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# FFI

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## ***“FIDUCIARY OF FOOD INNOVATION”***









### ***VISION***

*“To be an excellent department in training students to become professional Food Technologist who is technically capable of working in food operations sector and Discovering licensed food products which could Benefit the eco-friendly society”.*

### ***MISSION***

- 1. To impart students with vibrant technical and analytical skills.*
- 2. To provide students with leadership quality and also the knowledge to handle all the problems relating food industry.*
- 3. To develop the research and development activities of students to explore the quality.*

# TABLE OF INGREDIENTS

 <b>Staff Achievements.....</b>	<b>3</b>
 <b>Webinar\Seminar organized in the campus.....</b>	<b>4</b>
 <b>Faculties Participation.....</b>	<b>6</b>
 <b>Student Association Inauguration.....</b>	<b>7</b>
 <b>Students Achievement.....</b>	<b>8</b>
 <b>Article Corner.....</b>	<b>11</b>

# STAFF ACHIEVEMENTS

Dr Jeevarathinam G (Assistant Professor 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.



Dr Jeevarathinam G (Assistant Professor 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.

The image shows a screenshot of a journal article page from LWT (Food Science and Technology). The article title is "Microencapsulation of bixin pigment by spray drying: Evaluation of characteristics". The authors listed are M. Balakrishnan, S. Gayathiri, P. Preetha, R. Pandiselvam, G. Jeevarathinam, and D.S. Aniesrani Delfiya. The abstract discusses the microencapsulation of bixin pigment from annatto extract using spray drying. The highest encapsulation efficiency (86.37%) was recorded for commercial annatto extract microcapsules. The encapsulated particles were spherical, with sizes ranging from 1 to 7.2 μm. The microcapsules showed high stability against light, oxygen, and heat.

**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

**HINDUSTHAN**  
COLLEGE OF ENGINEERING AND TECHNOLOGY  
(An Autonomous Institution)  
Valley Campus, Pollachi Highway, Coimbatore – 641032.  
www.hicet.ac.in

**Department of Food Technology**  
in association with  
**FFI (Fiduciary of Food Innovations)**  
A student's Association of Food Technology  
Invites you all for the international webinar on  
**"Food Technology & Its Myriad of Opportunities for a Prospective Career"**

Date : 01.03.2021 Time:11.30 am – 12.30 pm

**Er. Madhu Kaiwara Narayanaswamy**  
Team Manager - Processing  
Almarai.Co  
Saudi Arabia

Coordinator(s)  
Ms.Princy N, AP/FT  
Mrs.Nageswari G, AP/FT

Convenor  
Dr. Seenuvasan M,  
HoD/FT

CEO & Principal  
Dr.Karunakaran K

Join us Live on Google Meet  
<https://meet.google.com/ryd-trjd-yat>

- ❖ 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.

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**INSTITUTION'S INNOVATION COUNCIL**

**Department of Food Technology**

**IIC Driven Activity**  
webinar on  
**"My Entrepreneurship Journey"**

Date : 09.03.2021 Time:11.00 am – 12.00 pm

**Dr. Arun Viswanathan S K**  
Founder of Chitra'm Craft Chocolates  
Director, Infusion Café  
Co-Founder, Ganache chocolates

Coordinator(s)  
Mrs.Nageswari G, AP/FT  
Ms.Princy N, AP/FT

Convenor  
Dr. Seenuvasan M,  
HoD/FT

CEO & Principal  
Dr.Karunakaran K

Join us Live on Google Meet  
<https://meet.google.com/stx-xwbh-mtp>

- ❖ 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.

**Department of Food technology**  
In Association with  
**FFI (Fiduciary of Food Innovations)**  
an Association of Food Technology Students

We cordially invite you all for  
International Webinar on  
Introduction on High Pressure Processing and Scope of Food Processing

**26/02/2021**  
**0.30AM -11.30AM**





**Hindusthan College of  
Engineering and Technology**

Guest Speaker  
**Ms Hozen Ricchie Rose**  
Graduate Assistant  
Department of Food Science  
University of Arkansas (USA)

**Join Us google meet : [https:// meet.google.com/vpi-fvkd-mzd](https://meet.google.com/vpi-fvkd-mzd)**

<b>Convenor</b>	<b>Co-ordinator</b>	<b>CEO &amp; Principal</b>
Dr Seenivasan M, HOD/FT	Mr Dillwyn S, AP/FT	Dr Karunakaran K

## 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
<b>Mrs Swathi K</b>	AI for Everyone
	Positive psychology
	Food and Beverage Management
	Transformation of Global Food System
	Novel Technologies for food processing and shelf life extension
<b>Mr Dillwyn S</b>	AI for Everyone
	Positive Psychology
	Transformation of Global Food System
	Advanced Instructional Strategies in the Virtual Classroom
<b>Dr Jeevarathinam G</b>	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

**IIC SELF DRIVEN ACTIVITY** 

We cordially invite you all for the  
Webinar on  
“Entrepreneurship and careers  
beyond opportunities in Food Processing Sector”

**13/02/2021**  
**3.30PM - 4.30PM**



**Department of Food  
Technology**



**Hindusthan College of  
Engineering and Technology**

Chief Guest  
**Dr Shivaraj G**  
Manager  
Media.net  
Early talent acquisition (India)

**Join Us google meet : <https://meet.google.com/taf-rhav-xjc>**

<p>Convenors</p> <p>Dr. Seenuvasan M, HOD/FT</p> <p>Dr Jeevarathinam G, AP/FT</p>	<p>Co-ordinators</p> <p>Mr Dillwyn S, AP/FT</p> <p>Ms Princy N, AP/FT</p>	<p>CEO &amp; Principal</p> <p>Dr Karunakaran K</p>
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## 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.



### WHAT IS 3D FOOD PRINTING?

- It is additive manufacturing process wherein food material is printed in layers to come up with a certain pre-determined taste, texture, nutrition

**Are 3D food printers available?**

- Yes, there are many food printers available and they usually used to print chocolates, mousse and pancakes, among others

### EXPERT SPEAKS

3D printing offers many opportunities from the standpoint of personalisation, food fortification and presentation. Additive technologies provide precision, hygiene, automation and productivity advantages that can also result in execution effectiveness. It is an evolving domain and can augment experience and unit level economics in street food and out of home consumption in India

—Anand Ramanathan |  
PARTNER, DELOITTE INDIA



### So, what is the challenge?

- The challenge is to make a wide variety of food 3D printable and machines that support such activities

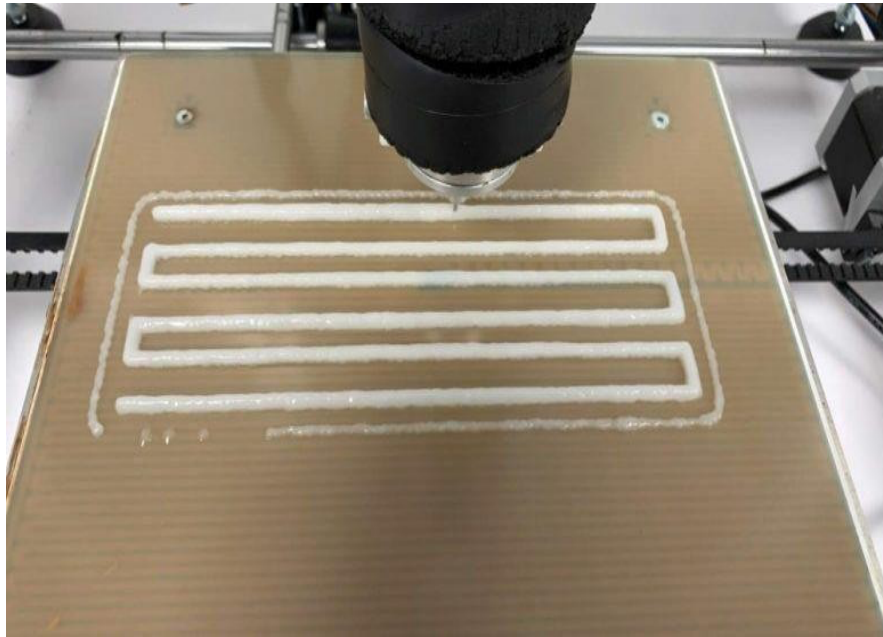
### Do you know?

- There are many restaurants that serve 3D printed food internationally



## 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.

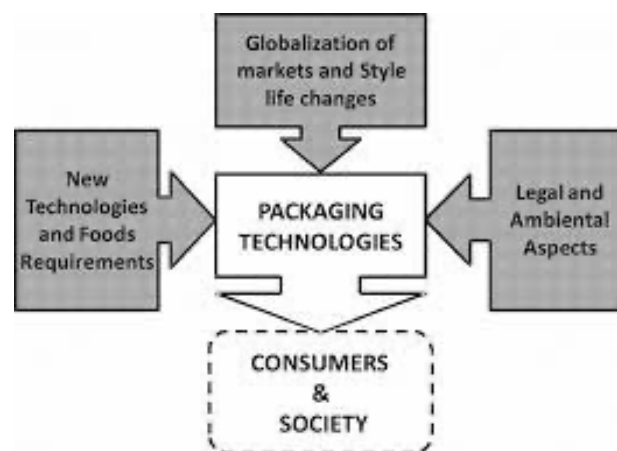
Samples of gel based on cassava and wheat starch were printed at Oniris and INRAE in France via a project to develop functional starch-based gels for 3D printing funded by the Pays de la Loire regional innovation agency under a program called “Food 4 tomorrow”.

Through the partnership with French scientists, ESALQ-USP researcher Bianca Chieragato 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<sup>2</sup>P).

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<sub>2</sub> 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.

[emailmb@biophase.co.uk](mailto:emailmb@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<sup>[1]</sup>.

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 available 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. VARNNA PRIYA M*

**&**

*Ms. DHARSHANA R*

**(III Food Technology)**

## **COORDINATOR**

*MR. DILLWYN S*

**(Assistant Professor)**

## **CONVENOR**

*DR. SEENUVASAN M*

**(Professor & Head)**



**THE ARTS ARE THE SALT OF THE  
EARTH;  
AS SALT RELATES TO FOOD, THE  
ARTS RELATE TO TECHNOLOGY**

**-JOHANN  
WOLFGANG  
VON  
GOETHE**

**HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY**

**(AN AUTONOMOUS INSTITUTION)**

**DEPARTMENT OF FOOD TECHNOLOGY**

