HINDUSTHAN

COLLEGE OF ENGINEERING AND TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF FOOD TECHNOLOGY

NEWSLETTER

VOLUME 3

JULY '20 TO DEC 20'

"ONE CAN TASTE AND EXPERIENCE THE SCIENCE IN FOOD SCIENCE"

VISION OF THE DEPARTMENT

"To be recognized for excellence in producing competent food technologists with comprehensive technical knowledge, innovative skill set and high ethical values.".

MISSION OF THE DEPARTMENT

DM1: *To impart sound technical and analytical knowledge to the students of Food Technology.*

DM2: *To inculcate leadership qualities and team spirit in addressing issues relating to the food industry and providing creative sustainable solutions.*

DM3: *To instill a sense of social responsibility in dealing with food processes, products and equipment.*

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The graduates of Food Technology shall be able to

PEO1: *Apply the principles of Food Science and Engineering in academics and research to succeed in professional career.*

PEO2: *Analyze and develop sustainable food processes and products with technical and economic feasibility to address global challenges through professional development.*

PEO3: *Exhibit professional and managerial capabilities with ethical conduct through continuous learning.*

PROGRAMME SPECIFIC OUTCOMES (PSOs)

The graduates of Food Technology shall

PSO1: *Identify the solutions for the real-world industrial challenges and ensure food safety and quality by adopting multidisciplinary approach and novel food processing techniques.*

PSO2: *Apply experiential and critical thinking skills in creating new food products to become a successful entrepreneur.*

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

1. ***Engineering knowledge:*** *Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.*
2. ***Problem analysis:*** *Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.*
3. ***Design/development of solutions:*** *Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.*
4. ***Conduct investigations of complex problems:*** *Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.*
5. ***Modern tool usage:*** *Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.*
6. ***The engineer and society:*** *Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.*

*7.**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.*

*8.**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.*

*9.**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings*

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*10.**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.*

*11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.*

*12.**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.*

TABLE OF ESSENCE

FACULTY ACHIEVEMENTS

PAPER/JOURNAL PUBLISHED

- **Dr Jeevarathinam G** (Associate Professor & Head) has presented a paper on **"Extraction of pectin and its quality evaluation from mango"** using HCL at an international conference 'Global Summit on Perspectives of Crop & Nutrition Security in New Normal (PCNNN 2020)' at Bannari Amman Institute of Technology, Tamil Nadu (Online platform) on **26.11.2020**.

BANNARI AMMAN INSTITUTE OF TECHNOLOGY
AN AUTONOMUS INSTITUE, Affiliated to Anna University, Chennai
Approved by AICTE accredited by NAAC with 'A' grade.

Certificate

This is to certify that Dr./Mr./Ms./Mrs. JEEVARATHINAM G participated and presented a paper on "Extraction of pectin and its quality evaluation from mango peel using HCL" in "Global Summit on Perspectives of Crop & Nutrition Security in the New Normal" (PCNNN 2020)" organised by BANNARI AMMAN INSTITUTE OF TECHNOLOGY under the aegis of DEPARTMENT OF AGRICULTURE ENGINEERING & DEPARTMENT OF FOOD TECHNOLOGY, BIT, Sathyamangalam held during 26th & 27th NOVEMBER 2020

DR R BALAKRISHNARAJA
HOD/FOOD

DR V CHELLADURAI
HOD/AGRI

DR C PALANISAMY
PRINCIPAL

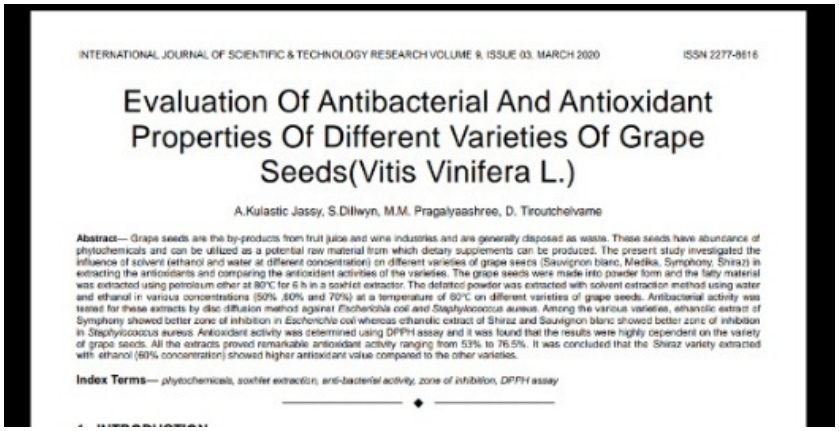
CERTIFICATE ID - PCNNN0069

- **Dr Jeevarathinam G** (Associate Professor & Head) has presented a paper on **"Infrared assisted hot air dryer for turmeric slices: Effect on drying kinetics and quality parameters "**at an international conference 'Global Summit on Perspectives of Crop & Nutrition Security in New Normal (PCNNN 2020)' at Bannari Amman Institute of Technology, Tamil Nadu (Online platform) on **27.11.2020**.

- **Dr Jeevarathinam G** (Associate Professor & Head) has presented a paper "**Modelling of thin layer drying characteristics of Osmo-dehydrated bitter gourd slices"** at an international conference 'Global Summit on Perspectives of Crop & Nutrition Security in New Normal (PCNNN 2020)' at Bannari Amman Institute of Technology, Tamil Nadu (Online platform) on **27.11.2020**.

- **Mrs Swathi K**(Assistant Professor) has published a paper on **"Optimization of domestic garlic flavoured conventional parboiled puffed rice (oryza sativa L.) Using RSM"** in the journal international journal of scientific & technology research, (volume 9, issue 04, April 2020) Indexed in Scopus with few other co-authors.

- **Mr Dillwyn s** (Assistant Professor) has published a paper on **"Evaluation Of Antibacterial And Antioxidant Properties Of Different Varieties Of Grape Seeds (Vitis Vinifera L.)"** in the journal international journal of scientific & technology research, (volume 9, issue 03, march 2020) Indexed in Scopus with few other co-authors.



INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 9, ISSUE 03, MARCH 2020 ISSN 2277-8616

Evaluation Of Antibacterial And Antioxidant Properties Of Different Varieties Of Grape Seeds(Vitis Vinifera L.)

A.Kulastic Jassy, S.Dillwyn, M.M. Pragalyaashree, D. Tiroutchelvame

Abstract— Grape seeds are the by-products from fruit juice and wine industries and are generally disposed as waste. These seeds have abundance of phytochemicals and can be utilized as a potential raw material from which dietary supplements can be produced. The present study investigated the influence of solvent (ethanol and water at different concentration) on different varieties of grape seeds (Sauvignon blanc, Merlot, Symphony, Shiraz) in extracting the antioxidants and comparing the antioxidant activities of the varieties. The grape seeds were made into powder form and the fatty material was extracted using petroleum ether at 80°C for 6 h in a soxhlet extractor. The defatted powder was extracted with solvent extraction method using water and ethanol in various concentrations (50% ,60% and 70%) at a temperature of 60°C on different varieties of grape seeds. Antibacterial activity was tested for these extracts by disc diffusion method against *Escherichia coli and Staphylococcus aureus*. Among the various varieties, ethanolic extract of Symphony showed better zone of inhibition in *Escherichia coli* whereas ethanolic extract of Shiraz and Sauvignon blanc showed better zone of inhibition in *Staphylococcus aureus*. Antioxidant activity was determined using DPPH assay and it was found that the results were highly dependent on the variety of grape seeds. All the extracts proved remarkable antioxidant activity ranging from 53% to 76.5%. It was concluded that the Shiraz variety extracted with ethanol (60% concentration) showed higher antioxidant value compared to the other varieties.

Index Terms— *phytochemicals, soxhlet extraction, anti-bacterial activity, zone of inhibition, DPPH assay*

- **Dr Jeevarathinam G** (Associate Professor & Head) has submitted a project proposal for funding on the topic" **Design and Development of Solar Energy based Infrared Assisted Vacuum Dryer for Fresh Agro Produces"** sponsored by SERB/DST.

WEBINARS ORGANIZED

- **Dr Jeevarathinam G** (Associate Professor & Head) conducted a webinar(online platform) on **"International Virtual Online Faculty Development Programme on Sustainable Development and Research Opportunities in Food and Chemical Engineering"** on **5.10.2020-11.10.2020** (1 Week).
- **Mrs SWATHI K** (Assistant Professor) conducted a webinar on **" Recent Trends in Various Process Techniques"** on **Oct-20.**
- **Mr Dillwyn S** (Assistant Professor) conducted a webinar (online platform on **"Advancement in dairy processing and value-added dairy products"** at the CSE seminar hall on **06.02.2020.**

Participation in Conference/Seminars/Training (FDP) Programme by faculty

- Our faculties have participated in several webinars, conferences, seminars and training programmes conducted through online platforms during this pandemic.
- **Mrs SWATHI K, Mrs Nageswari G, Dr Jeevarathinam G, and Mr Dillwyn S** have completed training courses from the Coursera certification platform.

FDP/SEMINAR ORGANISED

- Seminar on **"Virtual Seminar on Food additives and its health impact"** was organised by the faculty **Mrs Swathi K** on **10.10.2020.**
- **"International Virtual online Faculty Development Programme on Sustainable Development and Research Opportunities in Food and Chemical Engineering"** was organised by the faculties **Dr. Jeevarathinam G, Mr. Dillwyn S, Ms. Induja P** on **05.10.2020 – 11.10.2020** (1 Week).

STUDENTS ACHIEVEMENTS

2nd year students:

- **Mr. Noble Paul, Ms. Kanishkha, Ms. Kaaviya, Mr. Sharuk Khan, Ms. Sasi rekha** (second year FT), had done their collaborative activity: online internship under the company **BOOM ICE CREAMS (Benny's foods)** for a period of 15 days from **Jul 15-jul 30**.

- Few of our students from **Second year FT** has completed **23 courses** and obtained their certificates from **edX** through online platform.

- Also the students of **Second year FT** had completed nearly **421 training courses** and obtained their certificates from **coursera** through online platform.
- **Ms Sasi Rekha P and Ms Sowmya S** from **Second year FT** has done their **NPTEL** course and also written their exams well and got passed.

3RD YEAR STUDENTS:

- All the students of **third year FT** had completed nearly **577 training courses** and obtained their certificates from **coursera** through online platform.

- **Ms. Srimathi R** from third year FT has done their NPTEL course and also written their exams well and got passed.

MS. KANISHKHA G

Participated in:

- Kalam program on up literacy on 5/6/2020-7/6/2020
- Preparation for BEC and a dream career (Webinar) on 1/7/2020.
- Prove your proficiency (online meet via Google) on 15/10/2020 - 23/10/2020, Qreative- Melt & pour.

MS. JASEENA K

Participated in:

- Nutrition awareness activity 2020 on 4/12/2020.

MS. VARNNA PRIYA M

Participated in:

- International webinar - food safety policies and regulation on 27.07.2020.
- NewGen internship (ongoing) on 03-02-2021 to (present)
- Virtual Seminar Programme- "PROCESS PLANT OVERVIEW AND CONTROL VALVE BASICS on 23.10.2020.
- Virtual seminar on food additives and its health impact on 10.10.2020.
- National Level Quiz on World Science Day on 10.11.2020
- India's first leadership talk by MHRD innovation cell on 11.07.2020.
- National IP literacy week- MHRD innovation cell on 15/10/2020 - 23/10/2020.

MS. MAGITTA SHERINE S

Participated in:

- Webinar On Cleaning And Sanitation In Meat Processing Plant on 08.08.2020.
- Webinar on HACCP in poultry processing on 08.08.2020
- Webinar on preventive controls for microbial safety of food on 08.08.2020.
- Virtual seminar on food additives and its health impact on 10.10.2020.
- Virtual training program on "Food fraud and Culture of Food Safety" on 17.10.2020.

MS. RONITALINI C

Participated in:

- Online Training On "Cleaning And Sanitation In Meat Processing Plant" on 07.08.2020.
- Online Training On "An Example Of Method Validation And Verification According To The ISO 16140 Standard on 05.08.2020.
- Online Training On "Preventive Control For Microbial Safety Of Foods" on 06.08.2020.
- Online Training On "HACCP In Poultry Processing" on 08.08.2020.

MS. SAREKHA P

Participated in:

- Webinar on An Introduction to FSSAI act and regulation on 19.08.20.
- Webinar on traditional foods and flavour: Discovering the hidden treasure on 12.08.20 – 14.08.20.
- Virtual seminar on food additives and its health impact 10.10.20.

MS. SHAKEEL AHAMED

Participated in:

- International webinar – food safety policies and regulation on 27.07.2020.
- Virtual Seminar Programme– "PROCESS PLANT OVERVIEW AND CONTROL VALVE BASICS on 23.10.2020.
- Virtual seminar on food additives and its health impact on 10.10.2020.
- National Level Quiz on World Science Day on 10.11.2020 India's first leadership talk by MHRD innovation cell on 11.07.2020.
- National IP literacy week– MHRD innovation cell on 15/10/2020–23/10/2020.

MS. APARNA P

Participated in:

- National IP literacy week– MHRD innovation cell on 15/10/2020–23/10/2020.
- Virtual seminar on food additives and it's health impact on 10/10/2020.
- Online training on an example of method validation and verification according to the ISO 16140 standards– FSSAI on 4/8/2020.

- Online training on preventive controls for microbial safety of food- FSSAI on 5/8/2020.
- Online training on topic cleaning and sanitation in meat processing plants- FSSAI on 6/8/2020.

MS. GOMATHI S

Participated in:

- Webinar on HACCP in poultry processing on 08.08.2020
- Webinar on preventive controls for microbial safety of food on 08.08.2020.
- Food fraud and Food safety culture on 18/10/2020.
- Virtual seminar on Food additives and its health impact on 10/10/2020.
- Quiz on national nutrition month 2020 on 14/8/2020.

MS. FARHANA RASHEED

Participated in:

- Completion of National IP literacy week-MHRD innovation cell on 15-10-2020 to 23-10-2020.
- Online training on cleaning and sanitation on meat processing plants-FSSAI on 06-08-2020.
- HACCP in poultry processing online training on 08-08-2020.
- Online train on Auto titrations for food and beverage industries-FSSAI on 11-08-2020.
- online training on Traceability-FSSAI on 12-08-2020.
- Webinar on Demand for skilled engineers in electric vehicles industry - Anurag university on 14-09-2020.
- Webinar on Indian automotive industry job and tech-Anurag university on 15-09-2020.
- Virtual seminar on Process plant overview and control value basics on 23-10-2020.

- Online training on Preventive controls on microbial safety on food on 06-08-2020.
- Quiz on FSSA,2006-Mahapreneur India, Pvt Ltd on 13-09-2020.
- Virtual seminar on food additives and it's health impact on 10-10-2020.

MR. JOSIAH SAMUEL JOHNSON

Participated in:

- Virtual seminar on food additives and its health impact on 10-10-2020.

MR. SIDANE TOMS

Participated in:

- National webinar series on Recent advances in dairy process engineering on 24th -28th August 2020.
- Virtual Seminar Programme- "PROCESS PLANT OVERVIEW AND CONTROL VALVE BASICS on 23-10-2020.
- Completion of National IP literacy week 15-10-2020 to on 23-10-2020.

MR. BASIL VARGHESE

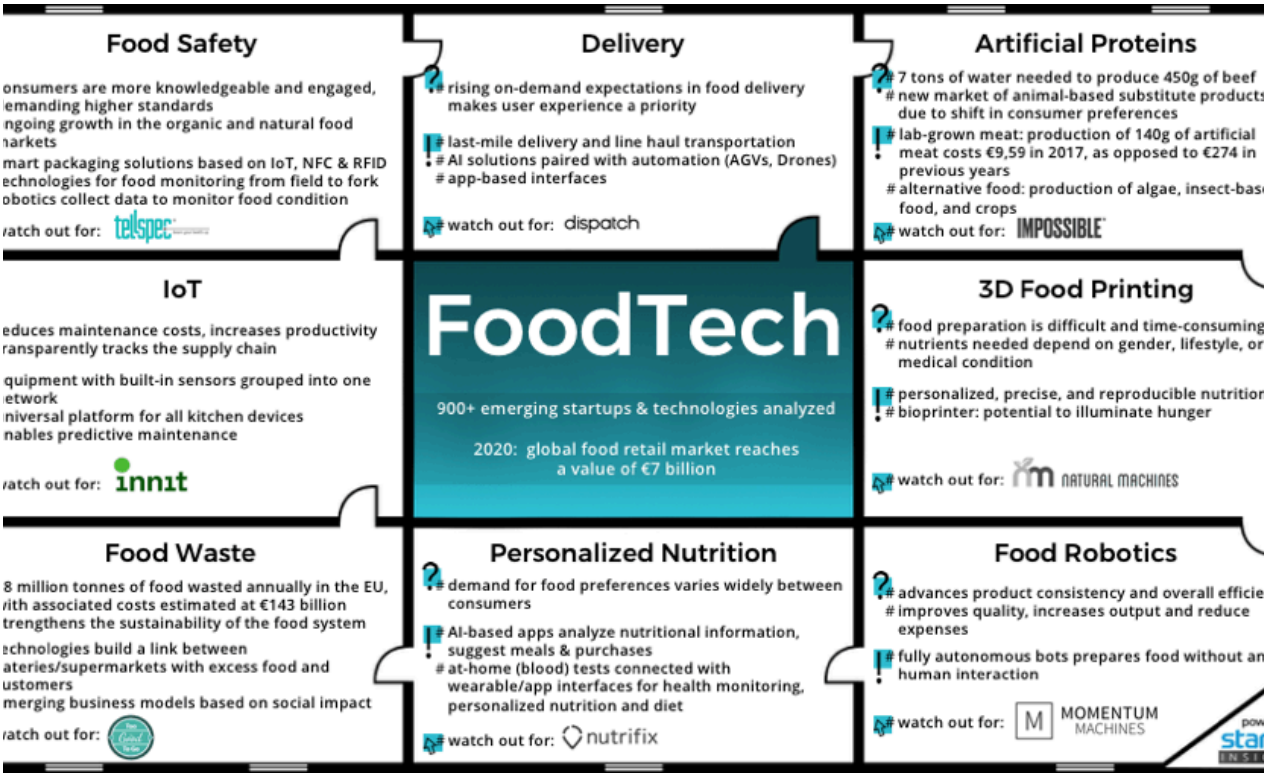
Participated in:

- FSSAI-online training on An example of method validation and verification according to the ISO 16140 standards on 04/08/2020.
- FSAAI-online training on Preventive controls for microbial safety of food on 05/08/2020.
- FSSAI-online training on importance of ultra pure water in food applications on 06/08/2020.
- FSSAI-online training on Topic HACCP in poultry processing on 07/08/2020.
- Virtual seminar on Food addictive's and its Health impact by Depart of food technology HICET on 10/10/2020.

MS. DHARSHANA R

Participated in:

Newgen infotech internship on 03-02-2021 to present



MR. JAHFAR P M

Participated in:

- Virtual seminar on food additives and its health impact on 10-10-2020.
- FSAAI-online training on Preventive controls for microbial safety of food on 05-08-2020.
- FSSAI-online training on Topic cleaning and sanitation in meat processing plants on 06-08-2020.
- "GURUDEV-2020" Online quiz on Mahatma Gandhi organized by IQ CLUB of HICET" on 02-10-2020.

MR. ABHIJITH P

Participated in:

- Virtual Seminar Programme- "PROCESS PLANT OVERVIEW AND CONTROL VALVE BASICS on 23-10-2020.

MR. MOHAMMED ROSHAN C

Participated in:

- FSSAI-online training on An example of method validation and verification according to the ISO 16140 standards on 07-08-2020.
- FSAAI-online training on Preventive controls for microbial safety of food on 07-08-2020.
- FSSAI-online training on Topic cleaning and sanitation in meat processing plants on 07-08-2020.
- FSSAI-online training on Topic HACCP in poultry processing on 07-08-2020.
- Virtual seminar on Food addictive's and its Health impact by Dept of Food Technology HICET on 10-10-2020.
- "GURUDEV-2020" Online quiz on Mahatma Gandhi organized by IQ CLUB of HICET on 02-10-2020.

MR. KHAIS ALI MARAKKAR V

Participated in:

- Virtual Seminar on Food Additives and its Health Impacts on 10/10/20.
- Kalam Program for IP Literacy and Awareness on 15/10/20 to 23/10/20.
- FSSAI-Online training on Topic HACCP in Poultry Processing on 09/08/20.
- FSAAI-Online training on Preventive Controls for Microbial Safety of Food on 09/08/20.

MS. SRIMATHI R

Participated in:

- Virtual seminar on food additives and its health impacts on 10-10-2020.
- Virtual seminar on "Process plant overview and control valve basics" on 23-10-2020.
- Food fraud and food safety culture on 18-10-2020.
- Artificial intelligence by crash course on 09-2020.
- National level E-quiz program on "Nutrition, immunity and covid-19"with 100% on 29-30-sep-2020.
- Kalam program for IP literacy and awareness on 15to23-oct-2020.

MS. FARSIN RASAK

Participated in:

- FSSAI-Online Training on "An example of method validation and verification according to the ISO 16140 Standards" on 04-08-2020.
- FSSAI – Online Training on "Preventive controls for microbial safety of food" on 06-08-2020.
- FSSAI – Online Training on "Topic Cleaning and sanitation in meat processing plants "on 06-08-2020.
- “Virtual Seminar on Food Additives and its health impact” on 10-10-2020.

MR. AMAL DEV. P.A

Participated in:

- FSSAI-online training on Topic cleaning and sanitation in meat processing plants on 08-09-2020.
- FSSAI-Online training on Topic HACCP in Poultry Processing on 08-09-2020.

MR. AFRID KAMAL PT

Participated in:

- ”Virtual seminar on food additives and its health impact" on 10-10-2020.
- ”Process plant overview and control valve basics" on 23-10-2020.

MR. SHARON RAJAN

Participated in:

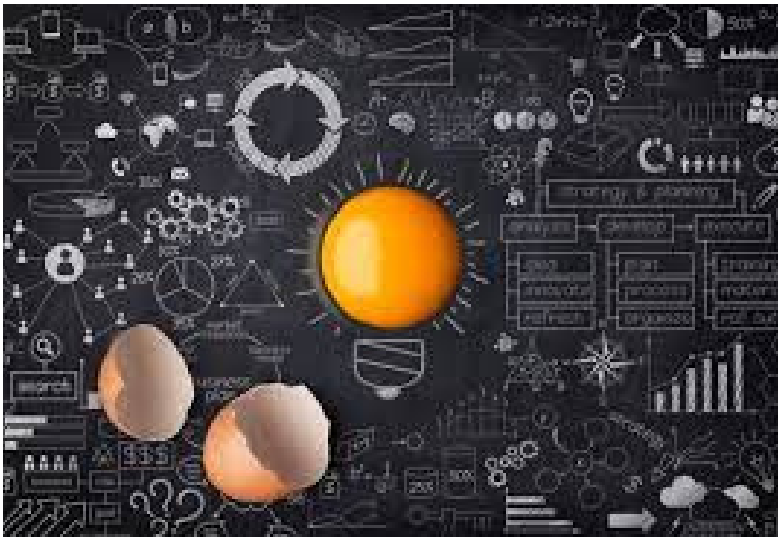
- National IP literacy week- MHRD innovation cell on 15/10/2020 - 23/10/2020.
- Virtual seminar on food additives and its health impact on 10/10/2020.

- "Virtual Seminar Programme- “PROCESS PLANT OVERVIEW AND CONTROL VALVE BASIC on 23/10/2020.

MR. MOHAMED AFRITH M

Participated in:

- Webinar on "Emerging Opportunities In Food Processing Sector" on 1/10/2020 – 03/10/2020.
- Seminar on "Process Plant Overview And Control Values Basics" on 23 Oct 2020 Seminar on "Food Additives And Health Impact" 10/10/2020.
- Kalam program for IP literacy and awareness- MHRD innovation cell on 15/10/2020 – 23/10/2020.



MS. FATHIMATHUL ZAHARA KELOTH POYIL

Participated in:

- Kalam program for IP literacy and awareness-MHRD INNOVATION CELL on 15/10/2020 \- 23/10/2020.
- Seminar on "Process Plant Overview And Control Values Basics" on 23rd October 2020.
- Virtual seminar on food additives and its health impact on 10th October 2020.

MR. ALPHIN THAMPI

Participated in:

- Virtual seminar on food additives and it's health impact on 10/10/2020.
- FSSAI – Online training on topic HACCP in poultry processing on 08/09/2020.
- FSSAI – Online training on topic cleaning and sanitation in meat processing plants on 06/08/2020.
- FSSAI – online training on preventive controls for microbial safety of food on 07/08/2020.
- FSSAI – Online training on an example of method validation and verification according to the ISO 16140 standards on 04/08/2020.
- Kalam program for IP literacy and awareness on 15/10/2020 to 23/10/2020.

MR. PRAKASH R

Participated in:

- Seminar on – Food Additives and Health impact on 10/10/2020.

ARTICLE CORNER

Food scientists aim to make plant-based protein tastier and healthier

As meat-eating continues to increase around the world, food scientists are focusing on ways to create healthier, better-tasting and more sustainable plant-based protein products that mimic meat, fish, milk, cheese and eggs.

It's no simple task, says food scientist David Julian McClements, University of Massachusetts Amherst Distinguished Professor and lead author of a paper in the new *Nature* journal, *Science of Food,* that explores the topic.

"With Beyond Meat and Impossible Foods and other products coming on the market, there's a huge interest in plant-based foods for improved sustainability, health and ethical reasons," says McClements, a leading expert in food design and nanotechnology, and author of Future Foods: How Modern Science Is Transforming the Way We Eat.
In 2019, the plant-based food market in the U.S. alone was valued at nearly $5 billion, with 40.5% of sales in the milk category and 18.9% in plant-based meat products, the paper notes. That represented a market value growth of 29% from 2017.

With funding from the USDA's National Institute of Food and Agriculture and the Good Food Institute, McClements leads a multidisciplinary team at UMass Amherst that is exploring the science behind designing better plant-based protein. Co-author Lutz Grossmann, who recently joined the UMass Amherst food science team as an assistant professor, has expertise in alternative protein sources, McClements notes.
"Our research has pivoted toward this topic," McClements says. "There's a huge amount of innovation and investment in this area, and I get contacted frequently by different start-up companies who are trying to make plant-based fish or eggs or cheese, but who often don't have a background in the science of foods.“

While the plant-based food sector is expanding to meet consumer demand, McClements notes in the paper that "a plant-based diet is not necessarily better than an omnivore diet from a nutritional perspective."

Plant-based products need to be fortified with micronutrients that are naturally present in animal meat, milk and eggs, including vitamin D, calcium and zinc. They also have to be digestible and provide the full complement of essential amino acids.

McClements says that many of the current generation of highly processed, plant-based meat products are unhealthy because they're full of saturated fat, salt and sugar. But he adds that ultra-processed food does not have to be unhealthy.

That's the goal in the future, but we're not there yet for most products."

For this reason, McClements says, the UMass Amherst team of scientists is taking a holistic, multidisciplinary approach to tackle this complex problem.

-x-x-x-

Exploiting new opportunities in a rapidly changing market is key to business success, says Denbigh Lloyd

Developments shaping the future of food ingredients

The food ingredient industry of the 21st century continues to face different pressures ranging from ever-increasing sophisticated consumer demands, health and ethical concerns and a more detailed regulatory environment, through to greater market competitiveness, price sensitivity, industry consolidation, raw material availability and global demands.

The responses of the industry to these issues demonstrate the diversity of approach needed to both survive and grow in such an environment.

This background has shaped the ingredient industry and the ongoing challenges continue to drive a refocusing of its business models, as well as encouraging the need to reach out to different markets. The challenge for businesses, however, is how best to take advantage of such a dynamic situation.

Increasing sophistication

The most significant change has been the increasing sophistication of products and service range offered by the industry. In most cases, the concept of simple product supply and demand has long been surpassed by the development of a model designed to meet customer needs through far more tailored, value added products and services.

The economics of the wider food, beverage and related agri-products industries continue to drive ever greater efficiency and higher service levels. This also encourages even closer working arrangements between them and their ingredient suppliers.

In many cases, end-user companies routinely expect their ingredient suppliers to develop new solutions for them in what is effectively an outsourced development role. The success of the ingredient businesses in these situations depends on their ability to respond effectively to these demands.

The range of ingredient companies employing references to 'innovation', 'solutions', 'partnership' etc in their promotional material is testimony to these changes.

In this environment, one has seen the diversification of the industry to meet this challenge. The highly competitive consumer food market drives companies to seek ever-stronger product positioning and, in turn, puts pressure on ingredient suppliers.

These demands have been responsible for the requirement to offer uniquely tailored products and services to customers, often resulting in sophisticated application centres where the products are developed, evaluated and proven in dedicated end- use products.

The demand for natural products continues to rise globally but so does the demand for ever-more cost-effective ingredients. The clear interest in clean labelling of products for consumers is driving many parts of the industry to search for new processing and sourcing methods to meet this need. The expanding organic products market is also part of a growing trend of consumers engaging with the supply chain of the final product. This, combined with increasing consumer digital awareness, whereby sustainability, product sourcing and ethics, production and other elements are readily searchable online, is all driving a new approach to ingredients.

In many ways, the transparency of the story of your product and its production is becoming as important as the product itself. Finding a way through this complex environment takes ingenuity, time and patience to bring the very best from a company's valuable resources, its products, marketing and, above all, its people.

Careful and detailed analysis together with a distinctly lateral thinking approach can reveal new opportunities to exploit in today's rapidly changing market.

Ability to adapt

The food ingredient manufacturers of the future will continue to face the challenges that have shaped the industry over time – be it political, regulatory, economic or market and consumer demands. The key to a constantly changing environment is the ability to adapt and to successfully develop opportunities from these situations by offering new products, services and business models.

It's clear that the industry will also embrace further extensive technological change: 3D printing, for example, which may seem embryonic, already has the capacity to produce a range of foods. 3D additive manufacturing technology can be used together with other processes to copy existing products or to develop completely new ones. Printing food will also become a more widespread reality. In the US and Europe, we have seen products from sugar confectionery, chewing gum, chocolates, pasta and pizzas made with this technology. Manufacturers may use the flexibility of these approaches to tailor products to meet customer needs, and enhance diversity of offering and delivery methods.

The ingredient industry is in every sense a vital part of the food industry, and has increasingly developed its ability to deliver more to its customers in order to meet wider consumer demands. The sophistication of product development diversity, product tailoring, use of specialist application and evaluation facilities across the industry has proven the point and will continue to shape its future. ■

Denbigh Lloyd works as a business development, marketing and training consultant with the food and agri-products industries.

EDITORIAL BOARD

STUDENT EDITORS

MS. NIHARIKA BIPIN - III FT &
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(Assistant Professor)

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