

NEWSLETTER

Project news:

NAMASTE – EU -Main outcomes on the valorisation citrus by-products and bran

Citrus by-products valorisation

After the good results obtained in the stabilisation of citrus by-products several prototypes of citrus fibre from lemon and orange have been obtained. The main challenge has been producing a fibre with neutral flavour and colour, and with good technological properties, which has been achieved through several steps of blanching and de-bittering using solid-liquid solvent extraction. A fraction rich in polyphenols and carotenoids was obtained as co-product of the same process. In parallel, an enzymatic process for obtaining peel extracts has been assayed, which products can be used in the formulation of fruit based beverages. All these products are being characterized and assayed in the formulation of test food systems. Technical specifications sheets have been defined and developed for each of the NAMASTE food ingredients as well as for the new final food products which are yet in course of being developed. These include a complete product description which will be used as reference during the design and developmental stage.

New foods based on citrus by-products

The process and formulation of fruit juices based on citrus fibre and peel have been optimized by means of an experimental design exploring the effects of different variables (A_w , thermal process, sugar content) on the shelf-life of the fruit juices. Technical specifications regarding the process and the new products composition have been defined.





Wheat bran valorisation

In order to transform wheat bran into a functional ingredient to be used in the formulation of extruded and breakfast snacks, it has been pre-treated with enzymes and then fermented with *Bifidobacterium longum*, *Lactobacillus rhamnosus*, *Lactobacillus plantarum* or *Lactobacillus sakei*. The pre-fermented brans have been dehydrated in order to obtain stable ingredients. The fermentation prevented the chemical spoilage of the dehydrated ingredients by inhibiting the lipid oxidation and enhanced the antioxidant properties of the fibre. On the basis of these results standardized protocols for fermentation and dehydration have been prepared.

Expert panel

One of the specific objectives of NAMASTE project is to guarantee the transferability of the results by evaluating the technical, environmental and economic feasibility of the proposed developments. For this purpose an external advisory expert panel is being constituted which will meet the members of the executive board to help in the evaluation as well as in defining the best options for the exploitation of the results. The expert panel will be composed of 5-6 stakeholders from complementary disciplines: environmental sciences, food safety, food legislation, logistics & commercialisation as well as by-product generators and potential end users. The expert panel composition is still open for proposals.

NAMASTE-India – Main outcomes of extracts & products developed at this stage of the project

Rice Bran

Rice bran is commonly used as plant carbohydrate source in the formulation of carp feeds in the country. Of late, rice bran is extensively being used for extraction of edible oil and for animal feed and hence has necessitated for exploring new alternative plant carbohydrate sources.

Natural extracts such as Dietary fiber and Natural Food colour from Pigmented Rice bran could be extracted from Rice Bran. Dietary fiber is the edible parts of plants or analogous carbohydrate that are resistant to digestion and absorption in human small intestine with complete or partial fermentation in the large intestine. Natural Food colour from Pigmented Rice bran has greater antioxidant value than normal rice bran extract from long grain white rice.

Mango & Pomegranate

Mango and pomegranate peels are the processed by-products the country is generating in huge quantity and warrants for alternative use. These contain several bioactive compounds of health benefits to mankind. Peels of both mango and pomegranate are highly perishable and extractions of bioactive compounds from them require increased shelf life. Water blanching was found to be superior for stabilization of peel material and protocols have been standardized for effective stabilization. The heavy metal concentration in mango peel was within the limits compared to pomegranate peel.

Natural extracts of polyphenols, pectin and dietary fibre from mango peel were obtained. They were incorporated in development of in jam, biscuits and beverages at different levels.

Feed from grain and fruits by-products

Rice bran and ground nut cake mixture in different proportion are commonly used as feed in freshwater fish farming in the country. Of late, rice bran is extensively being used for extraction of edible oil and for animal feed. In the backdrop of the processing fruit by-products such as Mango peel, Mango kernel, Pomegranate peel, Orange peel etc. and their non-exploited fractions after biochemical extraction (Protein, polyphenol, pectin) could be a better alternative as carbohydrate source.

Presentation of NAMASTE project at other events

- ***Campden Day, Hungary***

The NAMASTE project was presented on the Campden BRI Day Hungary, which is organized annually and attracts participants from the Hungarian food industry and policy-makers. The event gave an overview of the potential application of future internet in the food industry and he emphasized the importance of transparency and sustainability of the food sector.

- ***2011 EFFoST Annual Meeting (Berlin/Germany)***

The EFFoST Annual Meeting was held Berlin. The main focus was on the interaction between process, structure and functions of food systems. The results of the NAMASTE project - the pre-treatment and stabilization of citrus by-products- were explained to the audience.

- ***6th European Symposium of Enzymes in Grain Processing (Copenhagen/Denmark)***

The European Symposium of Enzymes in Grain Processing is a forum where researchers and technologists from academia and industry share recent progress and exchange ideas that will direct future use of enzymes in grain processing. An introductory overview of NAMASTE and outcomes of pre-treatment and recovery of natural constituents from wheat bran was presented on the event.

- ***AIJN-EQCS Workshop (Brussels/Belgium)***

The International Association of Fruit Juices and Nectars (AIJN) and the European Quality Control System for Fruit Juices and Nectars (EQCS) celebrated their annual workshop last October 13th in Brussels. In the Workshop different technical issues and opportunities for the fruit producing sector were presented. One of the topics was the update on research projects, under which the NAMASTE project was shown.

- ***Food for Life European Platform meeting (Bonn/Germany)***

The 10th Meeting of National Technology Platforms integrated in the ETP “Food for Life” met in Bonn on November 2nd, where the NAMASTE project was presented, as an interesting approach to obtain added valued products from by-products of the food industry.

- **Info day on 7th framework programme- FAFB - August 2011, Chennai**

The NAMASTE project was presented at the round table session of Info day on 7th framework programme - FAFB conducted by Biocircle2 project at Chennai. The Biocircle2 project aims to further increase the participation of researchers from outside Europe in research projects under the FAFB theme. This FAFB info day attracted 45 to 50 participants from both academia and industry. NAMASTE project brochures were also distributed to the participants.



- **Environment Business & Research Delegation to Bangalore - 14 – 18 November 2011, Taj West End**

The NAMASTE project was presented at the event of Environment Business & Research Delegation. This event was co-organised with the Bangalore Chamber of Industry and Commerce (BCIC). The purpose of the delegation is to allow European delegates to understand the Indian environment market, Indian research projects and explore business opportunities. This event also emphasised on EU Indian “Research and development opportunities”. NAMASTE project was presented and brochures were also distributed to the participants.

Approaches on waste prevention / management

Waste Management in India: “Wastes” are materials which are discarded after use at the end of their intended life-span. Waste management is a collective activity involving segregation, collection, transportation, re-processing, recycling and disposal of various types of wastes. Sustainable waste management involves managing waste in an environmentally sound, socially satisfactory and a techno-economically viable manner. The Ministry of Environment and Forests (MoEF), Government of India constituted a Committee for the Management of Waste in India.

It is suggested that an overall national or regional waste policy should govern the multiple activities in the waste sector. A clear, concise and consistent policy has been set up for necessary requirement for the waste industry to establish and set up waste management systems and make necessary investments. Policy has been backed by legislations for all kinds of waste spelling out clear penalty for violations. Some recommendations are:

- A specific policy for the management of wastes in India, incorporating the internationally accepted hierarchy for management of wastes should be framed.
- Laws/rules for the management of all major kinds of waste like construction & demolition waste, end of life vehicles, packaging waste, mining waste, agriculture waste and e-waste.
- It was proposed to manage a nodal body to guide monitor and train personnel for managing all kinds of waste at the Central level.
- All the states in India should be involved in this exercise so that a comprehensive database on waste is generated for aiding policy-making and intervention.
- Ministry of Environment Forest (MoEF) may carry out waste related pollution impact monitoring, on a regular basis, to study the effects of improper disposal of waste on the environment.
- The management of E-waste is taken up at three levels, viz. Legislative, Administrative and Technological measures.

Waste Management in the European Union:

EU waste management policies aim to reduce the environmental and health impacts of waste and improve Europe's resource efficiency. Waste arises throughout the supply chain from the agricultural activities and manufacturing down to the household consumption, therefore the supply chain concept is essential. The long-term goal is to turn Europe into a recycling society, avoiding waste and using unavoidable waste as a resource wherever possible. The European Union's approach to waste management is based on three principles:

- **Waste prevention** is a key factor. Food waste at the manufacturing sector is unavoidable; therefore there is a need to make manufacturers responsible for the waste they produce. Waste prevention is closely linked with improving manufacturing methods. Besides it is important to encourage consumers to reduce waste and food losses in their household.

- **Recycling and reuse** need to be promoted if waste cannot be prevented. EU directives require Member States to introduce legislation on waste collection, reuse, recycling and disposal of specific waste streams (e.g.: packaging, end-of-life-vehicles, electrical and electronic waste).
- **Improving final disposal** is essential; the landfill should be used as a last resort. The EU recently approved a directive setting strict guideline for the landfill management. If the waste cannot be recycled or reused it should be safely incinerated. Another recent directive lays down strict guidelines on emission levels from incinerators.

Find more information: <http://ec.europa.eu/environment/waste/>

Information on related EU and India FP7 projects:

- **EcoBioCap - Ecoefficient Biodegradable Composite Advanced Packaging**
Within the EcoBioCAP FP7 project a next generation packaging will be developed using advanced composite structures based on constituents derived from the food industry by-products only and by applying innovative processing strategies to enable customisation of the packaging properties to fit the functional, cost, safety and environmental impact requirements of the targeted fresh perishable food. The overall objective of EcoBioCAP is to provide the EU food industry with customizable, ecoefficient, biodegradable packaging solutions with direct benefits both for the environment and EU consumers in terms of food quality and safety. EcoBioCap supports the development of biodegradable food packaging from food industry by-products and address food and packaging European competitiveness while ensuring consumer and environmental safety.
- **TRANSPARENT FOOD - Quality and integrity in food: a challenge for chain communication and transparency research**
The overall objective of the TRANSPARENT_FOOD Project is to contribute to the development of transparency in the sector by supporting understanding of its complexities, identifying the present state-of-the-art, learning from experiences, making stakeholders aware of specifying deficiencies and research needs, and formulating a research framework for facilitating future research initiatives.

It was established that a major part of the best practices of transparency is commonly applicable for all transparency domains and only a small part of them is domain specific. A framework was developed for analysis of best practices of transparency, which is the basis of formulation of a best practice guide. The objective of the guide is to integrate the knowledge from the different work packages of Transparent_Food, dealing with different aspects and domains of transparency systems, by using a process based approach to describe the successful practices on meeting transparency expectations and needs of the recipients (consumers, businesses and policy makers/authorities); and on integrating appropriate and true information into transparency schemes to ensure informed decisions of the recipients to prove the verity of claims and statements.

- **CLEANFEED – Vegetable waste generation prevention and reuse for animal feed in the Autonomous Community of the Basque Country.**

The project aims to reuse more than 70% of the vegetable wastes generated in distribution and retailer's facilities (about 7.000 tonnes a year of fruits and vegetables) by applying a methodology that it is transferable to other European countries with a similar environmental problem. The project will elaborate a detailed inventory of the vegetable wastes, to define the technologies necessary to produce animal feed with the vegetable by-products and to have a demonstration at real scale of the proposed new methodology and to include the new raw material in the animal feed catalogue of the European Commission.

- **SENSE – Harmonised Environmental Sustainability in the European food and drink chain**

The main objective of SENSE is to deliver a harmonised system for environmental impact assessment of food and drink products, by evaluating existing relevant environmental impact assessment methodologies and considering socio-economical, quality and safety aspects. The proposed harmonised environmental impact assessment system will integrate a data gathering system, a matrix of key environmental performance indicators, a methodology to environmental impact assessment and a certification scheme. The methodology will be transferred to food and drink sector stakeholder of the food supply chain.

Up-coming events

- **Alimentaria International Food and Drinks Trade Fair.** Barcelona Spain, 26-29 March 2012.
- **Environmental Microbiology and Biotechnology in the frame of the Knowledge-Based Bio and Green Economy (EMB2012)** - Bologna, Italy, April 10-12, 2012
- **CEFood 2012, the 6th Central European Congress on Food** - Novi Sad, Serbia, 23- 26 May 2012.
- **Campden BRI Day**, Chipping Campden, UK 06. 2012.
- **XXVIth International Conference on Polyphenols in Florence**, Italy from July 22nd to 26th 2012.
- **Food Forum India** – Mumbai, India, 27-28 March 2012
- **7th Nutra India Summit 2012** – Bangalore, India 15 - 17 March 2012
- **Bangalore India Bio** – Bangalore, India, 6-8 February 2012
- **Agro vision** – “Building sustainable livelihoods & increasing farmer’s income” Nagpur, India, 27-30 January 2012

Staff Exchange Programme (SEP)

SEP is involved between both NAMASTE twin consortia i.e. NAMASTE EU & NAMASTE INDIA. The main aim of this programme is to favour the knowledge and RTD sharing between two consortia and the development of common/integrated protocols, strategies and technologies ; increase the scientific skills of researchers; promote interdisciplinary, and transnational scientific growth of scientists; enhances distribution of knowledge between the EU and India continents. Also, some visits to industries of common interest will be made during the exchange programme.

From NAMASTE –India project, the following 3 people have been participating in the SEP programme.

<i>Indian Scientist Participating</i>	<i>HOST EU organization</i>
Prof. Aradhana Goswami - NEIST	IFR – Mr. Jim Robertson & UNIBO- Mrs. Elizabetta Guzeroni
Prof. Tobiul Hussain Ahmed- NEIST	IFR – Mr. Jim Robertson
Prof. Chandru – UAS-B	AZTI – Mr. Carlos Bald

Meet the NAMASTE project partners!

The Institute of Food Research



The Institute of Food Research (IFR), www.ifr.ac.uk, was created in November 1986 and is part of the Norwich Research Park (NRP), www.nrp.org.uk. IFR can trace its origins back some 90 years to the Low Temperature Research Station in Cambridge and the National Institute for Research in Dairying. Since 1968 there has been a Laboratory based at Norwich and IFR is one of 8 Research Institutes that receive strategic funding from the Biotechnology and Biological Sciences Research Council (BBSRC), www.bbsrc.ac.uk. Funding is supplemented through success in competitive grant applications at national and international level.

The mission of the Institute is to undertake international quality scientific research relevant to food and human health and to work in partnership with others, at national and international level, in research, business, industry and the wider community; to provide underpinning science for consumers, policy makers, the food industry and academia. The research underpins key sectors of the UK economy such as agriculture, bioenergy, biotechnology, food and drink and pharmaceuticals.

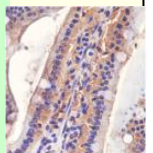
IFR research maps closely onto the BBSRC key strategic research priorities:

- **Food Security** *bioscience for a sustainable supply of sufficient, affordable, nutritious and safe food, adapting to a rapidly changing world*
- **Basic bioscience underpinning health** *driving advances for better health across the life course and improved quality of life, reducing the need for medical and social intervention*
- **Bioenergy and industrial biotechnology** *biofuels and industrial materials from novel biological sources, reducing dependency on petrochemicals and helping the UK to become a low carbon economy*

IFR Research Themes are:

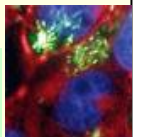
Integrated Biology of the Gastro Intestinal Tract

We aim to understand how the major components of the GI Tract - the bacteria, the epithelial cells lining the gut, and the immune system interact to preserve gut health. This will help explain how and why these interactions go wrong in chronic disorders such as food allergy, inflammatory bowel disease and colorectal cancer.



Foodborne Bacterial Pathogens

Foodborne bacterial pathogens continue to cause public health and economic concerns in the UK and worldwide. Our research combines mathematical biology with experimental science to answer



fundamental questions and to deliver scientifically exciting and applicable outputs aimed at removing pathogens from the food chain and generating savings for the health service.

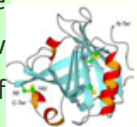
Plant Natural Products and Health

Some key plant natural products are associated with potential health benefits. Our research extends from their synthesis and accumulation in plants, through their metabolism and excretion in humans, their biological interactions with human tissues and resultant downstream effects upon health. Collaboration with plant scientists and clinically-orientated researchers is a key feature.



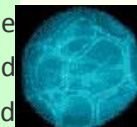
Food Structure and Health

To help prevent diet-related conditions such as obesity, diabetes, allergy and some cancers we need to maximise the nutritional benefit of the food we eat. Scientists at IFR are discovering how the structure of food responds to the gut environment and how this in turn affects the digestion of food, release and uptake of nutrients.



Sustainability in the Food Chain

To seek to enhance the exploitation of food-chain residues and co-products through developing a greater understanding of how to disassemble plant structures to recover value-added marketable ingredients and to produce biofuels. SFC contributes to local initiatives e.g. Innovation in Non-Food Crops and the Sustainable Agriculture and Land Use challenge and runs the Biorefinery Centre based at IFR.



Some current and recent Projects in SFC are:

DISCO (Targeted DISCOvery of novel cellulases and hemicellulases and their reaction mechanisms for hydrolysis of lignocellulosic biomass)

HOOCH (Production of bioalcohols from lignocellulosic waste materials produced in the agri-food chain)

IBTI (Optimization of Wheat and Oilseed Rape Straw Co-products for Bio-alcohol Production)

NAMASTE (New Advances in the integrated Management of food processing wAste in India and Europe: use of Sustainable Technologies for the Exploitation of by-products into new foods and feeds)

NOVELO (Novel Processing Methods for the Production and Distribution of High-Quality and Safe Foods)

HEALTHY STRUCTURING (Nutritional and Structural Design of Natural Foods for Health and Vitality)

COMPEAT (A Growing Media Peat Replacement from Composted Food-Processing Waste)

REPRO: (Reducing Food Processing Waste)

EIRC Consulting Private Limited (EIRC) / Euro-India Research Centre (EIRC)

EIRC is a research and management consultancy company based in Bangalore, India with cross-sectoral expertise in varied industrial & technological segments such as Information Technology, Aerospace, Energy, Environment, Pharmaceutical, Biotechnology & Medical Equipment. EIRC facilitates research and business collaboration between India and Europe through comprehensive training and consulting services. EIRC through its renowned web portal www.euroindiaresearch.org is not just a guide and a mentor to the Indian researchers on European funding programmes for research and development it is also the gateway for many European organizations for entry into India. Within the Framework Programme (FP), EIRC Consulting provides comprehensive services to Indian & European stakeholders such as awareness raising, assistance in liaising and networking, developing partnerships, project management consultancy, training, dissemination and also uptake of projects results. EIRC is also the coordinator of the FP7 National Contact Point (NCP) network for ICT in India and it helps the network facilitate the Indian scientific and research communities to participate in FP7. EIRC is in constant interaction with the Ministry of Information and Communication Technology (MCIT) Government of India, sharing information and holding discussions on developments in Indian participation in the FP.

EIRC is actively working towards establishing NCPs for Space and Environment Sectors and is regularly pursuing with the Ministries and relevant agencies in both the regions. EIRC's organizational expertise has the right temperament, experience, and is ideally placed to act as a launch pad to build research and technology linkages.

The team is composed of consultants with both general and technical knowledge of specific industry niches. Their focus and experience in specific industries ensure a wholesome consultation and result-oriented engagement.

EIRC was the Regional Antennae for EBTC in Bangalore and is a shareholder of EUROPEAN BUSINESS AND TECHNOLOGY CENTRE (EBTC).

EIRC facilitates new scientific partnerships and catalyze budding collaborations between academia, industry research establishments and businesses between India and Europe through the following services:

- Project partner search for both European and Indian organisations
- Road-mapping organisational competencies against FP priorities
- Benchmarking of project ideas against relevant past and current frontier research
- Expert assistance in the assessment of proposed project ideas
- Regular workshops on phases between project idea and proposal submission
- Periodic training on proposal writing and budget outlining
- Consulting services in the areas of project management, administrative co-ordination, financial reporting and dissemination requirements

EIRC's current projects:

Synchroniser: Through this project we aim to increase the policy dialogue between EU and India in ICT and S&T sectors through appropriate forms of involvement of the scientific communities and stakeholders. This project provides research dimension to the existing priorities and identifying long term research perspective and areas for co-funding opportunities.

India-Gate: The main objective of the project is to increase the S&T cooperation between India and the EU by creating a “one-stop shop” for funding opportunities that are available in India for European organisations. In this project, we aim to identify the innovation landscape and capacity in India, with special emphasis on the mechanisms that support cooperation to understand the impact of existing activities, measures, establishments with regards to further boosting innovation in the future with the EU.

Namaste-India: We are the first private organization to have bagged this prestigious EU-India joint call project in the Biotechnology sector as an Management and Coordination partners funded by the Department of Biotechnology, Government of India. The project aims at developing eco-efficient processes leading to the valorization of by-products on the basis of a strategy dealing with the formulation and characterization of new foods (fiber-based foods and functional beverage) and a feed for fish.

EIRC's Indian Project Partners: ITSMA, IISc, IIIT – B, CDAC Pune/Delhi/Bangalore, RMG, IIFT, IIT- Bombay, IIT-Chennai , CSIR, NEIST, UAS-B and many others.

EIRC's European Project Partners: Teseo, Belgium; GAIA, Spain; FILAS, Italy; APRE, Italy; EuropaMedia, Hungary; ZSI, Austria; FORTH, Greece; FhG, Germany; ROSE, Spain.

EIRC's Clients: IBM; Infosys; Wipro; Ktwo Technologies; Cranes Software and SLN Technologies and many others.

Ms. Surbhi Sharma is a Director of EIRC Consulting Private Limited (EIRC). She is the Administrative Coordinator for NAMASTE-India project. She started her professional career as an entrepreneur in 1995. Since 1999, she has participated in European Union funded projects and is very experienced in assisting European clients to establish in India. She has pioneered the setup of the National Contact Point of the ICT program in India and is responsible for successful dissemination of EU programs in India. Ms Sharma is also the Co-promoter of the European Technology Parks and is on the Advisory Board of several companies. Ms Sharma is also the Secretary General of the International Federation of Multimedia Associations. Ms Sharma is a frequent speaker at conferences throughout the world. Her experience of working with various governments, funding agencies and the private sector, has helped EIRC in developing better public private strategies that benefit their clients tremendously. She is Honorary Counsel General for Spain in India.