

NUTRILICIOUS

Breastfeeding bond, the purest connection...

Celebrating

INTERNATIONAL YEAR OF MILLETS

Part 2

- Indigenous millets
- Millets for various lifespan
- Mineral richness of Millets

World Breastfeeding week special



Nutrigen

PG Studies in Food Science & Nutrition
Alva College, Moodbidri

DEPT. OF PG STUDIES IN
FOOD SCIENCE AND NUTRITION
ALVA'S COLLEGE, MOOBBIDRI

Dig in and go deep...

- Departmental Nutri Products
- Novel Research Insights
- Departmental Activities

Fruit of the season

Rambutan



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Departmental website



THE EDITORIAL DESK

Here's another maiden issue of our department Newsletter, **Nutrilicious** is out....**Millets, the Miracle grain –Part 2** in addition to World's Breast Feeding Week Celebration. As it's the international year of the millets, it's our onus to facilitate our commitment to enhance individual performance through appropriate actions to provide total nutrition security with regard to millets right from the foetal life.

For centuries, millets have been a part of the culture and traditions of a large population. Millets are the preferred cereal crops in many states, because of their higher productivity, capacity to grow on poor soils with little or no inputs, short growing season, and ability to survive adverse climate conditions. Millets also provide an alternative food system in times of increasing demand for vegetarian foods.

It is hoped that the International Year of Millets will raise awareness about the contribution of millets to combat the lifestyle diseases and strategies to lower the risk of diseases. In line with this mission, this newsletter is a sincere effort focusing on Millets – Part 2 . This miracle grain, not only add value to the diets, but make current scientific knowledge existing in the area of health and nutrition easily available. Lastly, I would like to express my heartfelt thanks to our beloved Chairman Dr. Mohan Alva, our trustee Mr. Vivek Alva. Principal and Administrative officer for their continuous guidance and motivation.

I sincerely hope that the readers finds this issue more interesting and intellectually stimulating to inculcate millets with diverse foods as an healthy choice to step up healthy lifestyle.

Happy Reading...!!!!

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Fruit of the season

Rambutan (*Nephelium lappaceum* L.)

The potential of rambutan seed extract to reduce risk of cardiovascular disease in diabetes mellitus type 2

Study aimed to find out the potential of ethanol extract in rambutan seed to reduce the risk factors of cardiovascular disease. The animals used for this study were 3-4 months old male wistar mice with 20-25 grams weight. The diabetes mellitus induction type 2 to the animal model was performed through the administration of high fat diet for 4 weeks followed by the daily dosage of Streptozotocin (STZ) 40 mg/kgbw and it was repeated for 4 times in the last week of induction. The administration of 70% ethanol extract of Binjai rambutan seed (*Nephelium lappaceum* L.) was done in Carboxy Methyl Cellulose 0.5% and metformin as positive control. The result indicated that 70% ethanol extract of Binjai rambutan seeds had a significant effect on the atherosclerosis index ($P < 0.01$) and all lipid profile parameters. It can be concluded that the rambutan seed extract at the dose of 19.2 mg/kgbw had the potential to **reduce the risk of cardiovascular diabetes** in mice by increasing lipid fraction and decreasing oxidative stress.

Reference: Susilowati, R. (2018). The Potential of Rambutan Seed Extract to Reduce Risk of Cardiovascular Disease in Diabetes Mellitus Type 2.

Rambutan rind in the management of hyperglycemia

The rambutan (*Nephelium lappaceum* L.) fruit's rind has been shown to be effective in inhibiting the carbohydrate hydrolyzing enzymes, alpha glucosidase and alpha amylase. The rind of *N. lappaceum* L., an exotic fruit found in the tropics, has been previously shown to have high antioxidant activity, significant total phenolic content, low pro-oxidant capacity as well as not being cytotoxic. Its powdered rind was also shown to have heavy metal content far below the permissible levels for nutraceuticals. There has been a great interest in the potential health benefits of exotic fruits due to its anti-oxidant content as well as bioactive compounds. These findings support the use of *N. lappaceum* rind extract in the **management of type 2 diabetes**.

Reference: Palanisamy, U., Manaharan, T., Teng, L. L., Radhakrishnan, A. K., Subramaniam, T., & Masilamani, T. (2011). Rambutan rind in the management of hyperglycemia. *Food Research International*, 44(7)

Pulp- Abundant of carbohydrates, fats, proteins, phosphorus, iron, vitamin C, calcium and flavonoids

Seed- Abundant source of fats at 38.9%. The main fat is oleic acid, which is an omega-9 fatty acid



Peel- Phytochemical compounds that exhibit antioxidant, antimicrobial, antidiabetic, antiviral, anti-inflammatory, anti-hypoglycemic and anti-proliferative effects

"Revitalize your body with wholesome nutrition"

INDIGENOUS MILLETS

BROWN TOP MILLET



- Sama and korne has a limited cultivation largely confined to southern India.
- It is gluten-free and rich in nutrients that are essential for the body.
- Brown Top Millet comprises 12.5% fiber, which acts as a medicine to deal with several lifestyle diseases.
- Consumption of Brown Top Millet regularly leads to a lower risk of cardiovascular diseases, duodenal ulcers, and hyperglycemia or diabetes.

COIX LACRYMA



- Grain coix is popular in Chinese traditional medicine and used in soups and beverages.
- Coix seeds contain phenols, flavonoids, polysaccharides, proteins, fibers, vitamins and oils.
- Coix seed constituents have strong antioxidant, anti-inflammatory, anti-obesity activity, stimulate reproductive hormones, promote uterine contraction and modulate gut microbiota.

FONIO



- This cereal has excellent culinary and nutritional properties. it contains amino acids like methionine and cystine which are essential to human health.
- As fonio is known to be easy to digest, it is traditionally recommended for children, old people who cannot digest other cereals, sick people and for people suffering from diabetes or stomach diseases.

TEFF



- Teff (*Eragrostis tef*) is a cereal globally popular due to the attractive nutritional profile such as gluten free and high dietary fiber content.
- Whole grain teff flour becomes increasingly important in healthy food market, and has been used to produce various gluten free food items such as pasta and bread

Revitalizing millets:

NOVEL RESEARCH INSIGHTS

Weaning or complimentary foods by millets addition

Weaning mixtures containing pearl millet, cow pea or mung bean, SMP, sugar, and ghee were well tolerated and had a long shelf life. A supplementary meal made from malted foxtail millet flour, wheat flour, skim milk powder, whey protein concentrate (WPC), ghee, and sugar and compared to commercially available cereal and milk solid based supplemental foods (Cerelac). According to his findings, the malted foxtail millet had the highest overall acceptance when combined with wheat flour in ratio of 30% to 40%. The storage investigations demonstrated that the product is suitable for 45 to 60 days and may be manufactured at both the industrial and domestic levels due to its simple formulation and has strong nutritional qualities. Germinated, popped, and roasted millet flours, together with milk solids; legume flour, and other cereals, have been utilised to make low-cost weaning and supplementary meals.

Reference: International Journal of Scientific Research and Engineering Development-- Subhash Prasad

Plant-Based (Dairy-Free) Beverages

Ragi grains that have been sprouted are utilized to get milk from Ragi. Foxtail millet and Proso millet are two more millets that are used to manufacture millet milk, which is then utilised to manufacture a variety of vegan treats. Quinoa milk has 5.66 times more protein than rice milk and half the protein level of cow's milk. Quinoa milk has much lower cholesterol and salt levels than cow's milk. Barnyard millet, little millet, kodo millet and finger millet-based millet milk can be a substitute for dairy beverage and can be consumed by all age group of people.

Reference: Deora, N., & Deswal A. (2018). Non-dairy based beverages: an insight. Journal of Nutrition, Food Research and Technology; 1(1), 1-4.

Probiotic Milk-Millet Beverages

It is better opportunity into the field of functional food is the addition of millet to milk or milk products. Millets serve as a dietary substrate for probiotics, improving flavour, texture, and overall acceptability. The beverage was made from cooked finger millet inoculated with *Lactobacillus casei*431, sugar, fresh cow milk, and cocoa powder.

Reference: Elisa Di Stefano *et al* (2017). A Novel Millet-Based Probiotic Fermented Food for the Developing World. *Nutrients*, 22;9(5):529

Value-added paneer

Value-added paneer was prepared to improve the fiber content in the otherwise fibre-deficient paneer. Cereals like wheat and finger millet at 1% level was included in the preparation of paneer. An inclusion level of more than 1% caused pasty consistency. Sensory analysis was also carried out on the designed paneer. It was found that there was no significant difference in the flavor and overall acceptability between the designer paneer and control samples. Texture analysis was carried out for various attributes. It was found that wheat-based paneer was equal to control samples in terms of adhesiveness which may be due to the pasty nature of the wheat flour. However, this designed paneer had overall acceptability and could be used as a value added product.

Reference: Narayanan, R. (2014). Designer paneer. *Afr J food Sci*, 8, 442-446.

MILLETS....

for various life span



Adolescence period...

- Vital for the growth, development, and maintenance of the body. Aid in bone development. The presence of iron assists in blood formation and prevents anemia. Provide sustained energy while keeping them satiated for longer periods.
- Play a vital role in brain development and maintaining optimal cognitive abilities.

During pregnancy....

- High fiber content -aids in digestion and prevents constipation.
- Low glycemic index -help regulate blood sugar levels, reducing the risk of gestational diabetes during pregnancy.
- Low in calories and fat- beneficial for managing weight gain during pregnancy.
- Millets, such as finger millet (ragi) and pearl millet (bajra), are good sources of iron and can help in the production of red blood cells and prevent anemia.

Lactation period...

- Lactating women are advised to consume Ragi as it helps to increase the production of breast milk.
- This will enable the mother to feed the child for a longer period of time.
- Ragi proves to be a great cereal for pregnant and lactating women due to its high calcium and iron content.
- Weak estrogenic and anti-estrogenic properties of millets enables them to interact with estrogen receptors and help in managing hormonal imbalances

Menopause phase...

- Phytoestrogens helps in hormone balance and reduce symptoms like hot flashes and mood swings.
- Maintains strong bones and reducing the risk of fractures.
- Millets, such as pearl millet and finger millet, are rich in fiber, magnesium, and potassium, which are beneficial for cardiovascular health.



BEST OF DEPARTMENTAL SEMINARS

DASH Diet

DASH stands for Dietary Approaches to Stop Hypertension and focuses on vegetables, fruits and whole grains. It includes fat-free or low-fat dairy products, fish, poultry, beans and nuts. The diet limits foods that are high in salt, also called sodium. It also limits added sugar and saturated fat, such as in fatty meats. DASH diet has shown a number of benefits, It lowers blood pressure for people with hypertension, and also for people who have blood pressures in the normal range, whether or not they lower their sodium intake. Reductions in pressure occur within one week and keep dropping if sodium restriction is ongoing. It has been shown to reduce the risk of sudden cardiac death on the order of approximately 13% decrease in 10-year Framingham CVD risk. It is helpful with weight loss. DASH diet significantly reduced BP in patients with stages 1 and 2 hypertension on a control diet. These results have important implications for the treatment of patients with essential hypertension.

SUSHMITHA A.L
2nd MSc FSN

KHASI

The Khasis inhabit the Eastern parts of Meghalaya, in Khasi and Jaintia Hills. They are also known as Pnars. Khasi people form the majority of the population of the eastern part of Meghalaya & is the state's largest community, with around 48% of population of Meghalaya. Familiar recipes of khasi are Lal Chai (Red tea), Rice Beer & Rice Wine, Pork Pickle, Pork Sausage, Fermented Fish Chutney, Pork Salad, Rice cooked with pork blood, Fermented rice cakes, Pork-Pumpkin curry, Dry fish curry, Fermented soybean preparation with pork. Most of the recipes are done from locally available plants, herbs, and therefore they are socially accepted and economically favourable. Khasi is rich in traditional cuisines based on meat. Since people of Khasi are living in forest-hilly region, they are very much aware of plants which has medicinal properties and their preparations and consumption in daily life

ANJALI R GOWDA
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BLACK RICE

Black rice is a super food, also known as forbidden rice or emperor's rice, is a type of heirloom rice that has a distinct deep black or purplish color, originated in china. Today, black rice is becoming increasingly popular for its unique taste, vibrant color, and numerous health benefits. It has antioxidant and anti-inflammatory effects because it contains higher amount of anthocyanins (cyanidin-3-glucoside) which associated with reducing oxidative stress and inflammation in the body, potentially offering protective effects against chronic diseases such as cardiovascular disease, cancer, and neurodegenerative disorders. The higher fiber content present in black rice helps to lower cholesterol levels and supports healthy blood pressure, reducing the risk of cardiovascular problems.

YASRIN P Y
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DESSERT WITH BREAKFAST

Dessert with breakfast diet is consuming a carbohydrate-rich, protein-packed breakfast that includes dessert. Eating dessert at the morning time helps to activate the metabolism of the body, which gives instant as - well - as slow release of glucose, which in turn keeps body active throughout the day. Dessert in breakfast gives satisfaction and avoid weight regain by reducing the cravings. This diet helps to reduce the hunger and food cravings, which helps to loose and maintain the body weight.

NIKSHITHA
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HIDDEN HUNGER

Cereal-based diets of the people in developing countries are qualitatively deficient in micronutrients-vitamins and minerals due to low intake of vegetables, fruits, legumes and foods of animal origin. Consumption of nutritious millets has also come down in India. Studies in several countries in Asia, and India show that with education and advocacy even farmers with small and marginal land holdings can be persuaded to raise homestead vegetables and fruits gardens and increase household vegetables consumption. For best results, the community, especially the mothers have to be educated about the importance of nutrition for health and wellbeing. Studies done by the authors in the villages of Medak district, of the South Indian state of Telangana, show remarkable improvement in the knowledge of food, nutrition, hygiene and health of mothers with children under 3 years of age, with education-behavioral change communication. Impact of nutrition gardens had positive impact on the household consumption of vegetables.

RATHUL SASIDHARAN
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Departmental Nutri products

Fortified and Enriched with
Millets !!!

Vegan Bajra Malt

- Energy : 770.76 kcal
- Protein : 10.8g
- CHO : 130.49g
- Fat : 22.84g

- High in Protein and fiber and good for diabetes and heart.



Millet Brownie

- Energy : 190.75 kcal
- Protein : 3.2g
- CHO : 32.4g
- Fat : 3.95g

- Rich in niacin.
- Good for healthy skin and organ function.



Millet Mysore pak

- Energy : 155.6 kcal
- Protein : 1.55g
- CHO : 20.1g
- Fat : 7.63g

- It helps to control cholesterol levels and reduce hypertension.



Foxtail millets Badusha

- Energy : 185.6kcal
- Protein : 2.4g
- CHO : 24.7g
- Fat : 8.7g

- Maintaining a healthy heart, smooth functioning of the nervous system.



Bajra Mix

- Energy : 89.66 kcal
- Protein : 2.41 g
- CHO : 16.87 g
- Fat : 1.112 g

- High in Protein and fiber and good for diabetes and heart.



Millet Mithai

- Energy : 55.6kcal
- Protein : 0.82g
- CHO : 7.8g
- Fat : 0.15g

- Calcium and magnesium plays a crucial role in maintaining bone health.



Ragi Flax Burfi

- Energy : 133.3kcal
- Protein : 2.12g
- CHO : 26.06g
- Fat : 2.26g

- The Omega-3 fatty acids and antioxidants contribute to healthy skin and hair.



Siri Murukku

- Energy : 79.42 kcal
- Protein : 2.68 g
- CHO : 6.77 g
- Fat : 1.54g

- Healthy digestion, regular bowel movements, boosts immune system & rich in iron.





Breastfeeding

MYTH BUSTER

Exercise will affect the taste of your milk.

Exercise is healthy, also for breastfeeding mothers. There is no evidence that it affects the taste of your milk.

You cannot drink water while you are breastfeeding.

There isn't any reasoning behind this statement. Mothers who are breastfeeding can eat and drink without worries.

Don't breastfeed if you're sick, it can pass to your baby.

When you get sick with a cold, flu or infection, germs do not pass through your breastmilk, but the antibodies do. And so breastfeeding while you are sick works to protect your baby from becoming sick.

Breastfeeding can result in sagging breasts.

Anyone who goes through pregnancy will notice breast changes. That, plus the natural effects of aging and weight gain are what cause sagging breasts, not nursing itself.

It will be hard to breastfeed if breasts are smaller in size.

Breasts of all sizes can make plenty of milk. Your baby can feed successfully regardless of the size of your breasts.

Mineral Richness of Millets:

Unearthing Nature's hidden gems

Calcium

- Essential for maintaining healthy bones and teeth, supporting other bodily functions.
- Ragi contains 344mg/100g calcium.

Copper

- Involved in production of red blood cells, connective tissue formation, and iron absorption.
- Acts as an antioxidant and supports the functioning of the immune and nervous systems.
- Ragi contains 344mg/100g.

Potassium

- Crucial for maintaining healthy heart function, regulating blood pressure
- Support proper muscle and nerve function.
- Role in fluid balance within the body.
- Ragi contains 408mg/100g

Manganese

- Vital role in various enzymatic reactions, bone health, and carbohydrate metabolism.
- It also acts as an antioxidant and contributes to the formation of connective tissue.
- Ragi contains 5.49mg/100g.

Iron

- Essential for the production of red blood cells and oxygen transportation in the body.
- Helps to prevent iron deficiency anemia and boost energy levels.
- Little millet contains 9.3 mg/100g iron.

Zinc

- Involved in numerous enzymatic reactions and
- Essential for immune function, wound healing, DNA synthesis, and normal growth and development.
- Samai contains 3.7mg/100g.

Magnesium

- Plays a vital role in energy production, muscle and nerve function.
- Maintains a healthy immune system.
- Helps to regulate blood pressure and supports bone health.
- Jowar contains 171mg/100g.

Phosphorus

- Aids in the formation and maintenance of healthy bones and teeth.
- It also contributes to energy metabolism, kidney function, and cell repair.
- Bajra contains 296mg/100g.

DEPARTMENTAL ACTIVITIES

Samrudhi Mela



Alumini association meet



Nutrition education program

Campus Placement

Association activity



Common Seminar



Webinar

International women's day celebration