



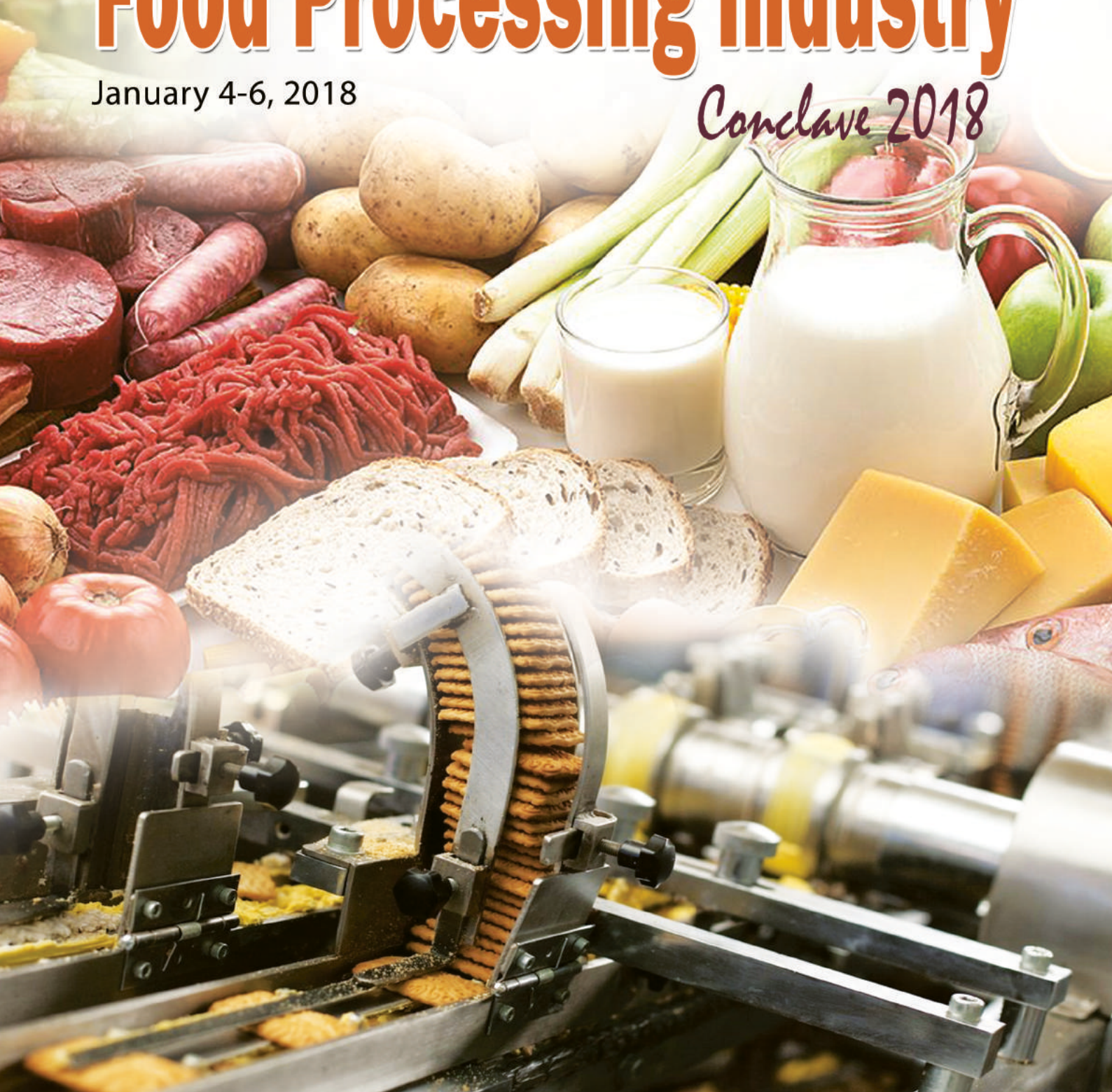
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The Federation of Telangana and Andhra Pradesh Chambers of Commerce and Industry

Food Processing Industry

January 4-6, 2018

Conclave 2018



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FTAPCCI FOOD PROCESSING INDUSTRY *Conclave 2018*

January 4th , 5th & 6th - 2018

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CHIEF MINISTER
ANDHRA PRADESH

MESSAGE

I am happy to know that FTAPCCI is organizing “Food Processing Industry Conclave 2018” on 4 to 6 January 2018.

I appreciate the initiative of FTAPCCI to deliberate on ways to boost food processing industry as an “Engine for generation of Employment” in the State.

The sunrise state of Andhra Pradesh is envisaging to be global leader in food processing domain by agri and allied produce enhancement, increasing efficiency, waste minimization, institutions, governance and institutional support by 2029 and I appreciate the efforts of each and everyone in this direction.

I would like to convey my best wishes to FTAPCCI on the upcoming Food Processing Industry Conclave from 4th to 6th January, 2018

A handwritten signature in black ink, appearing to be 'N. Chandrababu Naidu'.

(NARA CHANDRA BABU NAIDU)

DINESH KUMAR, I.A.S.



CHIEF SECRETARY

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Dt: 01-01-2018

MESSAGE

I am happy to note that the Federation of Telangana & Andhra Pradesh Chamber of Commerce and Industry is holding the "Food Processing Industry Conclave 2018" from 4-6 January, 2018 in Vijayawada. This is being held at a crucial time when India's desire to achieve food security to all and zero hunger by 2025. Food processing provides for value addition to primary food products and protect the farmers from post-harvest losses.

Andhra Pradesh, the Sun Rise State, has immense growth potential in food processing sector. With 5 agro-climatic zones, abundant raw materials, excellent infrastructure, second largest coastline in the country, 1 major and 14 non-major sea ports the State is poised to become leader of the country in agri and food processing sector. The state offers immense opportunities for investors along entire food value chain.

The Government of Andhra Pradesh has identified Food Processing Sector as one of the thrust areas and has taken several initiatives to promote food processing industry. The state is able to attract large investments but there is still untapped potential to be utilized.

We appreciate the efforts of the Federation of Telangana and Andhra Pradesh Chambers of Commerce and Industry in organizing this "Conclave on Food Processing Industry" in A.P., one of the best investment destinations for food processing sector in the country, from 4th to 6th January 2018.

The Conference cum Exhibition is timely and important for the growth of the Food Processing Sector in the State. I extend my best wishes for the success of the Conclave.


(Dinesh Kumar)

M. GIRIJA SHANKAR, IAS
Secretary to Government &
Chairman, APFPS



INDUSTRIES & COMMERCE DEPARTMENT
Food Processing & Sugar
Government of Andhra Pradesh

MESSAGE

(Secretary to CM and Prl Secretary to Food Processing Industry)

I am pleased to note that FTAPCCI is organizing "Food Processing Industry Conclave 2018" at Vijayawada from January 4 to 6, 2018.

The efficient food processing industry could contribute to the nation's food security. For instance the postharvest loss of selected fruits and vegetables is about 25 to 30 percent in our country. Even marginal reduction in these losses is bound to give us better returns and thereby improve the income level of the farmers while improving the availability of food to the consumer.

The government of AP, realizing the need for policy intervention and field level changes for rapid growth of food processing sector formulated policy not only for food processing but also for every sub-sector to develop global competitiveness.

The GoAP is promoting the Integrated Food Parks under IFP Scheme across all Districts of the State to provide modern infrastructure facilities for the food processing along the value chain from the farm to the market.

Food processing industry has ample opportunities for growth; but there is a need to focus on product conformity with global standards and quality, logistics and safety, quality of packaging and delivery. There is lot of scope for improvement in these areas and I am sure that the deliberations during the technical sessions of the conference will throw more light in these areas for the benefit of the entrepreneurs.

I appreciate the efforts of FTAPCCI in organizing the Conclave and I wish them all success!

Yours sincerely,


(M. Girija Shankar)



MESSAGE

I am immensely happy that FTAPCCI is organizing a three day “Food Processing Industry Conclave 2018” at Vijayawada from 4th to 6th January

The Indian food industry is increasing its contribution to world food trade every year and poised for huge growth. The food sector has emerged as a high-growth and high-profit sector due to its immense potential for value addition, particularly within the food processing industry.

Accounting for about 32 per cent of the country’s total food market, The Government of India has been instrumental in the growth and development of the food processing industry

Andhra Pradesh, India’s Sunrise State is a major contributor to Indian food sector and is aiming to achieve Rs 5000 crore investment and creation of 50000 jobs by 2020. Keeping in view the high potential of AP in food industry I am confident that the policy targets are reached.

Rapid urbanisation, changing of life style, increase in number of women work force, rising per capita income has been providing new opportunities and new avenues in Food and Beverages Sector and the conclave is aimed at highlighting the opportunities available in various segments of food processing industry

I congratulate the FTAPCCI team for organizing the event and wish the Conclave huge success.

Gowra Srinivas
President, FTAPCCI



MESSAGE

FTAPCCI is organizing Food Processing Industry Conclave 2018 (Conclave 2018) in Vijayawada to highlight the potential for developing the food processing industry in Andhra Pradesh. In addition, the food processing Policy of the Government of Andhra Pradesh, which is unique and highly encouraging to the entrepreneurs, can be showcased during the Conclave 2018.

In addition to the participation of the State Government representatives and industrialists, prominent institutions in the food processing sector are also participating. The Conclave 2018 will be a meeting ground where coalitions across sectors and institutions can be formed for the benefit of the entrepreneurs. The technology dissemination will help not only in establishment of suitable industries but also in reducing the large-scale waste of food material due to lack of adequate processing facilities. This will also result in remunerative prices to the farmers. Thus, the conclave aims at achieving multiple objectives.

There is need for massive investments in the food processing industry. We have tried to rope in some multi-national firms who have the funds and technology to make an impact on the food processing industry. Being first year, humble beginnings are made in this direction and we hope that the success of the conclave will attract more MNCs to Andhra Pradesh in future.

I wish all the best and success to the Conclave in achieving its objectives.

T.S.Apparao, IAS (Retd)
Secretary General, FTAPCCI



It gives me great pleasure to note that FTAPCCI is organizing “Food Processing Industry Conclave 2018” from 4th to 6th January at Vijayawada.

The food processing sector gained much prominence in recent years due to its high potential of employment generation and self employment opportunities. The total food production in India is estimated to be doubled in the next ten years thus offering opportunity for large investments in food processing / manufacturing, technologies, equipment and skills. The major interventions in this context are, for example, Canning, Dairy and Food Processing, Specialty Processing for adding additional nutrients, Packaging, Frozen Food / Refrigeration and Thermo Processing. Health food and health food supplements are other rapidly rising segments of this industry.

India is the largest producer of several agricultural commodities, and is ranked second in total food production, globally. The annual growth rate of the food processing sector is more than 7% and the online food delivery industry grew by 150% year on year in 2016-17. It implies that the food processing industry in India is on an assured growth trajectory. The government has opened the food processing sector for foreign investors by allowing 100% FDI into the sector.

Availability of raw materials, changing lifestyles and relaxation in policies has given a considerable push to the industry’s growth. Growth of food processing sector ensures remunerative prices to the produce of the farmers which in turn leads to development of agriculture sector. Thus the forward and backward linkages of the food industry have multiple advantages of – value addition to agri products, improved incomes to the farmers, access to quality products for the consumers and huge employment opportunities.

Andhra Pradesh is one of the largest contributors in food products with major contribution in agriculture, horticulture, dairy, poultry, fisheries and marine production. The AP Food Processing Policy 2015-20 offers various fiscal incentives to the entrepreneurs to manufacture at competitive cost. The State occupies number 1 Rank in Ease of Doing Business signifying that the units can be established at ease under Single Window Clearance.

FTAPCCI extends its earnest gratitude to the Andhra Pradesh Food Processing Society (APFPS), Government of AP for their support in making this programme a grand success.

I also express my sincere thanks to our Corporate Partners and without the due support from them the Conclave would not be the same.

Lastly, I also appreciate the efforts put in by our team from Secretariat Ms. Sujatha, Deputy Director, Mr. Girijapathi, Assistant Director along with Mr. Sampath, Mr. Vijay Kumar, Mr. Rajkumar, Marketing Executives and Mr. Baswant, Executive Officer, Mr. Srikanth, Ms Ankitha Sai, Ms. Radha Kumari Research Assistants in organizing the Conclave.

I wish the Conference cum Exhibition a great success

I not only wish the Conference a great success but also assume that FTAPCCI shall continue to organize such programs for larger public benefit.

K.Bhaskar Reddy

*Chairman,
Agriculture, Food Processing & Dairy Committee, FTAPCCI*



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Food Safety, Standards and Regulations



* Dr. V. Sudershan Rao

Food Safety is emerging as a major public health problem as an estimated 600 million fall ill after eating contaminated food and 420 000 die every year, resulting in the loss of 33 million healthy life years (DALYs). Consumption of unsafe food causes more than 200 diseases ranging from diarrhoea to cancers. Foodborne diseases impede socioeconomic development by straining health care systems, and harming national economies, tourism and trade. Food supply chains now cross multiple national borders.

Until recently, major food control legislation in India was Prevention of Food Adulteration Act and was essentially to control food adulteration and punish the offenders. However, these traditional systems cannot respond to existing and emerging challenges to food safety because they do not provide or stimulate a

preventive approach. During the past decade, there was a transition to risk analysis based on better scientific knowledge of foodborne illness and its causes. This provides a preventive basis for regulatory measures for food safety at both national and international levels. Simultaneously even the development of food standards are based on health consideration. Given this background, countries all over the world are updating their food regulations and developing the science based standards.

FOOD STANDARDS

The existing food standards drawn essentially from previous Act, have now been harmonised with international standards. As per these standards, two approaches are used i.e. Vertical Standards and Horizontal Standards. Vertical standards are essentially food product standards to ensure purity

and quality of the product, while horizontal standards address the food safety issues.

VERTICAL STANDARDS

These include quality standards of food products, e.g., fresh and processed fruits and vegetables, milk and milk products, meat and meat products, fish and fish products, poultry products, fats and oils, etc.

Horizontal Standards: Horizontal Standards are those, which apply across all products categories. For instance, food additives, food contaminants (like heavy metals, mycotoxins and other toxins), food hygiene (microbiological standards), pesticide residues, residues of veterinary drugs, food labelling, food inspection and certification, methods of sampling and analysis, and nutrition requirements.

FOOD SAFETY AND STANDARDS ACT 2006

This is a new integrated Food Safety Act promulgated on 23rd August of 2006. The Act is being implemented in a phased manner. This Act has replaced all the mandatory Food Safety Acts like Prevention of Food Adulteration Act, FPO, MMPO and MFPO. The Act is considered to be contemporary, comprehensive and intends to ensure consumer safety through Food Safety Management Systems and setting standards based on science and transparency. The Food Safety and Standards Act incorporates the salient features of Prevention of Food Adulteration Act, international legislations, and Codex Alimentarius Commission. The main features of the Act are: 1. Change of multilevel and multi-departmental control to integrated line of command, 2. Integrated approach to strategic issues like novel/ genetically modified foods and international trade, 3. Decentralization of licensing for manufacture of foods, 4. Shift from regulatory regime to self-compliance through Food Safety Management Systems, and 5. Graded penalties depending on the gravity of offences. It will also meet the dynamic requirements of Indian Food Trade and Industry and International Trade.

FOOD SAFETY AND STANDARDS REGULATIONS, 2011.

With powers vested under the act, The Food Safety and Standards Regulations, 2011 have been made and they came in to force from 5th August, 2011. They are regulations on 1. Licensing and Registration of food businesses, 2. Packaging and Labelling, 3. Food product standards and Food Additives, 4. Prohibition and Restriction on sales, 5. Contaminants, toxins and residues, 6. Laboratory and sampling analysis. As the name of the each of the regulations indicates that they deal with specific regulation. There have been many amendments to each of these regulations, since the implementation of the new act from

August, 2011. One of the important amendment in recent years has been the Gazette Notification of Food Safety and Standards (Food or Health Supplements, Nutraceuticals, Foods for Special Dietary Uses, Foods for Special Medical Purpose, Functional Foods and Novel Food) Regulations, 2016. This amendment intends to regulate all the Food or Health Supplements, Nutraceuticals, Foods for Special Dietary Uses, Foods for Special Medical Purpose, Functional Foods and Novel Food, which were outside the purview of the food regulations.

BUREAU OF INDIAN STANDARDS (BIS):

The Bureau of Indian Standards is a statutory body and its objective is for "Harmonious development of standardization, marking and quality certification". The Standards developed are quality standards and are voluntary in nature. However, some of these standards are made mandatory under Food Safety & Standards Act like packaged drinking water should be as per BIS.

AGMARK STANDARDS

Directorate of Marketing and Inspection Department attached to Agriculture Marketing Adviser, Government of India is empowered by The Agricultural Produce (Grading and Marking) Act, 1937 to fix quality standards, known as "AGMARK" standards and to prescribe terms and conditions for using the seal of 'AGMARK'.

So far, grade standards have been notified for 181 agricultural and allied commodities. The purity standards under the provision of the Food Safety and Standards Regulations, 2011 and Bureau of Indian Standards (BIS) Act, 1986 are invariably taken into consideration while framing the grade standards. International Standards framed by Codex/ International Standards Organization (ISO) are also

considered so that Indian produce can compete in the international markets. These standards are also voluntary.

FOOD LABELLING

The production, sale and consumption of pre-packaged foods have witnessed a major surge in the recent years in India. Food labelling is one of the important population-based approaches that can help consumers make healthy food choices by providing the necessary information about the food on the pack. The food label is one of the most important and direct means of communication of product information between buyers and sellers. Ideally, for consumers, food labels are tools to make informed and healthy choices.

MANDATORY LABELING

Each country makes its own labeling regulations and in India, Food Safety and Standards Regulations (2011) related to food labeling are provided in Packaging and labeling regulations. The mandatory food labeling that is required for the prepackaged foods to be sold in India should conform to these regulations. Mandatory food regulations include, Name of the food, List of the Ingredients, Net weight Name and complete address of manufacturer, Complete address of importer if imported Repacked imported



food : country of origin and complete address of importer and packing premises, Lot/Code /Batch identification, Date of Manufacturing, Use by date/expiry/Best before and Quantity ingredient declaration. In addition to the above basic food labeling requirements, the in the year 2009, declaration of nutritional information has been made mandatory. As per this regulation the label should provide



1. Nutritional information or nutritional facts per 100gr or 100ml or per serving and shall contain information on a) Energy in Kcal b) the amounts of protein, carbohydrate(specify quantity of sugar) and fat in gram c) the amount of any other nutrient for which a nutrition or health claim is made. If the claim made regarding the amount or type of fatty acid or the amount of cholesterol, the amount of saturated fatty acids, mono unsaturated fatty acids and poly unsaturated fatty acids in grams and cholesterol in milligrams shall be declared. In addition, trans fatty acid should also be declared.

CLAIMS

In recent times there has been lot of debate about the claims made by the food industry on the labels. In this context, it becomes necessary to understand the types of claims. As per the Indian food regulations there three different types of claims that can be made on food labels ie 1. Nutrition claim 2. Health Claim 3. Risk reduction claim

NUTRITION CLAIM

Nutrition claim means any representation which states, suggests or implies that a food has particular nutritional properties which is not limited to the energy value but include the protein, fat and carbohydrates, vitamins and minerals.

HEALTH CLAIMS

Health claim means any presentation that states, suggests or implies that a relationship exists between a food or a constituent of that food and health

and include nutrition claims which describes the physiological role of the nutrient in growth , development and normal functions of the body; other functional claims concerning specific beneficial effect of the consumption of food or its constituents, in the context of the total diet on normal function or biological activities of the body and such claims relate to a positive contribution to health or to the improvement of function or to modifying or preserving health.

RISK REDUCTION CLAIM

Risk reduction claim relates to the consumption of a food or food constituents, the context of the total diet to the reduced risk of developing a disease or health- related condition.

INTENT OF THE NEW FOOD REGULATIONS

The new act lays emphasis on science based standards, transparency in rule making and capacity building for self compliance by the industry. Under the new act every unit is expected to follow Good Manufacturing Practice and Good Hygiene Practices. The Food Safety Officers are expected to educate the food business operators before taking any punitive action.. If the act is fully implemented as planned, it will help both the consumer and food business operator. Safe and quality product for consumer and increased market reach for food business operator.

CONCLUSION:

Creating awareness on the objectives of the food safety and standards act and its various components among all the stake holders of food safety in India like industry, consumers and regulators would help in successful implementation of the act.

* Deputy Director(retd)
National Institute of Nutrition
Hyderabad

National Bank for Agriculture and Rural Development



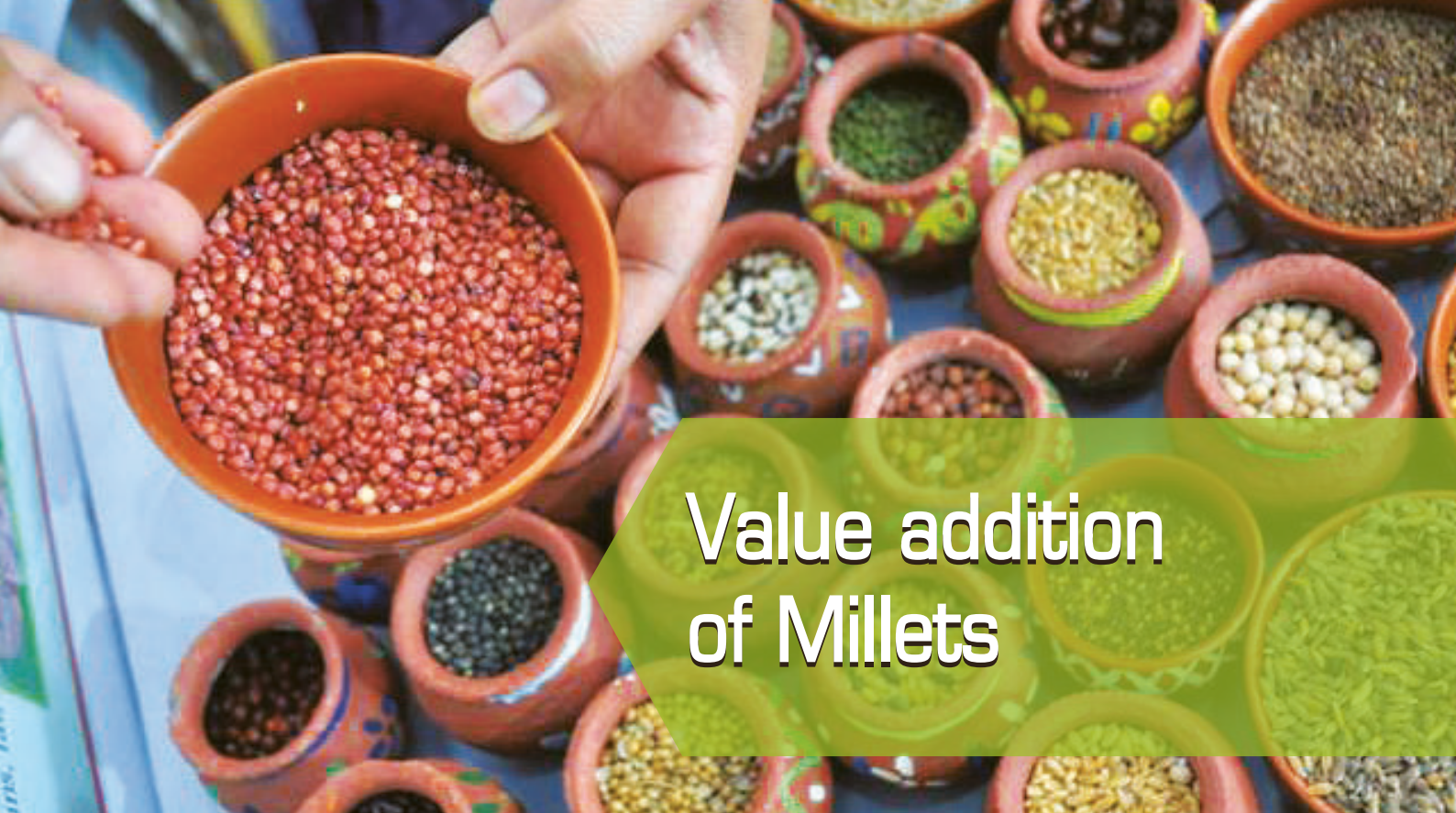
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Value addition of Millets

B. DayakarRao, E Kiranmai, VenkateshBhatand Vilas A Tonapi

Millet is a generic term used for small sized grains that form heterogeneous group and referred along with maize and sorghum as 'coarse cereals'. Millets are of minor importance in the west but a staple food in the diets of African and Asiatic people. Their agricultural importance arises from their hardiness, tolerance to extreme weather and could be grown with low inputs in low rainfall areas. Bajra or pearl millet (*Pennisetum americanum*), ragi or finger millet (*Eleusine coracana*), navane or foxtail millet (*Setaria italica*), samai or little millet (*Panicum miliare*), haraka or kodo millet (*Paspalum scrobiculatum*), panivaragu or proso millet (*Panicum miliaceum*), banti or barnyard millet (*Echinochloa frumentacea*) are the important millets cultivated largely in the Asian and African countries (Riley et al., 1993). Most of the millets are grown in different regions of the world from east to west. The world total production of millet grain was 762712 metric tonnes and India top ranking with a production of 334500 tonnes in 2010 (FAO, 2012). These crops have substantive potential in broadening the genetic diversity in the food basket and ensuring improved food and nutrition security (Mal et al., 2010). Along with nutrition millets offer health benefits in daily diet and help in the management of disorders like diabetes mellitus, obesity, hyperlipidemia, etc. (Veena, 2003). The nutritional importance of millets cannot be underestimated. Regular millet consumption reduces the incidence of cardiovascular, gastrointestinal and lifestyle (diabetes) diseases. To popularize the millet consumption, it is important to understand the nutritional health benefits of millets. However the data on the nutritional composition of millets is scanty.

Health benefits of millets

- ▶ **Gluten Free food recommended for celiac patients**
(Sorghum, pearl millet, finger millet, foxtail, proso, kodo, barnyard & little millet)
- ▶ **Increases insulin sensitivity, good for diabetic**
(sorghum, pearl millet, foxtail, kodo, & barnyard millet)
- ▶ **Acts as Anti-cancer agent**
(finger millet, pearl millet, kodo, barnyard & proso)
- ▶ **Controls Obesity**
(finger millet, kodo, barnyard, little millet)
- ▶ **Reduces the risk of CVD**
(sorghum, finger millet, foxtail, proso millet)
- ▶ **Controls hypertension**
(sorghum, finger millet, foxtail, proso millet)

Millets are neither ready to eat nor ready to cook grains and need some kind of processing invariably for human consumption. Most commonly followed conventional processing methodologies are milling including decortication and size gradation, popping, malting, and fermentation. In the recent years the contemporary food processing technologies such as extrusion cooking, cold extrusion (vermicelli/ pasta/noodles), baking, flaking and, puffing are applied for millets to increase the demand and utility of millets.

Most traditional processing techniques are laborious, monotonous and manual. They are almost entirely left for women to do. To some extent, the methods that are used have been developed to make traditional foods to suit local tastes and are appropriate for these purposes. Traditional techniques that are commonly used include decortication (usually by pounding followed by winnowing or sometimes sifting), malting, fermentation, roasting, flaking and pounding. These methods are mostly labor intensive and give a poor-quality product.

Indian Institute of Millets Research (IIMR) has pioneered in diversification of processing technologies in millet in order to provide wide options to consumers, otherwise prior to IIMR initiative due to absence of the convenient technologies in millets led to decline in their consumption. Developed millets value added Ready to Cook/Ready to Eat products, now value added technologies are made available for wider consumption to meet the consumer requirements (healthy and tasty).

Processing Technologies of Millets:

PRIMARY PROCESSING

Primary processing of the grain is the removal of impurities, foreign contaminants and glumes from the

grain that are necessary to improve the storage capacity of the grain and consumer acceptability for usage. Dehulling of the millets is an important process to separate millet rice from whole grain for further process like cooking or product development.

SECONDARY PROCESSING

Primary processed raw material in to product which is suitable for food uses or consumption such as Ready-To-Eat (RTE) and Ready-To-Cook (RTC) products, which minimizes the cooking time and make it convenience foods. IIMR has developed, standardized millet based products such as atta, semolina (fine & medium), flakes, biscuits and cold extruded products (pasta & vermicelli) by using different processing technologies.

MILLING

Millets flour is made through milling technology. Milling is a process of separating the bran and germ from the starchy endosperm so that the endosperm can be ground in to flour and rawa using different types of sieves in a hammer mill. The quality of the product was evaluated by preparing roti or other products. For example, millet semolina locally called as rawa or suji can be made in two forms with two different particle sizes, coarse 1.18 mm and fine 0.71 mm respectively. Both forms of rawa are commercially available in market. Rawa recovery ranges from 50-85% in case of coarse rawa and 40-75% in fine rawa and remaining 60-70% is flour. The recovery however depends on the millet variety as well as the machinery used.

Foxtail rawa



Kodo Millet Flakes



FLAKING

The method of preparing flakes from millets is not different from rice. Flakes can be made easily by roasting and flaking by flaking machines.

COLD EXTRUSION

Cold extruded products such as vermicelli and pasta generally made from durum wheat or refined wheat flour. These products also can be prepared with millets with the same machine. Millet suji is used to make vermicelli and pasta by using suitable dies. Mixed material extruded through dies and dried till the required moisture is reached.

Ragi vermicelli



Pasta Foxtail



Millet puffs



PUFFING (EXPANDED GRAINS)

expanded rice or murrumura is a very popular product. But similar products from other cereals are rare. The reason being preparation of such products need elaborate processing of cereals viz. parboiling and pearling of the grain before subjecting to HTST treatment. Expanded grains of millets are possible by using same method.

HOT EXTRUSION

extrusion cooking and roller drying are highly popular and are largely followed for corn and rice. Millets can also be extrusion cooked to prepare ready to eat products successfully. The products will have crunchy texture and can be coated with traditional spice and condiments. These products being ready to eat nature will have greater scope for use as weaning and supplementary foods.

BAKING

Biscuits are popular ready to eat products liked by children to old age

Salt Cookies



group in a family. Bakers and home scale industries use the traditional method to preparing biscuits which completely done by hand. The procedure of making biscuits includes creaming (fat and sugar powder) and addition of the millet flour then mixing and making dough, rolling or sheeting, cutting in to biscuits and baking. The process is time consuming, tedious and labor intensive in making the biscuits in large scale. Cake, bun, bread, rusk, muffins, brownie and other bakery items also prepared with millets.

INSTANT MIXES

Ready to cook products made from millets instead of using rice and wheat. Millet based instant mixes such as upma, pongal, khichidi, payasam, bisibellibath, idli and dosa.

IIMR has developed 40 technologies of which 15 millet products are commercialized under the brand of "eatrite" solely to increase the consumption of millet in the country. Processing technologies were licensed by IIMR to 40 private companies some of them have established millet processing units in different states Telangana (8), Andhra Pradesh, Maharashtra (2), Tamil Nadu (2), Karnataka (1), and New Delhi (3) to manufacture and promote sorghum and millet value added products to reach millet products to consumers. Multi National Company M/s Britannia Industries Ltd. signed MoU with IIMR to work jointly on R&D of millet bakery products (biscuits) to include millets in nutri-choice.

Value addition to the millets impact on different aspects primarily it creates demand and usage of millets in the consumer's daily diet in present lifestyle. Millets have good health benefits to prevent diabetes, cardiovascular disease, blood pressure, cancer etc. entrepreneurs come forward to start the millet processing units for this they required raw material so ultimately its impact on farmers to cultivate millets

to meet the demand for processing and consumption of millets. On technological intervention has been successful in creating options for consumers in millets. This has led to impact both consumers whoever suffering from life style diseases as healthy choice but also to enhance the farmer's income.

Upma Mix



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Role of Fortified Foods in India Opportunities and Way Forward

* Madhavi Trivedi

abstract

Malnutrition is one of the largest development challenges facing the world. Micro-nutrient malnutrition (hidden hunger) is rampant in India. Nutritional surveys in India have shown an inadequate intake of some micronutrients. The nutritional status of the population is one of the important factors determining the quality and productivity of the population, which in turn affects national productivity. In the long term, good nutritional status contributes to the intelligence and health of the population. Consequently, programmes directed at improving the nutritional status of the population will undoubtedly be a high priority in the national development scheme of any country, developed or developing.

Food fortification, i.e., the addition of nutrients to specific foods based on the dietary habits and

nutritional status of the target population, is one of the most popular nutritional interventions for improving the population's nutritional status. Food fortification can deliver essential micronutrients to large population segments without modifications in consumption pattern, suggesting that fortified foods may be formulated for populations at risk.

Fortification of staple foods to prevent micronutrient deficiencies is effective, easy, fast, safe, and relatively inexpensive. Fortification can be used to correct or prevent widespread nutrient intake shortfalls and associated deficiencies, to balance the total nutrient profile of a diet, to restore nutrients lost in processing, or to appeal to consumers looking to supplement their diet. Food fortification could be considered as a public health strategy to enhance nutrient intakes of a population.

* Associate Director -
Nutrition and Scientific Affairs Kellogg India Private Limited



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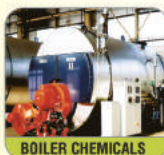


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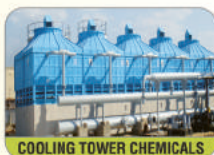


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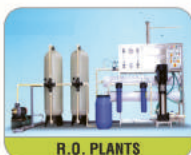
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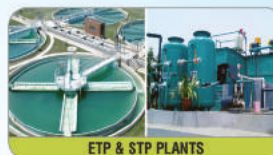
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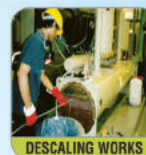
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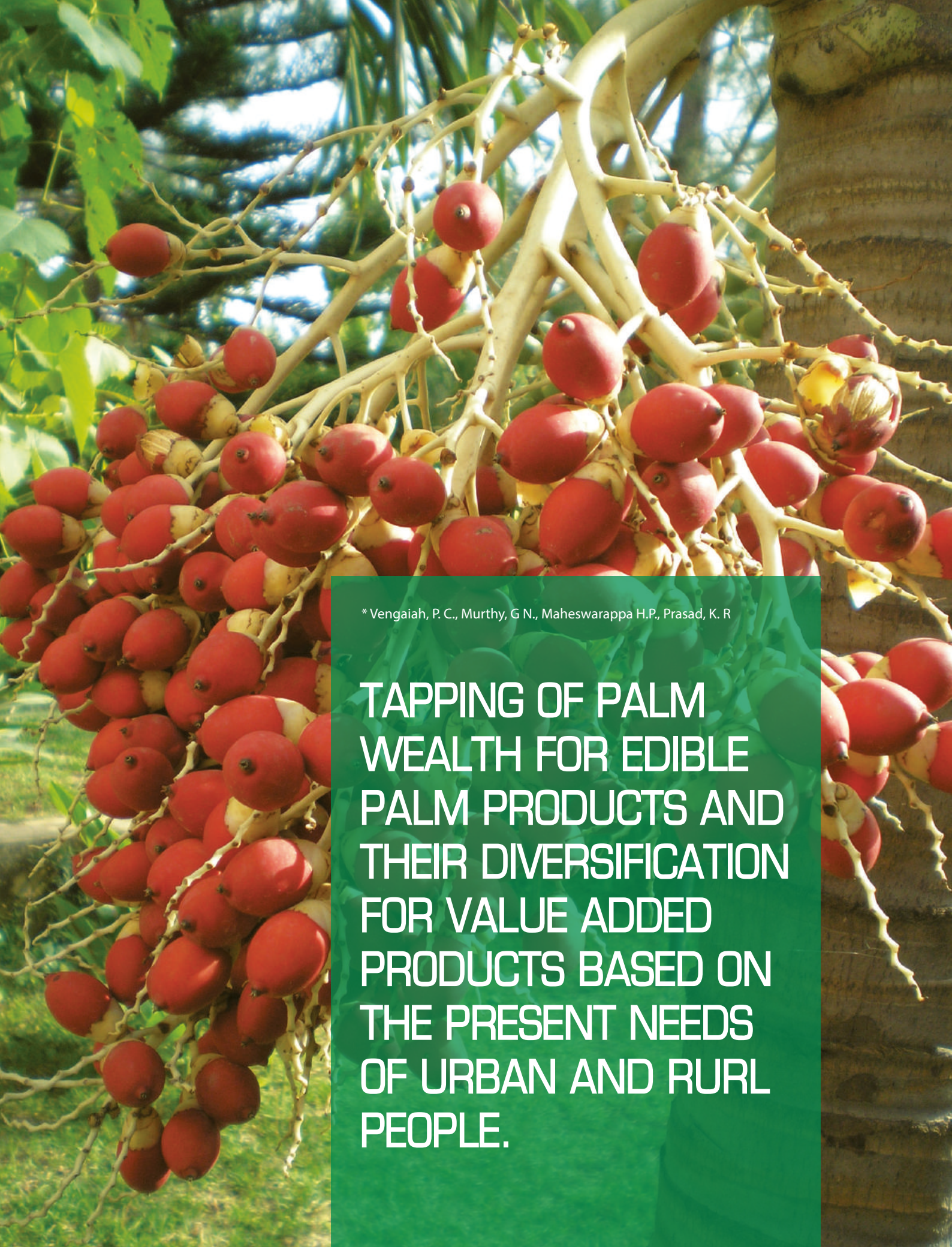
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TAPPING OF PALM WEALTH FOR EDIBLE PALM PRODUCTS AND THEIR DIVERSIFICATION FOR VALUE ADDED PRODUCTS BASED ON THE PRESENT NEEDS OF URBAN AND RURL PEOPLE.

Palmyrah palm - *Borassus flabellifer*, the Asian variety - is a genus of six species of fan palms, native to tropical regions. It is an important multipurpose tree of great utility, grows extensively in North and Eastern part of Sri Lanka, southern part of India and in most of the tropical countries. The Palmyrah palm is described as the single most useful plant in the Northern region of Sri Lanka and engages human labour in the industries around it irrespective of gender or age. It is easily cultivated and also found to grow wild. Cultivation requires little labour in planting the nuts and protecting them from cattle till they grow above reach. The growth of the tree is very slow and it takes from 15 to 30 years to bear. The palmyrah palm is a large tree growing up to 30m high and the trunk may have a circumference of over 1.5 meters at the base. The trunk is black in colour and looks like cylinders. It is also corrugated by the semi circular scars of fallen leaves. The tree can be easily recognised by its gigantic fan shaped leaves. There may be 25-40 fresh leaves and they are leathery, gray green, fan-shaped, 1-3 meters wide and folded along the midrib and they spring at the top in a clump. They are usually very tough and have thick stalks. There are two kinds of the palmyrah - the male and the female. The male and female flowers are held by two different trees, never in one tree. Both male and female trees produce spikes of flowers but only the female plant bears fruits. However both trees are used to tap toddy. The flowers are small and appear in densely clustered spikes, developing into large, brown, roundish fruits. The male flowers are smaller than the female flowers. Palmyrah is a very important palm and playing an important role in the day-to-day life of poor and landless farmers. Palmyrah palm adorns the dry landscape of the semi arid tropics of Tamil Nadu, Andhra Pradesh, Orissa, West Bengal, Karnataka and Maharashtra. India nearly 102 million palms and about 30 percent of trees are in Andhra Pradesh. Due to its multifarious uses, the palm is equated to the "Kalpa Vriksha" in the mythology. Like the coconut, palmyrah is regarded as a total palm as each and every part of the palm right from fruit to root is having many fold economic uses. Though growing of this important palm has an immense potential, no determined effort has been made to bring the palm under cultivation. Palmyrah referred as tree of life with nearly 800 uses including food, beverage, fibre, fodder, medicinal and timber. Among the various edible uses of the palm, the sweet sap tapped from the inflorescence for making palm sugar is of prime importance. The endosperm of the young fruit, like tender coconut, is a delicacy in summer. The petiole fiber and leaf blade are used to make products such as brushes and

handicrafts. The tree serves as a source of raw material for several cottage industries.

Palmyrah has separate male and female trees. In general sex cannot be differentiated until flowering. But it was conformed that one can decide the sex by observing the leaf arrangement. For this so many field studies were conducted and finally it was concluded that the male palm which is having leaf arrangement in clockwise, if it is in anticlockwise that palm is female. For this further validation process is going on for final documentation.

The palm is a slow grower compared to the coconut, which is cultivated in areas with good irrigation. The stem of palmyrah is visible only after 4-5 years. In contrast, some dwarf cultivars of the coconut begin bearing at 4-5 years. Palmyrah needs minimum care, and if protected by fencing from stray cattle feeding on its foliage, the palm can come into flower and fruit within 10-12 years. Otherwise, it may take 20-25 years for the palm to flower.

The palmyrah stem is unbranched, usually growing to a height of 15-20 m, topped by 25-30 large fan-shaped leaves. However, there are dwarf palms that come into bearing even at a height of 4 m. The male palm produces 5-10 inflorescences each year. The male inflorescence is heavily branched with each branch having 2-3 spikes. Each spike has 800-1000 flower clusters, which in turn bear 15-20 little flowers. As a whole, a male inflorescence may have 200,000-250,000 florets. In contrast, the female inflorescence has only 2-3 branches, with each branch bearing 10-12 flowers. Normally a female palm produces 5-8 inflorescences with a total of 100-150 fruits. However, trees close to water sources may bear nearly 300-400 fruits. The fruits are generally black-skinned, but red skinned types also occur. These palmyrah-growing tracts receive one monsoon during October-November. Flowering is seasonal, and fruiting occurs in September-October. In nature, the fully-ripe, heavy fruits fall down and become buried in the soil. The rainfall received during the season facilitates germination. The fruits are normally 3-seeded and when all of them germinate from a single fruit, they give rise to three palms. Palmyrah is one of the major sources of palm sugar in Asian countries. The palm is planted on reservoir and lake banks to stabilize them. It is also planted on rice field margins to demarcate them. The palm does not need much water, requires very little maintenance and it is highly disease resistant. It stabilizes unproductive, erosion-prone soils. It can be planted in any type of soil to increase soil fertility and water conservation. It is used as a wind-break in sandy plains to stabilize dunes. Palmyrah is truly a multipurpose palm.

EDIBLE AND NON EDIBLE PRODUCTS FROM PALMS

Edible	Neera, Palm Jaggery, Palm Candy, Palm Sugar, Fruits Jam, Syrup, Chocolates, Toffees, Confectionery items are made by Palm Sugar)
Non-Edible	Palm Fibre Brush, Palm Leaf Fancy Articles, Naar Articles, Palm Leaf Visiting Cards.

2. EDIBLE PRODUCTS

NEERA AND NEERA BASED PRODUCTS

NEERA : Neera the delicious drink extracted from the sap of the palm is fast becoming popular in rural and urban areas of India. Refreshing as it is, the drink has agreeable flavor, high nutritive value and medicinal properties. It is whole some, cool and good for improvement of general health, especially as a supplement to those who have iron and vitamin deficiency. The popularity of system cool and improves appetite and digestion. It can be consumed in fairly large quantity without causing any to the system. As a good tonic to the asthmatic, anemic and leprosy patient, Neera has acted miraculously. It has also cured digestive troubles. It can also be used for preparation "GUR" syrup, rab, Palm Sugar, Palm Candy, and other Confectionery items, ice cream, various sweets. Sap tapped from palmyrah tree known as neera is transparent, pleasant smelling and sweet. It has medicinal value, as stimulant and anti plegmatic. It is also useful in inflammatory infections and dropsy. It forms a part of the daily diet of villages where it is grown. Neera is not only sweet and delicious, but als has nutrient and mineral, which prove to be a good supplement to diet in India.

TODDY: Toddy is formed as a result of fermentation of sugar sap by wild yeasts and bacteria, which come into contact with the sap. This is an uncontrolled natural fermentation by number of different strains of yeast and bacteria. The alcohol content

in fully fermented toddy is around 5 %. But fermentation of palmyrah sap using pure yeast cultures gives about 7.8% alcohol content under laboratory conditions. The major sugar present in partly fermented toddy are sucrose, glucose and fructose but these all are gradually converted to ethyl alcohol during fermentation.

PALMYRAH ARRACK : Arrack is manufactured from toddy by pot still distillation and patent still distillation. The approximate recovery of potable alcohol from toddy is 10%.

WINE : Sterilized unfermented sap could be fermented with suitable strains of yeast to produce palmyrah wine. Sweet toddy, with a ph of 6-7, sterilized and inoculated with good wine yeast produce a very clear straw coloured wine. The alcohol strength increases by adding extra sugar to the sap. The wine prepared in this manner is a pleasant drink without characteristic toddy flavour and sour taste of the acids present in toddy.

PALM JAGGERY : It is also called as palm gur. Jaggery is made by boiling neera in a galvanized iron pan at 110°C. Neera gets transformed in to viscous fluid which is poured in to shella and allowed to harden. About 8 liters of neera is required to get 1 kg of jaggery. Palm jaggery is almost like jaggery that is made out of sugar cane juice. It is highly priced due to its medicinal properties. It has an intense, earthy taste or reminiscent of chocolates in its taste. The palm jaggery obtained after processing is darker and richer in colour. It is slight salty to taste but much healthier of the two. Due to its cooling effects over human body, it is of high

value. It does not have the bone meal content which is used for whitening processed sugar. The price of the palm jaggery is double that of sugar. Neera converted into a solid or a semisolid crystalline mass ready for direct consumption is called Palm Jaggery. Jaggery is a solid mixture of reducing and non reducing sugars prepared by concentration of palmyrah sap, except fro small changes undergone during its manufacturing. It contains all constitutes of neera and is equally nutritious. The proximate composition of jaggery is moisture (8.97%), ash (3.25%), reducing sugar (3.41%), total sugars (73.87%). Protein (1.41%) and organic matter (11.1%). Palmyrah jaggery processing adequate amounts of Ca, low sodium and high potassium is prescribed for dispensing in conditions like hypertension and oedema due to heart and liver diseases. It is recommended for the treatment of diseases with marked loss of potassium as the case of diabetic acidosis, post operate convalescence and as a general diuretic. The iron content varies from 5 – 10 mg/100g palm gur. This can profitably be used to cure anemia. Jaggery contains very little amount of nitrogen. With regard to carbohydrates, it contain higher





amount of non reducing sugars than reducing sugars. The higher amounts of sucrose and glucose justify the recommended use of palm gur as good energy source for convalescents, since in the stage one requires readily available energy providing food. It contains vitamins like B12 and C3.

PALM SUGAR : With sucrose content 12%w/w and purity of about 80% the sap forms a suitable material for production of sugar. Palm sugar can be substituted to cane sugar in all preparations. It has high dietetic values and healing properties against disease of the eye. It also recommended for infants and people of old age. It contains Protein (0.24%), fat (0.37%), minerals(0.5%), carbohydrate (98.89%), calcium(0.08%), Phosphorus(0.06%), iron(30 mg/100g), nicotinic acid(4.02 mg/100g) and riboflavin(229 mg/100g) with calorific value of 398 K calories/100g.

PALM CANDY : Neera free from debris boiled in an alloy vessel adding small quantity of superphosphate. After uniform boiling the liquid is allowed to cool. After removal of sediments it is heated to 110°C for 2 hours until reaches honey like consistency. The fluid is then allowed to cool and poured in to crystallizer. Sugar crystals start forming after 45-60 days.

PALM HONEY : Neera is heated for 2

hours to obtain honey like consistency. The syrup then is transferred to mud pots. Ripe, dry and shelled tamarind fruits devoid of seeds are added in to syrup. About 1 Kg of fruit is required for adding to 10 liters of syrup. The pot is closed tightly with cloth and vessels are kept in a shock proof, cool and dry place for 130-180 days. Sugar chrysalises on the sutures of tamarind and the fruits become delicious.

PALM COLA: Palm cola is an aerated soft drink containing 11% sugar. Its other ingredients are cola concentrate, citric acid and food color. The palm sugar is treated with milk and its impurities are removed while boiling to temperature of 110°C-115°C. The boiling is stopped at 53Brix and the mixture is filtered through a filter press. Cola essence is added to mixture after cooling at the rate of 250ml/1000 bottles of palm cola. Bottles of 200 ml, previously sterilized are filled with the mixture at the rate of one fluid/bottle. This is carbonated with carbon dioxide and sterilized water. About 1kg of purified palm sugar is sufficient to produce 300 bottles of palm cola.

CONFECTIONARY : Presently made of its sugar is chocolates and ginger toffee. A mixture of glucose and palm sugar is boiled to a temperature of 120°C. The heated mixture is put into trays and mixed with powdered citric acid. A mixture of colour and essence is then added. The entire mixture is mixed well and cut into slabs, allowed to cool and packed.

harvested between 60-70 days to get soft nungu. To obtain tender nungu, fruits are harvested when the epicarp near the perianth region is light to yellowish green in colour. Fruits with black epicarp yield only hard and unpalatable nungu.

RIPNED FRUIT AND ITS PRODUCTS

FRUIT : Ripe palmyrah fruits give a sweet aroma and they drop off from the tree when fully ripe. The mesocarp is fleshy and fibrous. The fruit is roasted in fire and consumed. Several value added products can be prepared from the fleshy mesocarp after removing the fibre.

TUBER AND ITS PRODUCTS

TUBER (APOCOLON): The mature tuber is brittle and it breaks off easily and is less fibrous compared to immature ones which are flexible. The tuber is a rich source of starch. The optimum stage for harvesting tuber is 135 days after sowing and the weight of the tuber range from 90-110 g.

THAVAN (SPONGY HAUSTORIUM): Thavan formed during germination of seednut is spongy, sweet and is a delicacy. The weight of thavan decreases slowly beyond 90 days and it loses its palatability and consistency. The weight of thavan range from 25-30 g.

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- www.katpahachchola.com
- www.kvic-regppmegp.in
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TENDER FRUIT ENDOSPERM AND ITS PRODUCTS

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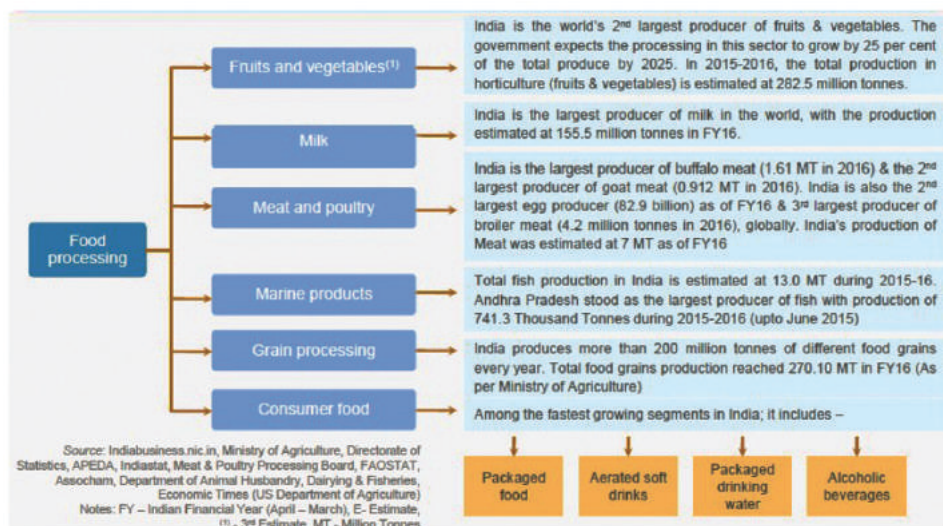
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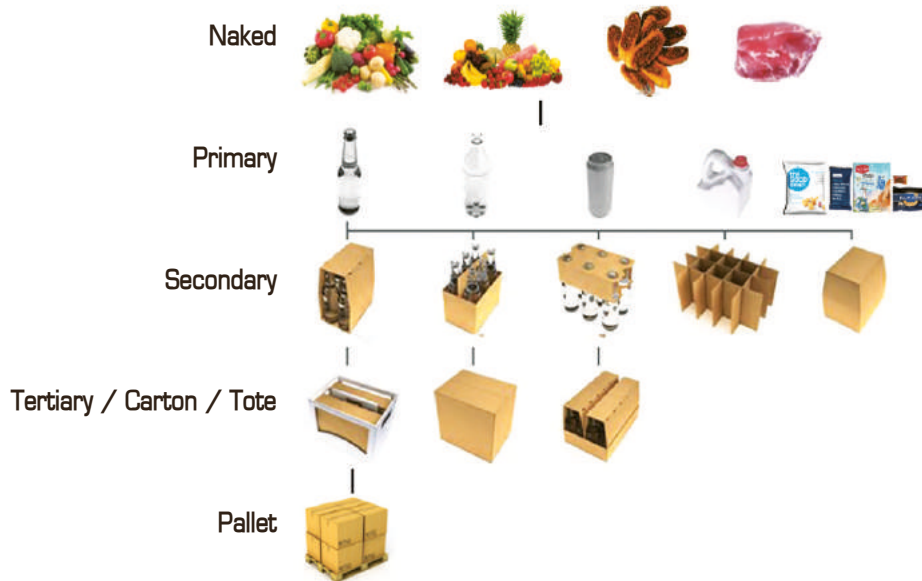
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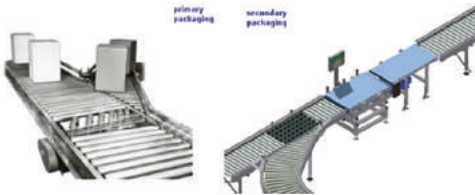
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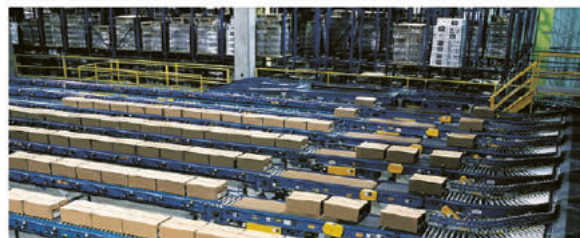


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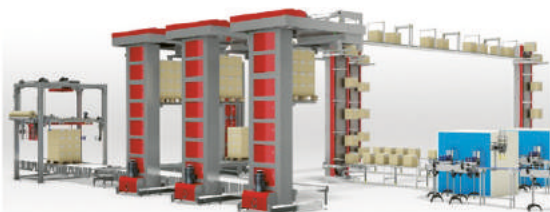
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SPICES their role in Food, Health, Pharmaceutical and Allied Industries – Value addition and Export Potentialities “Value addition to spices and Marketing”

* Prof. Surendra Kumar Sood

The term spice refers to aromatic or pungent, phenolic, vegetable substances used to flavour foods, pharmaceutical and many other allied industries used since ancient times.

Spices not only flavour the product but many of them are very good source of natural colours like turmeric, chillies etc. Spice conjures up in our mind thousands of culinary delicacies. These perform the dual role of flavour amelioration and excitement of taste buds which have beneficial role on appetite, stimulation of gastro intestinal function by increased salivation and gastro flow.

There are more than 60 spices commonly used in our day to day life for various purposes.

Botanically, spices can be classified in seven groups

Fruits : Black pepper, white pepper, chillies, nutmegs, paprika, vanilla etc.

Flowers : Cloves, saffron etc.

Seeds : Anise, fennel, coriander, fenugreek, caraway, dill, poppy, sesame, cardamom, cumin, mustard. Etc.

Barks : Cassia, Cinnamon etc.

Roots : Ginger, Turmeric etc.

Herbs : Mint, Coriander, Bay, Parsley etc.

Aromatic Vegetables. : Onions, garlic etc

Spices can also be classified on their properties

Stimulating : Pepper, mustard, horse radish, garlic

Aromatic : Anise, Cardamom, cloves, Ginger

Spice colours:

Most of the advanced countries have banned the artificial colours in food products, there is very good demand for natural colours globally Curcumin, which is yellow colouring matter of turmeric and the red colour of chillies free from pungency are in great demand. Similarly Bixin – Annatto colour, merrygold colour, blue grapes, beetroot colours can be extracted in the same plant which have wide application in dairy, fat compositions in many food products.

Applications:

Spice oils and oleoresins have advantage over natural spice. They provide standardization consistency, hygiene and there is big potential in their use in new product development. This is equally applicable to food products, pharmaceuticals, liquor, cosmetics, and many other allied industries

Role of Spices in Allied Industries

Processed Meats: The use of spices, particularly pepper in the

manufacture of meat products is very important. Typical seasoning mix for fresh sausages which consist of pepper, capsicum, ginger, nutmeg plus herbs. For dry sausages and pickled meats cardamom and coriander are must ingredients.

Fish and vegetables: Particularly pickled and brined products such as herrings, contains a wide range of spices and herbs. The use of oleoresins will provide easier preparation, reduce handling costs and uniformity in the product.

Cheeses and Dairy products: will have significance in processed cheeses and savoury spreads.

Soups, sauces, chutneys and dressings

Oleoresins of celery, pepper, capsicum are used in combination with the oils of onions and garlic. Coriander and ginger extracts are used in barbeque sauces, etc. broaden the new products and opportunities.

Baked Goods: The use of spice extracts in cake fillings, biscuits, snacks are increasing very fast

Baking industry generally uses ginger, cardamom, cinnamon, and nutmeg besides many other spices.

Confectionery: Cardamom oil, and other extracts in toffees, chocolates and others, provides a very novel and pleasing confectionery ingredient new to the market.

Snacks: Oleoresins of pepper, chilli, celery are very

commonly used in almost all the snacks. Turmeric and chilli extract are used to have colour besides the taste

Alcoholic Beverages: Ginger oil is used in the preparation of ginger beer, ginger ale etc. is well known all over the world

Cosmetics: The use of spice oils in the preparation of creams, soaps, shampoos, lacquer, lipsticks etc. is well known. More and more people are opting for herbal products.

Perfumes: The use of essential oils and oleoresins is well established fact and is being used increasing all over the world.

Hygiene products: Products like tooth pastes, mouth washes, mouth fresheners are using the oleoresins since a very long time.

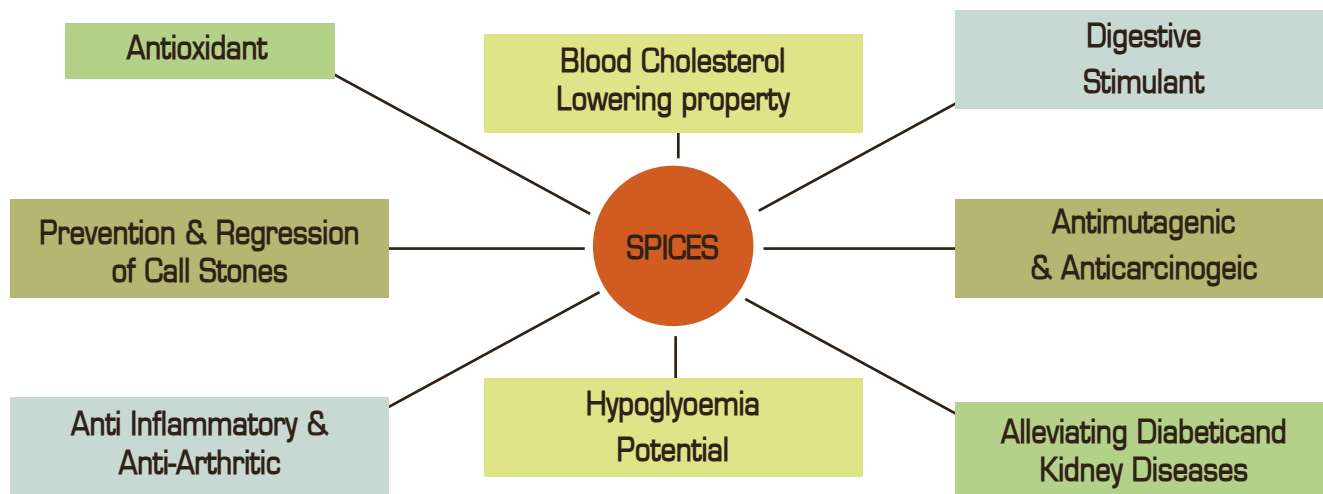
Detergents, soaps, cleaning materials etc. are associated with base products.

Aerosols: Air fresheners, polishes, lacquers, cleaning agents as well as waxes etc. use perfumed and essential oils to provide their pleasant and fresh aroma.

Pharmaceuticals: Both oils and oleoresins are widely used in pharmaceuticals products to provide pleasant taste aroma to the medicinal products, which otherwise be difficult to accept.

Eg: skin creams, cold remedies.

Hypoglycemia Potential



CHILLIES (*Capsicum annum L*)

A common ingredient and a must in every kitchen red chillies taken in low doses can help relieve pain, inflammation and hyper reactive disorders besides protecting cell membrane from pollution induced damage.

Capsaicin, the main pungent material present is distributed throughout the chilli in varying concentration. The ribs contains 80 per cent capsaicin, seeds the next, the flesh and skin comes a close third.

If the choice is for more colour and less spice just ignore the seeds. As a general rule, the smaller the chilli, the hottor it is

Red chillies are hotter than greens.

Dried chillies are 10 times hotter than fresh ones.

Capsaicin is a lipophilic and dissolves easily in the lipid matrix present in the cell membrane. Low dose of capsaicin stabilizes the lipid matrix as well as calcium and neuropeptide.

Capsaicin also acts as antioxidant and protects against damage induced by free radicals.

Chilli is used in traditional medicines to treat inflammation, pain, hyperactive disorders. It is also being used to protect membranes against various pollution induced damages.

Some of the value added products from chillies are:

Whole chillies, Ground chilli powder, Essential oil, Oleoresins, Encapsulated products, Instant ready mixes, Traditional Indian foods, Culinary preparations, Natural colour extraction and Pastes, pickles.

TURMERIC (*Curcuma longa* L)

Turmeric a common ingredient in every house. Besides colour, appearance it has many health benefits and serious diseases preventing qualities.

Studies carried out at National Institute of Nutrition, Hyderabad has proved that Turmeric can prevent cancer, skin disorder, itching has excellent antiseptic property, and helps in fast healing of wounds. It can also reduce the fat accumulated in the body.

It is also useful in treating jaundice, arthritis, cold etc.; the latest research has revealed that Turmeric is useful in treating Alzheimer disease as it contains a natural agent that blocks the formation of beta-myeloid, responsible for the plaques that slowly obstruct cerebral function.

Products of commercial importance:

Turmeric powder, Turmeric essential oil, Turmeric oleoresin, Culinary preparation, Various pastes, Instant foods (Mixes), Curry powders, Encapsulated form, Curcumin colour, Encapsulated form

Hence Turmeric is also known as "Yellow Gold"

CORIANDER (*Coriandrum sativum* L)

THERAPEUTIC PROPERTIES OF CORIANDER SEEDS

India is a major producer of coriander. It has a pleasant flavor and every part of plant is edible. The seeds have health promoting qualities and are used in food and pharmaceutical industries. It is an established fact of curing indigestion, anxiety, against worms rheumatism, joint pain etc.

Coriander seed have lemony citrus flavour when crushed due to terpenes linalool and pinene. Highly effective in preventing Diarrhoea, swellings, mouth ulcers, Anemia and Kidney problems, Menstrual bleeding etc.

Value Added Products:

Dhania powder, Dhania Dal, Instant Ready Mix Masala, Curry Powders, Oleoresins, Essential Oils

FENUGREEK (*Menthi*) (*Trigonella foenum graecum* L) Diabetic control:

Fenugreek (*Trigonella foenum – graecum*) seeds are rich in carbohydrates especially mucilaginous fibre. This soluble fibre is comprised of galactomannans, similar to guar gum. Fenugreek also contains rich variety of saponins and flavonoids. All these substances are known to reduce blood lipid levels.

Adding Fenugreek to the diet reduces fasting blood sugar and improves after meal glucose tolerance significantly.



GINGER (*Zingiber officinale*)

* Ginger is a perennial herb with underground branching system (Rhizomes). The leaves and rhizomes of ginger have a characteristic fragrance. Ginger has been used as a medicine in India from Vedic period and called "Maha aushadhi".

Ginger products:

Dried ginger, Ginger powder, Ginger paste single and in combination with other condiments,

Ginger preserve (Murabba), Ginger oil - Oleoresins, Ginger in alcoholic beverages (Liqueurs), Non-vegetarian food products, mouth fresheners, Pharmaceutical products and many allied industries.

PEPPER (*Piper nigrum* L)

Pepper is a flowering vine, cultivated for its fruits which are used as spice and for seasoning. The fruits are known as pepper corn and powdered pepper derived after grinding them. The spiciness of the black pepper is due to chemical PIPERINE which has no relevance to capsaicin present in chillies. There are various types of peppers such as Black, White, Green, Red or Orange pepper etc.

Black Pepper: The matured drupes are cooked in hot water and then dried. The heat ruptures cell walls, speeding the



browning enzyme during drying, resulting in darkening, wrinkled black layer. Once dried it is called pepper corn. Black pepper is more spicier than white pepper.

White pepper: It consists of the seeds of the pepper plant along with the outer dark coating removed. This is achieved by soaking the corn in water for few days during which the flesh of the corn softens and decomposes. Rubbing removes the outer layer and seed is dried. There are improved methods for decortications. The removal can be either by mechanical, chemical or biological methods.

Green pepper: It is from the unripe drupes. Dried green pepper corns are treated in a way that retains green colour and dried. Unripe drupes are preserved in brine or in vinegar.

Red Pepper or Orange Pepper: Red pepper are dried using colour preserving techniques as adopted in green pepper. The pink pepper corns are from a different family, the Peruvian pepper tree, *Schinus molle*, a Brazilian pepper tree.

Flavour loses: are due to exposure to atmosphere and light. Ground pepper loses more flavour than pepper corns. Preserving in air tight, moisture barrier, light barrier, oxygen barrier films are essential to prolong the keeping quality of the spice.

Encapsulation Technology

The science of capturing a core material in a shell or coating for controlled release can provide the food industry a distinct advantage. Microencapsulated products can add extra Zing, Mask the taste of nutrients, alleviate processing problems and increase the shelf life of the food products.

Why Encapsulate ? Flavour, taste and an appetizing appearance are primary factors in a consumer's decision

to buy a product. Volatile colourants and aromas can be stabilized and their processing made simpler through microencapsulation.

Microencapsulation technology provides viable texture blending, appealing aroma release and taste and colour masking. The technology enables food companies to incorporate minerals, vitamins, essential oils, creating food for the market.

Microencapsulation can prove the convenience of food, simplify the food manufacturing process by converting liquids to solids, decrease production costs etc.

Material used for Encapsulation shell

- * Polysaccharide / hydrocolloids
- * Proteins such as gelatin, casein, soya, albumin,
- * Fats and fatty acids eg. Mono, di, triglycerides, stearic acid and their salts.
- * Cellulosic derivatives
- * Hydrophilic and lipophilic waxes, polyethylene glycol, beeswax etc.
- * Sugar derivatives

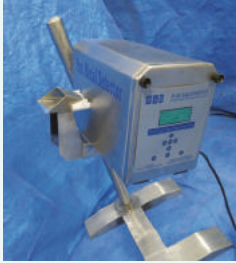
Microencapsulation will play a key role without sacrificing flavour, taste, appearance and convenience. This technology has a great future.

*Scientist -Technologist



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Delecto Foods Pvt. Ltd was incorporated in 2012 . The company is engaged in manufacture of Instant Chicory, packaging and exporting of instant coffee such as agglomerated Coffee , spray dried and Freeze dried coffee to many countries across the globe.

The company's modern Instant chicory plant is located in Gajwel, 40 km from Hyderabad with an installed capacity of 2400 MT per annum .

The company is a 100% Export oriented unit with its corporate office at 202, Oxford Plaza, S.D. Road, Secunderabad,

The company has also a marketing office in it's major market, Russia located in Moscow.

Some of the company's popular brands packed out of this facility are Café pus and Neo Cafe

Based on the current demand the company is in the midst of upgradation plans to meet current and future needs of the business.

DELECTO FOODS PVT LTD (100% Export Oriented Unit) 202, Oxford Plaza, No.9-1-129/1, S.D.Road, Secunderabad -500003, Telangana , INDIA Ph: (040) -40266650/ Telefax: (040) 27700805, E-mail: mdo@delectofoods.in , website: www.delectofoods.in



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AGRO PROCESSING



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IB STAR AGRO MILLS		AGRO PROCESSING LOANS
Purpose	All new / existing Rice Mills, Dhal Mills, Oil Mills & Flour Mills.	All Micro, Small & Medium Enterprise (both manufacturing and Service) in Agro Processing Sector
Eligibility	Collateral coverage calculation	Collateral coverage calculation
Type of Facility	Term Loan / OCC / OD	Term Loan / OCC / OD
Quantum of finance	Need Based Credit	Minimum Exposure: Above Rs 10.00 lac Maximum Exposure: No ceiling
Margin	Term Loan Machinery - 25% Land & Building - 30%	Working capital – OD / OCC 25%
Security	As permissible	
Rate of Interest	@ 8.90 %**	@ 9.5% to 10.35%**

*Terms & Conditions Apply

**Based on rating framework

Annexure - I

Pradhan Mantri Kisan SAMPADA Yojana

Government of India (GOI) has approved a new Central Sector Scheme – Pradhan Mantri Kisan SAMPADA Yojana (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters) with an allocation of Rs. 6,000 crore for the period 2016-20 coterminous with the 14th Finance Commission cycle. The scheme will be implemented by Ministry of Food Processing Industries (MoFPI)

PM Kisan SAMPADA Yojana is a comprehensive package which will result in creation of modern infrastructure with efficient supply chain management from farm gate to retail outlet. It will not only provide a big boost to the growth of food processing sector in the country but also help in providing better process to farmers and is a big step towards doubling of farmers income, creating huge employment opportunities especially in the rural areas, reducing wastage of agricultural produce, increasing the processing level and enhancing the export of the processed foods.

The following schemes will be implemented under PM Kisan SAMPADA Yojana:

- * Mega Food Parks
- * Integrated Cold Chain and Value Addition Infrastructure
- * Creation / Expansion of Food Processing & Preservation Capacities
- * Infrastructure for Agro-processing Clusters
- * Creation of Backward and Forward Linkages
- * Food Safety and Quality Assurance Infrastructure
- * Human Resources and Institutions

Mega Food Parks

The Scheme of Mega Food Park aims at providing a mechanism to link agricultural production to the market by bringing together farmers, processors and retailers so as to ensure maximizing value addition, minimizing wastage, increasing farmers' income and creating employment opportunities particularly in rural sector. The Mega Food Park Scheme is based on "Cluster" approach.

The Mega Food Park project is implemented by a Special Purpose Vehicle (SPV).

So far Nine Mega Food Parks, namely, Patanjali Food and Herbal Park, Haridwar, Srini Food Park, Chittoor, North East Mega Food Park, Nalbari, International Mega Food Park, Fazilka, Integrated Food Park, Tumkur, Jharkhand Mega Food Park, Ranchi, Indus Mega Food Park, Khargoan, Jangipur Bengal Mega Food Park, Murshidabad and MITS Mega Food Park Pvt Ltd, Rayagada are functional.

Pattern of Assistance

- * The scheme envisages a onetime capital grant of 50% of the project cost (excluding land cost) subject to a maximum of Rs. 50 crore in general areas and 75% of the project cost (excluding land cost) subject to a ceiling of Rs. 50 crore in difficult and hilly areas.

- * A Program Management Agency (PMA) is appointed by the Ministry to provide management, capacity building, coordination and monitoring support. For meeting the cost of the above and also other promotional activities by the Ministry, a separate amount, to the extent of 5% of the overall grants available, is earmarked.

Cold Chain

The objective of the Scheme of Cold Chain, Value Addition and Preservation Infrastructure is to provide integrated cold chain and preservation infrastructure facilities, without any break, from the farm gate to the consumer. It covers pre-cooling facilities at production sites, reefer vans, mobile cooling units as well as value addition centres which include infrastructural facilities like Processing/ Multi-line Processing/ Collection Centres, etc. for horticulture, organic produce, marine, dairy, meat and poultry etc.

Pattern of Assistance

Financial assistance (grant-in-aid) under the scheme is limited to a maximum of Rs 10 crore per project in relation to technical civil works and eligible plant & machinery.

Pattern of Release of Grant

The grant-in-aid under the scheme is released in three instalments of 25%, 40% and 35% as per following schedule:

- * 1st installment of 25% of the total grant under the scheme is released after ensuring that 25% of the promoter's contribution and 25% of the term loan has been spent on the project;
- * 2nd installment of another 40% of the total grant is released after ensuring that utilization of first installment of grant, 65% of promoter's contribution & 65% of term loan;
- * 3rd and final installment of remaining 35% of the grant assistance is released after ensuring utilization of the

second installment and 100% of promoter's contribution and 100% of term loan.

Scheme for Creation/Expansion of Food Processing/ Preservation Capacities

The main objective of the Scheme is creation of processing and preservation capacities and modernisation/ expansion of existing food processing units with a view to increasing the level of processing, value addition leading to reduction of wastage. The setting up of new units and modernization/ expansion of existing units is covered under the scheme.

Pattern of Assistance

- * 35% of the eligible project cost subject to a maximum of Rs. 5.00 crore in General Areas;
- * 50% of the eligible project cost subject to a maximum of Rs. 5.00 crore in North Eastern States including Sikkim and Difficult areas including Himalayan States, State Notified ITDP areas and Islands.

Pattern of Release of Grant

Grant is released in two instalments each @50% of grant in the following manner:

- * The first installment of grant is released after the firm has utilized 50% of the term loan as well as 50% of promoter's contribution and on production of the required documents.
- * The second instalment is released on the commencement of commercial and submission of documents regarding utilization of 1st instalment of grant and 100% of Term Loan as well as 100% of Promoter's contribution.

Agro Processing Cluster

The scheme aims at development of modern infrastructure and common facilities to encourage group of entrepreneurs to set up food processing units based on cluster approach. Under the scheme, effective backward and forward linkages are created by linking groups of producers/ farmers to the processors and markets through well-equipped supply chain consisting of modern infrastructure for food processing closer to production areas and provision of integrated/ complete preservation infrastructure facilities from the farm gate to the consumer.

Pattern of Assistance

- * For the Government Organizations, grant to the tune of 100% of equipment cost plus cost of consumables and expenditure related to JRF/SRF/RA, specific to the project of specified duration for maximum three years. No assistance is provided for already existing equipments.
- * For Private Organizations, grant to the tune of 50% of

equipment cost in general areas and 70% in the difficult areas.

- * Funds are also be provided towards TA for attending EC meeting (one time) & subsequently for project review presentation (one time) to the Principle Investigator only in case of approved projects.

Pattern of Release of Grant

- * First installment of 35% of the total approved grant is released to the PEA after incurring an expenditure of 35% of the bank term loan and 35% promoters contribution/ equity;
- * Second installment of 40% of the total approved grant is released after incurring an expenditure of 75% of the bank term loan and 75% of promoters' contribution / equity;
- * Third & final installment of 25% of the approved is on completion of the project and submission of requisite documents

Scheme for Creation of Backward and Forward Linkages

The objective of the scheme is to provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain in terms of availability of raw material and linkages with the market. Under the scheme, financial assistance is provided for setting up of primary processing centers/ collection centers at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport.

Pattern of Assistance

The maximum grant extended per project is Rs 5.00 crore @ 35% of the eligible project cost for general areas and @ 50% for North East States, Himalayan States, ITDP Areas and Islands respectively, subject to maximum of Rs. 5.00 crore per project. The grant is provided only in respect of technical civil work and eligible plant & machinery.

Pattern of Release of Grant

The grant-in-aid under the scheme is released in three installments of 25%, 40% and 35% as per following schedule:

- * The first installment of 25% of the approved grant is released after ensuring that 25% of the promoter's contribution and 25% of the term loan is spent on the eligible project cost;
- * The second installment of 40% of grant is released after ensuring utilization of first installment of grant released, 65% of promoter's contribution and 65% of term loan;
- * The third and final installment of remaining 35% of

the approved grant under the scheme is released after ensuring utilization of the second installment, 100% of promoter's contribution and 100% of term loan.

Food Safety & Quality Assurance Infrastructure

Quality and Food Safety have become competitive edge in the global market for food products. For the all-round development of the food processing sector in the country, various aspect of Total Quality Management (TQM) such as quality control, quality system and quality assurance should operate in a horizontal fashion. Apart from this, in the interest of consumer safety and public health, there is a need to ensure that the quality food products manufactured and sold in the market meet the stringent parameters prescribed by the food safety regulator. Keeping in view the aforesaid objectives, government has been extending financial assistance under the scheme under the following components:

- i) Setting Up/Up-gradation of Quality Control/Food Testing Laboratories
- II. HACCP/ ISO Standards/Food Safety/Quality Management Systems

I. Setting Up/Up-gradation of Quality Control/Food Testing Laboratories

In the interest of consumer safety and public health, there is a need for testing food products in order to ensure that it complies with domestic standards as well as international standards for exports. A network of food testing and analysis laboratories is required to support the surveillance system of food regulator, timely analysis of samples and ensure compliance of international and domestic standards on food in case of exports as well as imports. Under the scheme, Central/ State Government and their organizations/ Government universities (including deemed universities) and all other implementing agencies/private sector organizations/ universities (including deemed universities) are eligible to receive financial assistance for setting up of food testing laboratories.

Pattern of Assistance

* Central/State Government and its organizations / universities (including Govt. owned deemed universities) are eligible for grant-in-aid of entire cost of laboratory equipment and 25% of the cost of technical civil work to house the equipment and furniture and fixtures associated with the equipment for general areas and 33% for difficult areas. In addition, they are also eligible for 80% of the monthly emoluments of two technical staff for two years from the date of completion of the laboratory.

* All other implementing agencies/private sector organizations/ universities including deemed universities will be eligible for grant-in-aid of 50% of cost of laboratory

equipment and 25% of the cost of technical civil work to house the Equipment and furniture and fixtures associated with the equipment for general areas and 70% of cost of lab equipment and 33% of technical civil work and furniture and fixtures for difficult areas.

Pattern of Release of Funds

(1) Central/State Government and its organizations / universities (including Govt. owned deemed universities)

* 1st installment of 40% of the total grant is released after receiving requisite documents prescribed under the scheme.

* 2nd installment of 40% of the total grant is released after ensuring full utilization of 1st installment of grant towards purchase of lab equipment, expenditure on Technical Civil Work (TCW) and fixing of Furniture & Fixtures for housing the equipment.

* 3rd installment of 20% of the total grant is released after ensuring full utilization of 2nd installment of grant towards purchase of lab equipment, completion of Technical Civil Works (TCW) and fixing of Furniture & Fixtures for housing the equipment. 4th and final installment comprising the emoluments at the rate of 80 percent for the two technical staff for 2 years is released after all the PAC approved equipment are purchased, installed and on submission of the utilization certificate for 3rd installment along with the status of NABL accreditation.

(2) All other implementing agencies/ private sector organizations/ universities including deemed universities

* 1st installment of 40% of the total grant is released after ensuring that 40% of the promoter's contribution and 40% of the term loan has been spent on the project.

* 2nd installment of another 40% of the total grant is released after ensuring utilization of first installment of grant and utilization of 80% of promoter's contribution and 80% of term loan.

* 3rd and final installment of remaining 20% of the is released after ensuring utilization of the second installment and utilization of 100% of promoter's contribution and 100% of term loan.

II. HACCP/ ISO Standards/Food Safety/Quality Management Systems

The main objective of the scheme is to motivate the food processing industry for adoption of food safety and quality assurance mechanisms such as TQM including ISO 9000, ISO 22000, HACCP, GMP, and GHP. This will enable adherence food processors to the stringent quality and hygiene norms thereby protecting the health of consumers enhance product acceptance by buyers, both domestic & overseas and keep Indian industry technologically abreast of international best practices.

Grant-in-aid is given in the form of re-imbursement of expenditure towards implementation of HACCP/ ISO Standards/ Food safety/ Quality Management Systems @ 50% in general area and @ 75% in NE Region and difficult areas of eligible project cost subject to maximum of Rs. 17 lakh and 22 lakh respectively.

For complete details please visit Ministry of Food Processing Industry, website <http://www.mofpi.nic.in/Schemes/pradhan-mantri-kisan-sampada-yojana>

Annexure - II

Approved Cold Chain Projects in Andhra Pradesh as on 31.08.2017

S.	Project	Sector	District	Date of Approval	Project cost (Rs. In Crore)
1	Nekkanti Sea Foods Ltd	Seafood	East Godavari	22.05.2015	48.32
2	Synthite Industries Ltd	F&V, Spices	Guntur	26.05.2011	29.43
3	Farm Gate Agro Milch Pvt Ltd	Dairy	Chitoor	17.04.2017	44.25
4	Devi Sea Foods Ltd	Fishery	Prakasham	17.04.2017	42.27
5	Andhra Pradesh State Warehousing Corporation	Fishery	Nellore	17.04.2017	34.62
6	Devi Aqua Tech Private Limited	Fishery	East Godavari	17.04.2017	63.7
7	Tirumala Milk Products Pvt Ltd	Dairy	Nellore	24.04.2017	31.87
8	Sandhya Marines Ltd.	Fishery	West Godavari	19.04.2017	14.02
9	Sandhya Aqua Export Pvt Ltd	Fishery	East Godavari	19.04.2017	59.97
10	Total				368.45

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Andhra Pradesh - District Wise production clusters of fruits & Vegetables

DISTRICT	ESTIMATED TOTAL [in000 MT]	MAJOR FRUITS	PRODUCTION (F & V) MAJOR VEGETABLES
Anantapur	3,211.00	Banana, Sweet, Orange/ Mosambi, Mango, Papaya, Watermelon,	Tomato, Green Chilli, Onion
Chittoor	2,621.00	Mango, Papaya, Banana	Tomato, Brinjal, Beans, Okra
Kadapa	2,100.00	Banana, Sweet, Orange/ Mosambi, Mango, Papaya	Tomato, Brinjal, Green Chilli, onion
Kurnool	1,326.00	Banana, Sweet, Orange/ Mosambi, Mango	Onion, Tomato, Green Chilli, Beans
East Godavari	1,203.00	Mango, Banana	Tomato, Brinjal, Tapioca

Government of India Sanctioned Food Parks in Andhra Pradesh:

Name	Location of Project	Extent	Status
Srini Food Park	Mogilli Village, Bangarupalyam Mandal, Chittoor District, Andhra Pradesh	140 acres	Operational
M/s. Godavari Mega Aqua Food Park Ltd	Tundurru Vill., Bhimavaram Mndl., West Godavari Dt	57.81 acres	Under Construction
M/s. APIIC Mega Food Park	Project Mallavalli Vill., Bapulapadu Mndl., Krishna Dt.	100 acres	Under Construction
M/s. Nekkanti Mega Food Park Pvt. Ltd. (Mega Food Park)	Kothapatnam Village, Kota Mandal, Nellore Dt.	52.22 acres	Under Construction
M/s. SH Food Processing Pvt. Ltd. (Mega Food Park)	Kothapatnam Village, Kota Mandal, Nellore Dt.	53.74 acres	Under Construction
M/s. North Coastal Integrated Food Park Pvt. Ltd	B.P. Varakattu Village, Cheepurupalli Mandal, Vizianagaram Dt	37.89 acres	Under Construction
M/s. Vyshnavi Mega Food Park Pvt. Ltd. (Mega Food Park)	Pedduru Village, Santhipuram Mandal, Chittoor Dt.	100 acres	In principle Sanction
M/s. Sri Varsha Integrated Food Park Pvt. Ltd. (Integrated Food Park)	Settigunta Village Rly Kodur Mandal, Kadapa Dt	44.78 acres	In principle Sanction

Name	Location of Project	Extent	Status
M/s. Sri Chandana Food Park Ltd. (Integrated Food Park)	Marupalli Village, Gajapathinagaram Mandal, Vizianagaram Dt.	40 acres	In principle Sanction
M/s. Patanjali Food and Herbal Park Pvt. Ltd.	Chinnaraopalli (V), Kothavalasa (M), Vizianagaram, Andhra Pradesh.	172.84 acres	In principle Sanction
M/s. Aveena Mega Food Park Andhra Pvt. Ltd.	Anantapur	50 acres	In principle Sanction
M/s. North Andhra Mega Food Park Pvt. Ltd	Srikakulam	60 acres	In principle Sanction
M/s. Safe n Fresh Integrated Food Park Pvt. Ltd	K.K. Gunta Village, Dagadathi Mandal, Nellore District, Andhra Pradesh	53.74 acres	In principle Sanction
M/s. Specialized SRK Foods Pvt. Ltd APIIC Industrial Area,	Thatiguntapalli Village, Vayalpadu Mandal, Chittoor District, Andhra Pradesh	45 acres	In principle Sanction
M/s. Jain Irrigation Systems Ltd	Thangadancha Vill., Jupadu Banglow Mndl., Kurnool Dt.	623.40 acres	Under Construction



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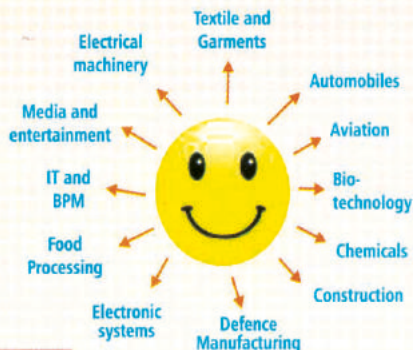
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SIDBI Make in India Soft Loan Fund for Micro Small & Medium Enterprises (SMILE)



Objective

- To help MSMEs spearhead the "Make in India" programme.
- To provide soft loan, in the nature of quasi-equity, and term loan on relatively soft terms to MSMEs to meet the required debt-equity ratio for establishment of an MSME as also for pursuing opportunities for growth for existing MSMEs.

Target MSME Sectors

- All the identified 25 sectors or other sectors as may be added, in the Make In India Programme. Deserving proposals from any other sector can also be assisted on merits.

Eligible Enterprises

- New enterprises in the manufacturing as well as services sector. Existing enterprises undertaking expansion, modernization, technology upgradation or other projects for growing their business will also be covered. Loans extended under the scheme cannot be used for repayment of earlier loans.

Minimum Promoter's Contribution

- 15% of project cost for projects up to ₹ 1 crore and 20% for the rest.

Term Loan

- Upto 75% of the project cost for all proposals.

Soft Loan

- 10% of the project cost subject to a maximum of ₹ 20 lakh.
- Up to 15% of the project cost for the enterprises promoted by Scheduled Caste (SC) / Scheduled Tribe (ST) / Persons with Disabilities (PwD) and women, subject to a maximum of ₹ 30 lakh.
- On expiry of 3 years from the date of first disbursement, the outstanding soft loan together with any dues thereon shall be converted into secured term loan and the entire loan shall carry applicable rate of interest as per internal rating of the borrower.

Upfront fee

- Upfront fee of 0.5% plus applicable service tax.

Rate of Interest

- On soft loan - Prevailing concessional rate of interest as applicable under the scheme from time to time. Presently 8% - 9% p.a.
- On term loan - Prevailing concessional rate of interest as per applicable rating under the scheme from time to time. Presently 8% 9% p.a. for 3 years, subject to eligible rating grades.

Minimum Term Loan Size

₹ 25 Lakh for new as well as existing enterprises.

Repayment Period

- Not exceeding 7 years inclusive of the moratorium upto 1-1/2 year for term loan and upto 2 years for soft loan.

Security

- As applicable under the scheme.

Other conditions

- As applicable under the scheme.

For enquiries, please contact the nearest SIDBI office



Second Floor, Corniche Square, Plot No.67, Gurunanak Nagar Colony,
 Opp. APIIC Head Office, Vijayawada - 520 008.
 Telefax : 0866-2544228. E-mail : vijayawada@sidbi.in



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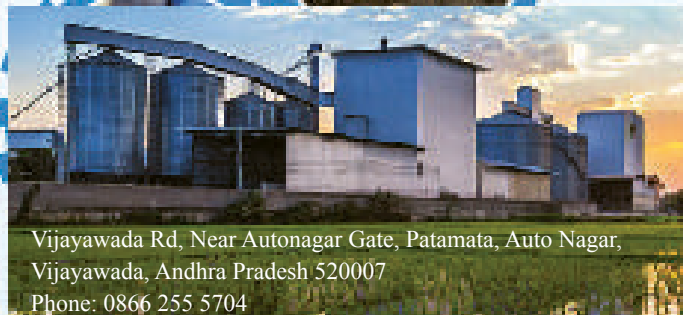
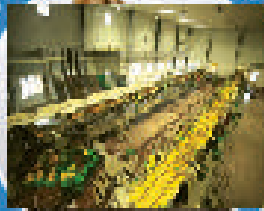
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