of*  
BRINGING  
YOU THE  
BEST FROM  
NATURE.

The natural choice  
for all of your  
ingredient solutions.

## Kancor embarks on major expansion in Golden Jubilee year

Kancor Ingredients Ltd., a pioneer in the field of global spice extracts, has embarked on a major expansion spree in its golden jubilee year. Established in 1969, the company has already drawn up a three-year-long expansion plan. Kancor Ingredients, now part of France-based Mane Group, one of the largest flavour and fragrance companies in the world, has already invested over Rs 125 cr in the last four years and will invest over Rs 150 crores in the next 36 months for the expansion of existing manufacturing facilities and setting up new facilities and incorporating new technologies.

As per the plan, Kochi-headquartered Kancor Ingredients will continue the expansion of its facilities located in Kerala, Karnataka and Uttar Pradesh. In Karnataka, the company is planning to set up an additional facility adjacent to the existing facility at Byadgi. The company is currently in the process of acquiring around 50 acres of land for setting up a new processing centre. It will act as the major processing centre of Kancor for the next 25-30 years. The company, which has two facilities in Bareilly, Uttar Pradesh, has also started the process of expanding both facilities. In the home state, the facility at Angamaly is all set to undergo a major revamp with focus on R&D and new products. It will take three years for the completion of the projects.

Addressing a media conference on 13th Feb, 2020 at Kochi, Geemon Korah, CEO and Director, Kancor Ingredients Ltd., said, "We carry out major expansion activities in every 10-12 years with a vision for the next 20 years. The last time we carried out a major expansion was in 2004-2005. However, this time we have planned it with a vision for the next 25 years and made it part of the Golden Jubilee celebrations. It is our gift to our employees, stake holders and business partners. At present, all our facilities are operating at their fullest capacities."

Every decade, Geemon Korah said, "New challenges emerge in terms of emerging technology, business outlook, consumer behaviours and crop outputs. In every phase, Kancor has led the way by doing things differently. In 1969-70, Kancor was the first company to set up a spice extraction unit in India. It brought out a sea of changes in the spice industry and motivated the industry to focus more on value addition. When it comes to food safety, we were among the first to obtain ISO certification in 1994. At every stage, we have increased our capabilities in terms of technology and products to keep up with the times. We will continue to do so in future," he said.

"The company's success lies in the unyielding commitment to excellence. Right from the global sourcing programmes, we ensure that they work closely with the farmers to enrich their work and livelihoods. The initiatives of backward integration for specific crops and community development have already provided very positive responses," said Geemon Korah. He added that "The sense of commitment continues in the facilities, where state-of-the-art plants deal with the delicate and intricate processes of extraction, distillation and the purification of actives. Our R&D division tirelessly



innovates to fulfill complex orders from varied industry segments. We are pioneers in the development of several products, be it the isolation of Curcumin from turmeric in 1978, product advancements made in the field of natural colours and natural antioxidants. Kancor has contributed significantly to the industry," he said. "The acclaims and awards won by Kancor is a testimony to our commitment and spirit to bring the best to the world" Geemon added.

In terms of employee welfare, the attrition rate at Kancor, which currently employs over 600 people, is less than half the industry average of 9-10%. The company has launched numerous initiatives for the welfare of its employees and has developed a mutually beneficial association with the workers' unions for higher productivity.

In and around mint farms in UP around Bareilly, the company is involved in many sustainable agro initiatives to improve the yield of mint and thereby improving farm incomes. Several other agro initiatives taken up for the promotion of crops like Chillies, Rosemary, Ginger, Turmeric, Lemongrass and Tuberose are done with IT enabled services. The key focus of the Agriculture Business division is to assist farmers to adopt Good Agricultural Practices (GAP) with a special focus on Sustainability and Traceability, thereby improving their social, environmental and economic conditions. Over the years, Kancor has launched many Corporate Social Responsibility (CSR) programmes, which include lighting of villages, clean drinking water plants, unique initiatives for supporting farmers' families, health and sanitation, special education and employment enhancing vocational skills especially among children, women, elderly persons and differently abled persons.

### About Kancor Ingredients Ltd.

Kancor Ingredients Limited, whose roots in the spice trade can be traced back to 1857 at the spice capital of the world, Kochi, is a pioneer in the field of Spice Extracts and now is diversified into Natural solutions. Kancor Ingredients is headquartered in Kerala, India and has been a subsidiary of leading French Flavour and Fragrance house, Mane since December 2014.

Get your Spices Sterilized at our state-of-the-art plant of INDIA

**GUARANTEED LESS THAN 500 TPC IN ALL THE SPICES**

WE ARE INDIA'S LARGEST TOLL PROCESSORS IN

# STERILIZATION OF SPICES



**NAMAH AGRO FOOD INDUSTRIES**

[www.namahsteamsterile.com](http://www.namahsteamsterile.com)



## STEAM STERILIZATION – 100% ORGANIC

- A natural solution designed to reduce Micro Organism – while keeping product quality intact.
- (Spices/ Seeds/ Herbs/ Botanical/ Dehydrated Fruits and Vegetables with all kind of shapes of products – from whole to the finest form of powder)
- Many dry products need to be sterilized. Several Solutions exist like ETO/Ozone/UV.
- However, steam sterilization is the only efficient and globally accepted solution.
- TPC REDUCTION UPTO 99.99%
- No adverse effect on Flavour/Colour/Loss of Volatile Oil.



## GAMMA IRRADIATION

- The organoleptic properties such as appearance, colour, aroma, flavour and wholesomeness of the spices are fully preserved.
- No residual problem unlike chemical fumigants.
- Total removal of all stage of insect pests in stored product.
- Destruction of micro-organisms responsible for spoilage.
- Due to high penetrative nature of gamma rays spices can be processed in the final packed form.
- Efficient, less energy consuming and Non-Pollutive process.
- Reduced risk of food-borne diseases caused by micro-organisms such as Campylobacter, Salmonella, E. coli and Listeria (especially in meat, poultry and fish)
- Less need for some additives, such as preservatives and antioxidants.
- Lower risk of importing insect pests hidden inside food products.
- Reduced need for toxic chemical treatments, such as those used to kill bacteria found in spices.
- As an alternative to current treatment for disinfecting imported fruits, grains and vegetables, which uses an ozone-depleting gas.
- Reduced sprouting in potatoes, onions, herbs and spices.
- Food Products are completely safe for consumption
- Extended shelf life of products for upto 1 year.

**Contact Us For All Kind Of Spices Sterilization**

Plot No.1, Unit No. 2, G.I.D.C. Industrial Estate Por-Ramangamdi - 391 243, Dist. Vadodara, Gujarat, India.

**Cell No. :** 09825028823 / 09327245492 **Email :** [sterile@namahsteamsterile.com](mailto:sterile@namahsteamsterile.com)

# Gripping automation: cost-effective delta robot from igus as a construction kit

At the 2020 automatica, igus presented fast low-cost robots for less than €5,000

Grips easily, cost-effectively and quickly: that's what the new delta robot from igus does! Comprising maintenance-free toothed belt axes, lubrication-free links, encoders and stepper motors, igus has now developed a new and easy automation solution for assembly tasks. Sourced directly from stock as a pre-assembled construction system or delivered ready to install, the unit can be used immediately. The acquisition costs are paid off after half a year.

Automate simple tasks quickly, easily and cost-effectively: this is the goal of igus with its low-cost automation products. Besides its room gantries, the plastics specialist has now developed a completely new product in the form of a delta robot. It was presented to a specialist audience at the 2018 automatica in Munich. The robot is based on three maintenance-free drylin ZLW toothed belt axes, lubrication-free igubal coupling bars and matching adapter plates. NEMA stepper motors and encoders ensure the quick handling of up to 1 kilogram with a precision of  $\pm 0.5$  millimetres. The complete system has an installation space of up to 420 millimetres in diameter and can carry up to five kilograms at low speeds. The lightweight construction with aluminium and plastic makes the delta robot extremely cost-effective at a price of less than €5,000 and provides high speeds with a pick rate of at least 60 per minute. "The cost-effective delta robot enables our customers to have their own control box and integration at a cost of around €10,000 to 15,000. They pay off after just a few months, a maximum of half a year," explains Stefan Niermann, head of the drylin linear and drive technology division at igus GmbH.

## Available as a modular kit or ready-made system

Depending on the customer's requirements, the new delta robot can be delivered within 24 hours as a pre-assembled construction kit with assembly instructions in a box weighing 18 kilograms, or as a ready-to-install system in a transport frame. As an option, the customer can use their own software and control system, or the intuitive and easy-to-use dryve D1 control system. The use of the delta robot is



Picture PM3618-1  
Quick automation  
at a low price: the  
igus delta robot as  
an easily assembled  
complete package.  
(Source: igus GmbH)

very apt for simple assembly functions, pick and place tasks, as well as applications in inspection technology. In addition to the delta robot, igus also offers further low-cost robotics systems with its robolink product range. This range offers the user the opportunity to individually assemble robot arms with up to 5 axes from a modular system consisting of different joints with a wide variety of plastic gears, motors and interface connectors.

## ABOUT IGUS

igus GmbH is a globally leading manufacturer of energy chain systems and polymer plain bearings. The Cologne-based family business has offices in 35 countries and employs 3.800 people around the world. In 2017, igus generated a turnover of 690 million euros with motion plastics, plastic components for moving applications. igus operates the largest test laboratories and factories in its sector to offer customers quick turnaround times on innovative products and solutions tailored to their needs.

Press Contact:

**Ashish Rai**  
Industry Manager-Packaging

igus (India) Private Limited  
36/1, Sy. No. 17/3, Euro School Road,  
Dodda Nekkundi Industrial Area - 2nd Stage  
Mahadevapura Post, Bangalore - 560048  
Phone : +91 80 45127800, Cell: +91 7618792473  
arai@igus.net  
Visit us on [www.igus.in](http://www.igus.in)

## Innovative Packaging for OSI's Beef Steaks: Less Plastic, High-Class Optics, Excellent Quality

How can meat products be packaged in a resource-saving way, without having to compromise on product protection, hygiene and convenience? This is where the packaging industry, food manufacturers and retailers are searching for new solutions, for example for self-service meat products. Until today, it is impossible to do without plastic, but with FlatSkin® there now is an innovative packaging method available that proves to be more sustainable. OSI Europe, subsidiary of the globally active OSI Group that supplies meat products to leading brands in food service and retail, has opted for this novel packaging system for its high-quality steaks. With more than 65 production sites and 20,000 employees in 17 countries, the company has become a pioneer in the introduction of FlatSkin® packaging.

A major trigger for OSI to switch to this new packaging system have been the changing market conditions. As Erik Schöttl, Managing Director Foodworks Europe at OSI, explains: "We recently see a trend towards high-quality products, such as our dry-aged steaks. These products need to be packaged accordingly. At the same time, sustainability has become a key factor in the decision process of the consumer. Therefore, we started looking for a high-end packaging solution for our premium beef steaks from around the world, which would not only combine maximum product safety and high-class optics, but also convenient handling, cost-efficiency and conservation of resources." The answer was FlatSkin®, a joint

development of SEALPAC, supplier of high-tech tray-sealing technology, Van Genechten Packaging, specialist in cardboard packaging and folding cartons, and Wentus Kunststoff GmbH, professional in the field of barrier films and laminates. By joining hands, these three companies were able to develop a skin pack that fulfils the demands expressed by OSI.

### MARKETABLE SYSTEM WITH MANY SAVINGS

In the FlatSkin® process, a highly transparent barrier skin film fixates the product, for example a steak, directly onto the extremely flat cardboard carrier produced from bleached or unbleached fiber, which has been coated with a polymeric protective layer. This layer provides stability to the cardboard and forms a reliable barrier against

grease, moisture and oxygen. The cardboard carrier can be printed on both sides, hence offering optimal space for product information whilst providing unique branding opportunities. The FlatSkin® system combines all the benefits of skin packaging, such as extended shelf life and post-maturation, with a particularly attractive product presentation. At the same time, the system is extremely economical and sustainable, as it significantly reduces the amount of plastic used and improves recyclability.

Burkhard Meyer, Sales Director at Wentus, explains: "With this packaging solution, compared to common plastic skin trays, a plastic reduction of up to 75% can be achieved. The top film, which fixates the product onto the laminated cardboard carrier, has a thickness of just 80 to 150 micron."

Marcel Veenstra, Marketing & Communications Manager at SEALPAC, adds: "The trick to FlatSkin®: after taking out the product, the thin polymeric layer is easily removed from the cardboard by means of a peel tab to allow for separate disposal of the cardboard carrier as paper waste, and both liner and skin film as plastic waste."

The three participating companies put a great deal of effort into the FlatSkin® project. Challenges included the climatic conditions

*Erik Schöttl, Managing Director Foodworks at OSI Europe is proud implementing FlatSkin® so quickly and for bringing it to the market first.*



*SEALPAC's FlatSkin® system at OSI Europe Remarkable product presentation with excellent flatness of the cardboard carrier.*



prevailing in the meat industry, such as the high levels of humidity in production and logistics. "If fibrous materials, such as cardboard, absorb moisture, the fibers start to expand, which can cause the carrier to bend. This is why the carriers need to have excellent flatness. For this reason, we performed numerous tests under cold and humid circumstances in our own laboratory and in SEALPAC's Experience Center in Oldenburg, Germany, to ensure a smooth packaging process and excellent optics at all times", explains Manfred Grupp, Sales Manager at Van Genechten Packaging. By using the optimal peel material, an excellent match of cardboard and skin film is guaranteed, as well as a reliable seal of the packaging. In addition, a large-sized peel tab allows for easy opening of the skin pack.

#### **POSITIVE FEEDBACK FROM RETAIL**

The result is convincing: FlatSkin® not only ensures savings in plastic. The excellent two-sided printability of the cardboard carrier, which offers sufficient place for branding and product information, makes the additional sleeve, often required for skin products, unnecessary. "With the new packaging system, the filling rate of the transport boxes is also higher, which in turn reduces the amount of trucks on the road. Furthermore, not only do we use less material for packaging, but by separating and disposing of the components separately, we support better recycling", says Markus Holler, Group Operations Director Europe at OSI. FlatSkin® is used for the premium products within OSI's product portfolio. Robert Zeller, Sales Director Meat Solutions at OSI, emphasises: "Most important, our customers receive the highest quality. Meat products, such as our steaks, mature very well in the packaging. After opening, the

meat keeps its appetizing color and convinces with an extremely tender structure."

OSI Europe is proud for implementing this new packaging concept so quickly and for bringing it to the market first. Since the spring of 2018, the company has been successfully supplying all NETTO Marken-Discout stores in Germany with beef steaks packaged in FlatSkin®. The positive feedback from the retailers underline the success of FlatSkin®. The responsables at OSI Europe are particularly pleased about the fact that, despite a completely new packaging process, they received no complaints after many thousands of delivered packs. The company can be regarded as a pioneer for bringing more sustainability to the self-service meat segment, hence creating a strong buzz in the market. Now the use of FlatSkin® is to be gradually extended to other countries.

#### **PLASTIC PACKAGING MATERIALS – AS MUCH AS NECESSARY, AS LITTLE AS POSSIBLE**

How will this development continue? All the partners involved in the FlatSkin® project agree that efforts should be made towards an even more efficient use of resources. OSI will continue to focus on more sustainability through better recyclability and further reduction of consumables. "We are investigating the extent to which the thickness of our packaging can be reduced while maintaining the same level of protection for our products", says Markus Holler.

Film manufacturer Wentus is also working on further reduction of film thicknesses, as well as on recyclable mono materials, such as PP-based film. "This single-material packaging must be as powerful as common solutions, for example have a high

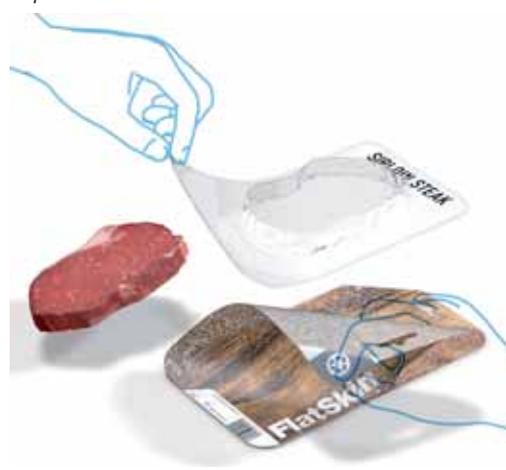


*Markus Holler, Group Operations Director at OSI Europe*

*By allowing consumers to dispose of the components separately, we support better recycling.*

barrier to survive on the market", emphasizes Burkhard Meyer. "For fresh food products, due to the required water vapor barrier, oxygen barrier and hermetic seal, there is no real alternative to plastic. That is why we are all challenged to think about sustainability in different ways", says Marcel Veenstra. Manfred Grupp from Van Genechten Packaging concludes: "With FlatSkin®, we have impressively shown that it is indeed possible to replace parts of the plastic packaging with other materials, such as fiber."

*The recyclability of SEALPAC's FlatSkin® system. Easy removal of skin film and polymeric layer from the cardboard allows for separate waste disposal*



## Sustainable Packaging Solutions for Superfoods

Canadian cereal brand maximizes packaging efficiency with Elematic 3001 WA case packer from Syntegon Technology

The demand for healthy, organic cereal-based products is on the rise, with revenue in Canada for breakfast cereals alone expected to reach 1.2 billion US dollars by 2021. Consequently, manufacturers need to expand their production capacities and equipment. The Vancouver-based cereal and superfood manufacturer Nature's Path offers consumers high quality, organic and planet-friendly products whilst demonstrating that packaging need not cost the earth. In order to reduce material waste and boost production efficiency, the company reached out to Bosch Packaging Technology, now Syntegon Technology.

Nature's Path Foods, Inc. offers premium, organic and sustainable products to customers all over the world. The company cares about the health of its customers and the planet, which is why the company is committed to promoting sustainable practices in the food industry. Nature's Path was one of the first companies to sign onto the Food Trade Sustainability Leadership Association's Declaration of Sustainability. By upgrading their case packing equipment with a solution from Syntegon Technology, Nature's Path managed to significantly reduce cardboard consumption while also boosting production efficiency.

### ON THE PATH TO SUSTAINABILITY

Founded in 1985, the company has adjusted to a number of developments in the retail industry, including the recent trend towards wholesale warehouse clubs and supercenters. These retail outlets offer larger package sizes for customers who want to bulk

buy staple ingredients and stock their pantries. In order to meet this demand for wholesale products, Nature's Path decided to offer their products in large stand-up bags and folding cartons of up to 1.25kg. For their corn flakes, granola and crunchy cereals weighing between 325g and 1.25kg they began to look for more flexible options.

Whilst market factors and consumer trends certainly influence company processes, they are not the only driver. "Every decision we make must align with our triple bottom line – being socially responsible, environmentally sustainable, and financially viable. In 2010, we became zero-waste certified and pledged to become completely carbon neutral by 2020. This step consequently entailed looking at the environmental impact of our packaging. As a result, we strive to use our packaging material as efficiently and effectively as possible, and Bosch Packaging Technology has been a reliable partner throughout this

journey," Nikhil Mehrotra, Packaging Engineer at Nature's Path explains. Nature's Path has been working with Bosch Packaging Technology, now Syntegon Technology, for a number of years, starting with a complete packaging line for cereal bars in Blaine, Washington in 2012. Over the years, the company has expanded their production capacities in order to accommodate their growing 100 percent organic product range, including cereals, oatmeal and granola.

### WRAP-AROUND CASE PACKER WITH EXCEPTIONAL FORMAT FLEXIBILITY

Nature's Path started looking for highly flexible case packing solutions for their production sites in Sussex, Wisconsin and Blaine, Washington that would address a very specific challenge: Packaging such delicate products into large, household-size packs. This can be tricky in terms of filling level, bag roundness and form stability. The packaging experts examined these



MEAT TENDERIZER  
SQUARE & ROUND



# Remington KNIVES

+91-9810023928    remingtonsteelarts@yahoo.com  
+91-9910017678    www.remingtonsteelarts.com

ICE CREAM SCRAPER



PARING & TURNING KNIVES



CHEF'S KNIVES WIDE



VEGETABLE KNIVES



BUTCHER'S KNIVES NARROW



DECORATING KNIVES



BUTCHER'S KNIVES WIDE



PIZZA CUTTING KNIVES  
SIDEWAYS HANDLES



BUTCHER'S KNIVES BROAD



PIZZA CUTTING KNIVES



BREAD KNIVES  
STRAIGHT POINTED & ROUND TIP



DE-BONING KNIVES



BONE CUTTING CHOPPER  
850 GMS



CHOPPER 350 GMS

BENT SPATULA



SCRAPPER



PALLETTE SPATULA



COLOUR CODES KNIVES



SHARPENING STONE & ROD



COLOUR CODES KNIVES



**DETAILED CATALOGUE CAN BE DOWNLOADED FROM OUR WEBSITE : [WWW.CHEFSKNIVES.CO.IN](http://WWW.CHEFSKNIVES.CO.IN)**

\*ALL THE KNIVES SHOWN ABOVE AS WELL AS LISTED IN OUR CATALOGUE ARE AVAILABLE IN ALL COLOR CODED HANDLES

particular needs in great detail and proposed the Elematic 3001 WA wrap-around case packer for medium and large sizes for the production site in Sussex. The machine cartons 325g- and 1kg-boxes of Crunch, Hemp Plus Granola and Corn Flakes. The site in Blaine also needed a new cartoning solution for boxes of cereal bars, so Nature's Path purchased the Elematic 3000 WAH for hooded wrap-around cases. Syntegon Technology also suggested the Elematic 3000 WAH XXL case packer to carton the 225g- and 650g-stand-up bags of the Qi'a superfood breakfast cereal at Nature's Path's production site in Sussex, Wisconsin. These case packers are ideal for shelf- and retail-ready products that are transported, stored and displayed in large cases, such as corrugated display bins placed at the end of supermarket aisles. The machines offer maximum flexibility as they can handle up to 35 different formats, pack styles and product sizes.

### **SIGNIFICANT MATERIAL AND COST SAVINGS**

Nature's Path's processing and packaging lines for cereals comprise a number of machines for filling and cartoning stand-up bags. As the last machine in the line, Syntegon Technology's Elematic case packers collate the packaged products into corrugated cases. The Elematic forms and fills 20 cases per minute via the lowerator principle, which stands out for its gentle handling and compact case packing. In order to make sure the Elematic 3001 WA would integrate well into the existing production line, Bosch Packaging experts at the packaging design center in Remshalden, Germany worked closely with Nature's Path to find a tailored solution for their packaging needs. "The team proposed a case packing solution that offers us high production speeds, maximum flexibility and an improved user experience. In doing



so, they have helped us become more sustainable. We managed to reduce our need for corrugated case material by up to 15 percent, which translated into substantial cost reductions as well as a significant contribution to our environmental mission," Mehrotra explains.

### **EASY MACHINE ACCESS FOR EFFICIENT FORMAT CHANGES**

The Elematic 3001 WA was designed with usability in mind. Loading blanks into the machine is hassle-free and back-friendly due to the ergonomically-designed low blank magazine. The case packer's open and easy-access framework offers another user-friendly advantage: it not only boosts visibility throughout the cartoning process, but also enables operators to quickly clean and adjust the machine. Thanks to the Elematic Click System, which is a standard feature on the Elematic 3001 series, format changes are tool-free and completely reproducible. A clearly audible clicking noise indicates to operators when the parts have successfully locked into place. This eliminates the need for adjustments and minimizes errors,

while helping Nature's Path to reduce scheduled downtimes. Format changeovers can be performed in approximately eight minutes - depending on the grouping pattern. The machine also features an external hotmelt granulate container and an HMI intuitive control panel which enables operators to program format selection, position, speed, timing and glue position.

### **SUCCESSFUL PARTNERSHIP**

The long-lasting relationship between Bosch Packaging, now Syntegon Technology, and Nature's Path is built on trust. "Having worked together for so long, we have established very close ties, despite the distance and time differences," Mehrotra explains. "With Jeff Downer we have a trusted contact person on the ground. Throughout the project, we truly felt that Bosch Packaging was there for us. For any further questions or issues, we knew we could reach out to the comprehensive customer services via their hub in Raleigh, North Carolina. The team took our specific needs into account and really valued our feedback."

5th edition

**16 17 18 October 2020**

Auto Cluster Exhibition Centre  
Pune, India

**Dairy**  
INDUSTRY EXPO 2020  
The Farming & Processing Event

**INDIA'S MOST PREFERRED DESTINATION FOR DAIRY AND ALLIED INDUSTRIES**



Concurrent Event

**ICE CREAM**  
INDUSTRY EXPO 2020  
Ice Cream Technology Event

# AN ABSOLUTE EVENT FOR DAIRY INDUSTRY

[www.dairyindustryexpo.com](http://www.dairyindustryexpo.com)

## Dairy Industry Expo 2019 Facts



Organizer



Knowledge Partner



Co-organizer



Conference Partner



**For Stall Booking**

+91 86074 63377, 86074 63131  
[p.arora@dairyindustryexpo.com](mailto:p.arora@dairyindustryexpo.com)

Follow us



**Head Office:** SCO-17, 2nd Floor, Mugal Canal Market, Karnal-132001, Haryana | Phone: +91 184 4047817

**Pune Office:** ADFI FORUM, Piyush Vila, #18, Behind Katraj Dairy, Near Narayani Dham, Katraj, Pune - 411046, MH

THE LEADING EVENT CONNECTING THE  
ENTIRE VALUE CHAIN OF THE  
BAKERY & CONFECTIONERY MARKET....



WHERE BUSINESS EXPANSIONS MEETS  
NETWORKING OPPORTUNITIES



**For Bookings / Queries Contact:**

Phone : +91 44 2278 0776 + 91 93802 20533 email: [btf@synergyexposures.com](mailto:btf@synergyexposures.com)



[www.bakerstechnologyfair.com](http://www.bakerstechnologyfair.com)    



"Miranda Annexe" 1st Floor, # 276, Anjaneyar Kovil Street,  
Vengalvasal, Chennai - 600 126 Tamil Nadu, India  
[info@bakerstechnologyfair.com](mailto:info@bakerstechnologyfair.com)

CONCURRENT  
EVENTS



www.foodtecindia.com  
www.anutecindia.com



# International Supplier Fair for the Food and Drink Industry

September 23-25, 2020

Hall 1, 2, 3 & 4

Bombay Convention & Exhibition Centre,  
Goregaon (E), Mumbai

*Included Segments:*



*Concurrent Event:*

Annapoorna



Koelnmesse YA Tradefair Pvt. Ltd.

Tel: +91-8125707722

info@koelnmesse-india.com



# PackPlus<sup>+</sup> *South* 2020

*The Total Packaging, Converting  
and Supply Chain Event*

**20 21 22** March  
HITEX, Hyderabad



Spread across  
7000+ sq mtrs



250+  
exhibitors



10000+  
visitors



Product  
Launches



LIVE Running  
machines



**South India's  
Largest Packaging  
Exhibition**

**#PackPlusSouth**

Visitor Registration  
Now open



Scan to Register,  
Its FREE!

**FOR BOOKINGS  
CONTACT**

Prateek Kaushik  
Tel: 011 - 6605 6344  
Email: prateek.kaushik@reedexpo.co.uk

[www.PackPlusSouth.in](http://www.PackPlusSouth.in)

10<sup>th</sup>  
Edition

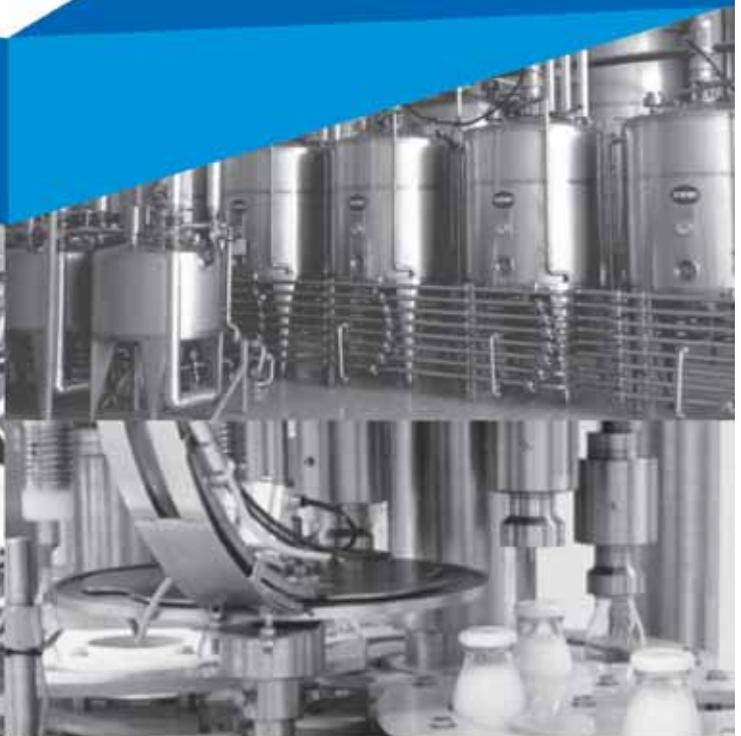


# DairyTech India 2020

International Exhibition on Dairy Products, Processing  
& Packaging Machinery and Allied Industries

18-19-20 AUGUST 2020  
BIEC, Bangalore, India

Concurrent Events:



Organizer:



Associate Partner:



Conceptual Partner:



Supported by:



Official Publications:



For stall booking and other details please contact:

Media Today Pvt. Ltd.

Phone: +91-11-29535593, Mob.: +91-9899380104

E-mail: [dairytechindiamtpl@gmail.com](mailto:dairytechindiamtpl@gmail.com)

Web.: [www.dairytechindia.in](http://www.dairytechindia.in)

Media Partners:



**IMPRESSUM FMT**

Publishing Company

**L.B. Associates (Pvt) Ltd**  
B-4/148C,  
Safdarjung Enclave  
New Delhi - 110029  
Website: www.lbassociates.com

**Publisher**

Linda Brady Hawwwwke

**Marketing & Events**

Binoy Sahee  
info@lbassociates.com  
Neenu Choudhary  
+91-8744069171  
contact@lbassociates.com  
info@fmtmagazine.in

**Editor**

Kanchi Batra  
kbatra@lbassociates.com  
fmeditorial@lbassociates.com

**Associate Editor**

Saurabh Dwivedi  
deskeditor@lbassociates.com

**Legal Consultant**

Roopa Somasundaran

**Layout & Design**

Atul Kumar

**Subscription**

sales@lbassociates.com  
Nishant Tiwary  
subscription@lbassociates.com  
+91-7827868187

**Parent Company**

Dr. Harnisch Publications  
P.O. Box 90328 Nuremberg, Germany  
Email: food@harnisch.com  
Website: www.harnisch.com/fmt

**NOTE:** Key numbers at the end of articles can be used as references for reader requests

**DISCLAIMER:** The views and opinions expressed in *Food Marketing & Technology, India* are solely those of the authors and do not necessarily reflect those of the editors or the publisher. Although all efforts have been made to ensure the complete accuracy of text, neither the editors nor the publisher can accept responsibility for consequences arising from errors or omissions or any opinions or advice given.



## National Events Calender

**BAKERS TECHNOLOGY FAIR**

3-5 July ..... Coimbatore

**DAIRY TECH INDIA 2020**

18-20 Aug ..... Bangalore

**INTERNATIONAL FOODTEC INDIA**

23-25 Sep ..... Mumbai

**DAIRY INDUSTRY EXPO**

16-18 Oct ..... Pune



**Since 1989, tailor-made  
italian system, never  
obsolete and always  
updatable systems**



**Packital**

**Checkweigher,  
combined control, dividers  
and combiners for packaged  
products**



Packital M series checkweighers combine an high accuracy level together with and great versatility. Perfect for food and beverage and pharmaceutical field applications.



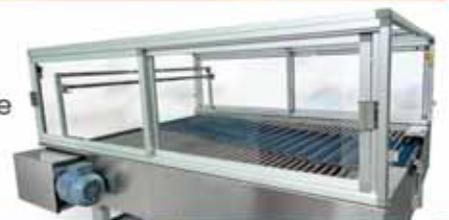
Packital C series, perfectly suitable for heavy duty applications, harsh environment for checkweighing large bag sizes and cartons or «multipacks» as bundles, shrinkwrapped packs and crates.



High degree of accuracy, combined with sturdiness and reliability are key features of Packital F series high speed checkweighers. Perfect for cans and glass applications.



Packital sliding slats dividers and combiners are able to meet every application where dividing or combining is needed.



**Packital** Via G. Cardano, 40 • 43036 Fidenza (Parma) • Tel +39.0524.527.260 • [www.packital.it](http://www.packital.it) • [mail@packital.it](mailto:mail@packital.it)

Distributor: **JFM • Jeevika Food Machine Private Limited**

6/10, 1st Floor, Senthil Andavar Street, Dhanalaxmi Colony, Vadapalani, Chennai-600026, Tamilnadu, India. - Tel +91 44 2362 2750 - [info@jfm.co.in](mailto:info@jfm.co.in) - [www.jfm.co.in](http://www.jfm.co.in)

If you can make it,  
**we bake it.**

**Now made in India!**

The Meincke Turbu oven is the best selling oven in the world! Not only is it the most energy-efficient oven on the market, it saves maintenance costs through fast change-overs and short reaction times. It's perfect for products that require an even coloring, humidity control, and mid-range temperatures.



**For more information, contact us:**  
[buhler.bangalore@buhlergroup.com](mailto:buhler.bangalore@buhlergroup.com)  
[www.buhlergroup.com](http://www.buhlergroup.com)



Innovations for a **better world.**

RNI No. UPENG/2010/38219

**BUHLER**