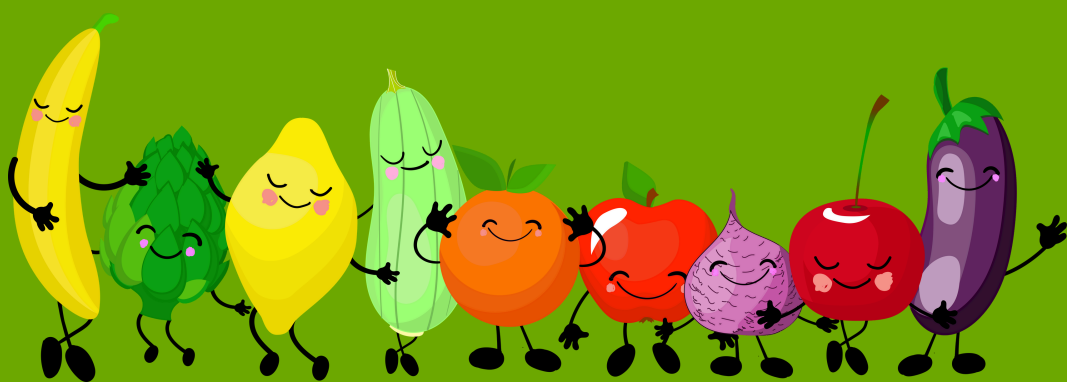
HINDUSTHAN
COLLEGE OF ENGINEERING AND TECHNOLOGY
(AN AUTONOMOUS INSTITUTION)

Volume 4
JAN '21 TO JUNE' 21

FIC

"FOOD INNOVATORS CLUB"



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.*

*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 INGREDIENTS

STAFF ACHIEVEMENTS

Dr Jeevarathinam G (Associate Professor & Head/ FT) has published a paper on “Infrared assisted hot air turmeric slices: Effect on drying kinetics and quality parameters” in the journal LWT-Food Science and Technology, 144, 11258, 2021 (Volume No., Page No., Year / Month of Publication) published by Elsevier with few other co-authors.

LWT - Food Science and Technology 144 (2021) 111258

Contents lists available at ScienceDirect

LWT

journal homepage: www.elsevier.com/locate/lwt

Infrared assisted hot air dryer for turmeric slices:Effect on drying rate and quality parameters

G. Jeevarathinam [a,b], R. Pandiselvam [c,*], T. Pandiarajan [d], P. Preetha [a], M. Balakrishnan [a], V. Thirupathi [d], Anjineyulu Kothakota [e]

ARTICLE INFO

Keywords:
Curcumin
Hot air drying
Hybrid drying
Sun drying
Oleoresin

ABSTRACT

An infrared assisted with hot air dryer (IRHAD) was designed and developed to retain the quality of turmeric during drying. Drying experiments were conducted at three different mode of operation [infrared assisted with hot air drying (IRHAD), infrared drying (IRD), and hot air drying (HAD)] and three different drying temperatures (50, 60 and 70 °C) at fixed air velocity of 2 m/s. It was observed that IRHAD at 70 °C showed higher drying rate and recorded 26.98% and 35.21% lesser drying time than IRD and HAD, respectively. An increase in drying temperature (up to 60 °C) increase the curcumin, oleoresin, colour and starch content and further increase in temperature degrades the quality of the turmeric. IRHAD provided maximum retention of curcumin, oleoresin, and starch content and less colour deterioration at 60 °C temperature compared to IRD and HAD. The drying methods and drying temperatures have significant effect ($P \leq 0.01$) on the quality parameters investigated. IRHAD with the drying temperature of 60 °C could be the suitable operating condition to produce better-quality turmeric.

Dr Jeevarathinam G (Associate Professor & Head/ FT) has published a paper on “Microencapsulation of bixin pigment by spray drying: Evaluation of characteristics” ,111343, 2021 (Volume No., Page No., Year / Month of Publication) published by Elsevier with few other co-authors.

LWT

Volume 145, June 2021, 111343

Microencapsulation of bixin pigment by spray drying: Evaluation of characteristics

M. Balakrishnan [a], S. Gayathiri [a], P. Preetha [a], R. Pandiselvam [b], G. Jeevarathinam [c], D.S. Aniesrani Delfiya [d], Anjineyulu Kothakota [e]

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https://doi.org/10.1016/j.lwt.2021.111343 Get rights and content

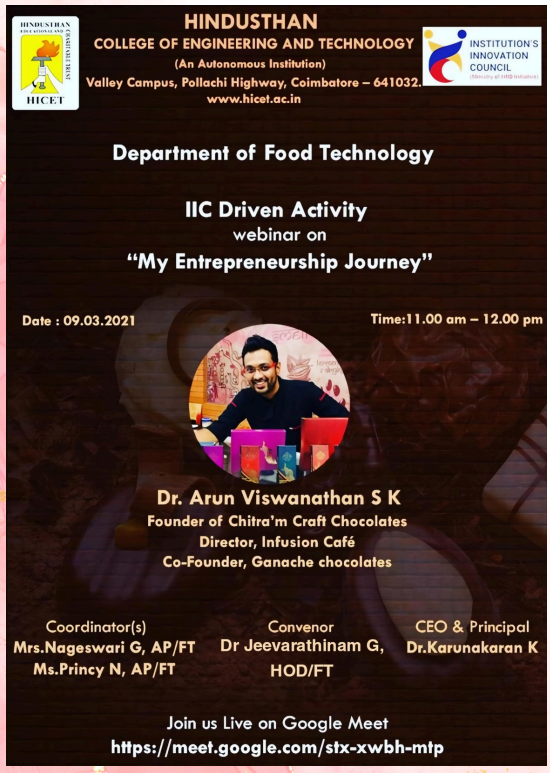
Highlights

- The highest encapsulation efficiency 86.37% was recorded for the commercial annatto extract microcapsules.
- The encapsulated particle size ranged from 1 to 7.2 μm with spherical shape.
- Encapsulated extract recorded higher stability against light, oxygen and heat.

WEBINAR \ SEMINAR ORGANISED ON CAMPUS

- Webinar on “Food Technology & Its Myriad of Opportunities for a Prospective Career” by Er. Madhu Kaiwara Narayanaswamy Team Manager Processing Almarai.Co Saudi Arabia on 1st March 2021

- Webinar on “My Entrepreneurship Journey” by Dr. Arun Viswanathan S K Founder of Chitra’m Craft Chocolates Director, Infusion Café Co-Founder, Ganache chocolates on 9th March 2021.



- Webinar on “Entrepreneurship and business opportunities in Agribusiness and Food Industry” by Mr. Sagar Athithiyan, Zonal Head South India at FarmX- ICAR, Territory Manager - Koppert Biological Systems, Tamil Nadu & Kerala on 06.02.2021.

- Webinar on “Students Association Inauguration - Fiduciary of Food Innovation” by Dr Shivaraj G, Manager, Media.net, Early talent acquisition (India) on 13.02.2021.
- Webinar on “Entrepreneurship and careers beyond opportunities in Food Processing sector” by Dr Shivaraj G, Manager, Media.net, Early talent acquisition (India) on 13.02.2021.
- Webinar on “Introduction on high-pressure processing and scope of food processing” was organized by the faculty Er. Dillwyn S, on 26.02.2021.

PARTICIPATION IN CONFERENCE / SEMINARS / VIRTUAL TRAINING

Our faculties Mrs Nageswari G, Dr Jeevarathinam G, Mr Dillwyn S, Ms Princy N, Mrs Neethu C S has participated in several webinars, conferences, seminars and training programmes conducted through the online platform during this pandemic.

Mrs Swathi K, Dr Jeevarathinam G, Mr Dillwyn S has completed many training courses from the Coursera certification platform.

Name of the faculty	Name of the course
Mrs Swathi K	AI for Everyone Positive psychology Food and
	Beverage Management Transformation of Global
	Food System
	Novel Technologies for food processing and shelf life
	extension
Mr Dillwyn S	AI for Everyone
	Positive Psychology
	Transformation of Global Food System
	Advanced Instructional Strategies in the Virtual Classroom
Dr Jeevarathinam G	Leadership and Emotional Intelligence
	Positive Psychology

STUDENTS ASSOCIATION INAUGURATION
FIDUCIARY OF FOOD INNOVATION

-

The food technology student association club was inaugurated on 13.02.2021 by Dr. Shivaraj G, Manager, Media.net, Early talent acquisition. For the development of students and the club was named as “Fiduciary of Food Innovation”

OFFICE BEARERS:

- PRESIDENT - SIDDHARTH L
- ASSISTANT PRESIDENT - SHARUKKHAN S
- SECRETARY - MAGITTA SHERINE S
- ASSISTANT SECRETARY – KANISHKHA G
- TREASURER - GOMATHI.S & FARSIN RASAK
- ASSISTANT TREASURER – SASI REKHA

STUDENTS ACHIEVEMENTS

II YEAR STUDENTS: MR. IHTHISHAS AHAMED V K

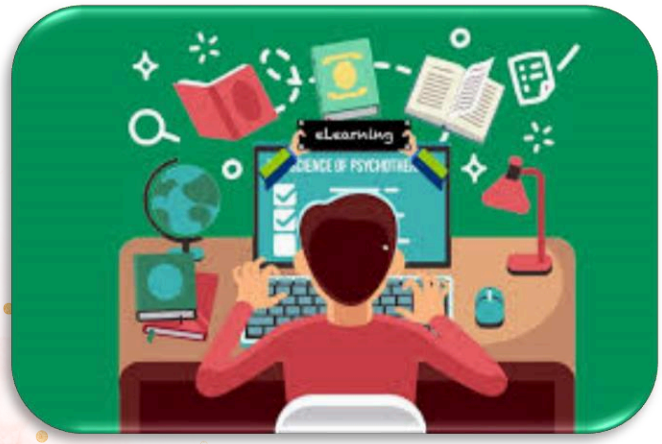
Participated in EQUIZ on

23.05.2021

MS. KANISHKHA G

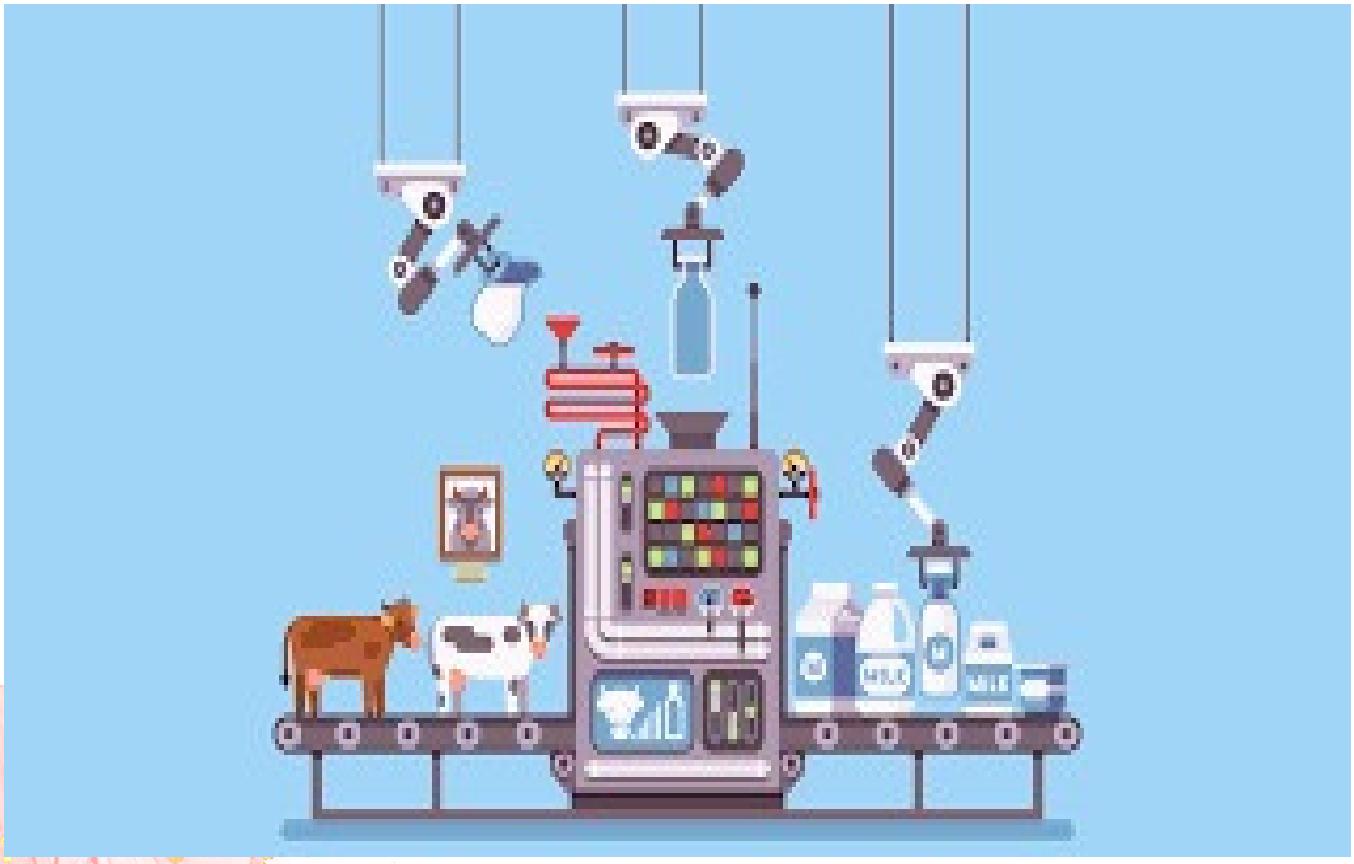
Participated in:

- Cold process soap making on 12/1/2021.
- Qreative Facial gel & Face Cream making on 17/2/2021.



III YEAR STUDENTS:

- M. Varnnapriya, R. Dharshana, R. Srimathi, Farhana Rasheed are doing their internship at NewGen internship (ongoing) from 03-02-2021 to (present)
- S. Magitta Sherine, C. Ronitalini, S. Gomathi done their internship at Patwari
- Bakers (Parle-G) from 16.02.21-20.02.21. R. Dharshana has done her internship at Golden hill tea plantation from 18-01-2021 to 30- 01-2021.
- M. Varnnapriya, R. Dharshana, R. Srimathi, Farhana Rasheed has done a course
- at IBM as IBM enterprise design thinking practitioner on 04-02-2021. Farhana Rasheed has done her internship at Midad water Pvt Ltd from 01 -12-2020 to 31- 01-2021.



MS. FARHANA RASHEED

Participated in:

- ❖ Online training course on Cloud services using AWS by pythoholic on 01/2021.
- ❖ Online training course on Personal nutrition course by Shaw academy on 01/2021.
- ❖ Online training course on Artificial intelligence with python by CS50 on 01/2021.

MR. SIDANE TOMS

Participated in:

- ❖ Webinar by PFNDAI on Licensing and registration system on 16-04-2021.
- ❖ FoSTaC level 2 manufacturing on 04-04-2021.
- ❖ Internship in Tantea 8th-12th February 2021.

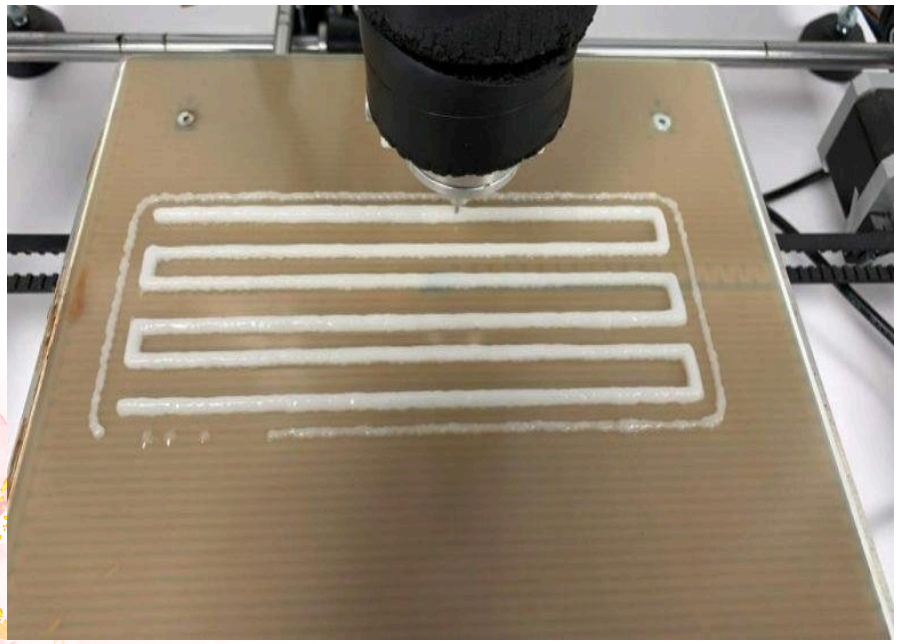
MS. SRIMATHI R

Participated in:

- Webinar on entrepreneur and job creation on 03-05-2021.
- Artificial intelligence with python by CS50 on 05-05-2021.

ARTICLE CORNER

FOOD REPLICATOR: RESEARCHERS CREATE INGREDIENTS TO PRODUCE FOOD BY 3D PRINTING



Food engineers in Brazil and France developed gels based on modified starch for use as “ink” to make foods and novel materials by additive manufacturing. Credit: Bianca C. Maniglia / USP It is already possible to produce food with a 3D printer, potentially delivering products that suit consumer preferences regarding taste, texture, cost, convenience, and nutrition. In the near future, it will be possible to produce food with personalized shapes, textures, flavors, and colors considered attractive and healthy for children and the elderly, for example. A group of researchers at the University of São Paulo’s Luiz de Queiroz College of Agriculture (ESALQ-USP) in Brazil, partnering with colleagues in France at Nantes Atlantic College of Veterinary Medicine, Food Science and Engineering (Oniris) and the National Institute for Research on Agriculture, Food and Environment (INRAE), have made strides toward achieving this goal. They are developing hydrogels based on modified starch for use as “ink” in 3D printing of foods. Recent results of the project, supported by FAPESP, are published in the journal Food Research International. The first gels produced by the researchers were based on cassava starch. They themselves developed the method used to modify the structure and properties of the starch with ozone during a previous project also supported by FAPESP.

They produced ozone by applying an electrical discharge to oxygen, bubbled the gas in a container with a mixture of water and cassava starch in suspension, and dried the mixture by removing the water. The result was modified starch.

By varying aspects of the process such as ozone concentration, temperature, and time, they were able to obtain gels with different properties in terms of the right consistency for use in 3D printing.

The ESALQ-USP group now plans to study other methods of modification and sources for the production of 3D food printing gels. ESALQ-USP has recently purchased a 3D printer, which they will use to produce the structures developed with the new gels.

The gels based on modified cassava and wheat starch can be used to print other things apart from food, such as biomedical products including drug capsules and nutraceuticals – foods designed not only to nourish but also to confer health benefits.

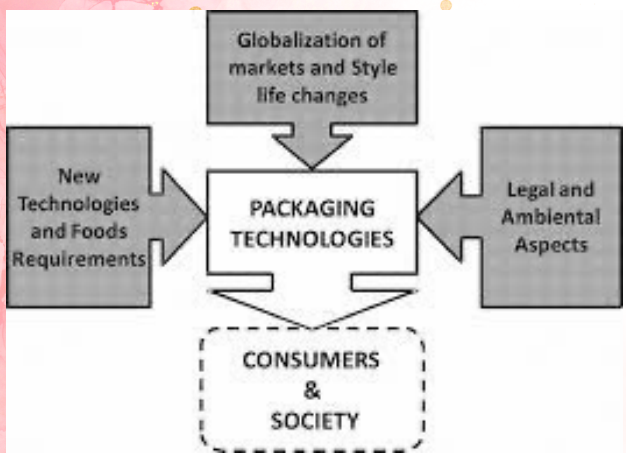
Samples of gel based on cassava and wheat starch were printed at Oniris and INRAE in France via a project to develop functional starch-based gels for 3D printing funded by the Pays de la Loire regional innovation agency under a program called “Food 4 tomorrow”.

Through the partnership with French scientists, ESALQ-USP researcher Bianca Chieregato Maniglia conducted postdoctoral research at Oniris and INRAE, applying the ozone and dry heating techniques to produce gels based on modified cassava and wheat starch for 3D printing of foods.

The techniques were developed with the collaboration of other researchers in ESALQ-USP’s Process Engineering Research Group (Ge^2P).

The ESALQ-USP group now plans to study other methods of modification and sources for the production of 3D food printing gels. ESALQ-USP has recently purchased a 3D printer, which they will use to produce the structures developed with the new gels.

The gels based on modified cassava and wheat starch can be used to print other things apart from food, such as biomedical products including drug capsules and nutraceuticals – foods designed not only to nourish but also to confer health benefits.



EDITORIAL

Melanie Brown
Editor

Interest in plant-based proteins has been taking off rapidly in the last 12 months as the numbers of consumers adopting vegan, vegetarian or flexitarian diets rises. Consumers have become increasingly aware of the link between dietary choice and climate change and this has become a primary concern for many. Food companies are responding to this opportunity by investigating new and traditional sources of plant protein to try to meet the burgeoning demand for meat free alternatives.

When developing new plant protein alternatives to meat products, it is important to ensure that functional, nutritional and sustainability attributes are delivered and that supply chain issues are considered at an early stage (p18). New metrics have been developed to assess the sustainability of new protein sources during new product development (p18).

Pea protein ingredients have a wide range of applications, including as alternatives to dairy proteins and as meat substitutes (p26). They have a lower cost than dairy proteins and can offer additional nutritional benefits, for example in satiety and weight management (p26).

New plant protein products must also deliver on taste. When the food industry uses, for example, pea proteins in sweet products, there can be a strong and unpleasant off-note that needs to be reduced using masking flavours (p26, p29).

Microalgae are a relatively new source of plant proteins and have the advantages that they can be produced in reactors on non-fertile land and can efficiently fix CO_2 from the atmosphere or from waste sources (p22). Some microalga strains contain very high concentrations of protein; they offer great potential for the future.

A variety of sources of plant protein are taking off as meat and dairy alternatives. Shifting towards more flexitarian diets could help to reduce pressure on land and carbon emissions from intensive livestock production.

email mb@biophase.co.uk

Letters to the editor about any of the articles published in Food Science and Technology are welcomed.

Vegan alternatives to animal-based proteins

The rise in veganism and flexitarian diets requires products to be free from animal-based ingredients. The food industry is responding by seeking to develop or reformulate products with plant-based protein ingredients. Campden BRI has begun research into developing techniques to help the food industry produce cost-effective protein-rich ingredients from plants[1].

As a precursor to the technical research, Campden BRI surveyed members of the food and drink industry to establish what their biggest challenges were when using plant-based proteins in their products. Common responses included concerns over protein content, quality, increased ingredient or processing costs, longer ingredients lists and the potentially unpleasant taste of plant-based proteins. However, protein functionality was their overriding concern.

Protein functionality plays a key role in product development and consumer appeal. Egg, for example, is a unique multi-functional ingredient that is used for aeration, emulsification, enriching, colour, shine and structure formation. Replacing this ingredient is, understandably, difficult for manufacturers.

However, according to Ingredients research team leader, Tiia Morsky, work at Campden has found that pulses - such as peas, beans and lentils – display great functional properties with significantly higher foam expansion and foam volume stability when compared to egg white proteins.

The research will compare different processing techniques and parameters, such as equipment, time and temperature, to understand the impact they have on yield and protein functionality. The project then aims to optimise the nutritional value and technical performance of these ingredients – providing manufacturers with more plant-based protein options.

Common sources of plant proteins are pea, soy and gluten, but these come with concerns over allergies, impact on flavour and sustainability. Campden is looking into protein derived from microalgae, a relatively new ingredient, and chickpeas, which are widely availability and scored well in a consumer survey.

Over the next two years the project will assess more plant-based ingredients to determine how they perform in meat and dairy alternatives and bakery products.

EDITORIAL BOARD

STUDENT EDITORS

MS. NIHARIKA BIPIN - III FT &
MR. HARI PRASAD - II FT
(II B.Tech. Food Technology)

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(Assistant Professor)

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