



Linking Nutrition Research to Practice

MESSAGE

FROM EDITORS

Dear Members,

We would be glad to know our readers' feedback including your views, thoughts and valuable ideas to improve this newsletter. Not only innovative suggestions, constructive criticism would also be highly appreciated.

Meanwhile, we would like to gently remind you of the following important deadlines.

- ▶ Deadline of abstract submission for SLMNA sessions 2018 — 30th September
- ▶ Deadline of registration for LLL live programme in October 2018 for MD and MSc. trainees in Nutrition — 30th September

Lastly, here is a kind reminder to share your articles through our newsletter. Your clinical experiences, review articles or any kind of writing with a clinical nutrition importance can simply be sent to slmna2015@gmail.com to grab the opportunity of being a part of the SLMNA newsletter.

Make it a September to Remember!

CO - Editors
 Malika & Piyumanga

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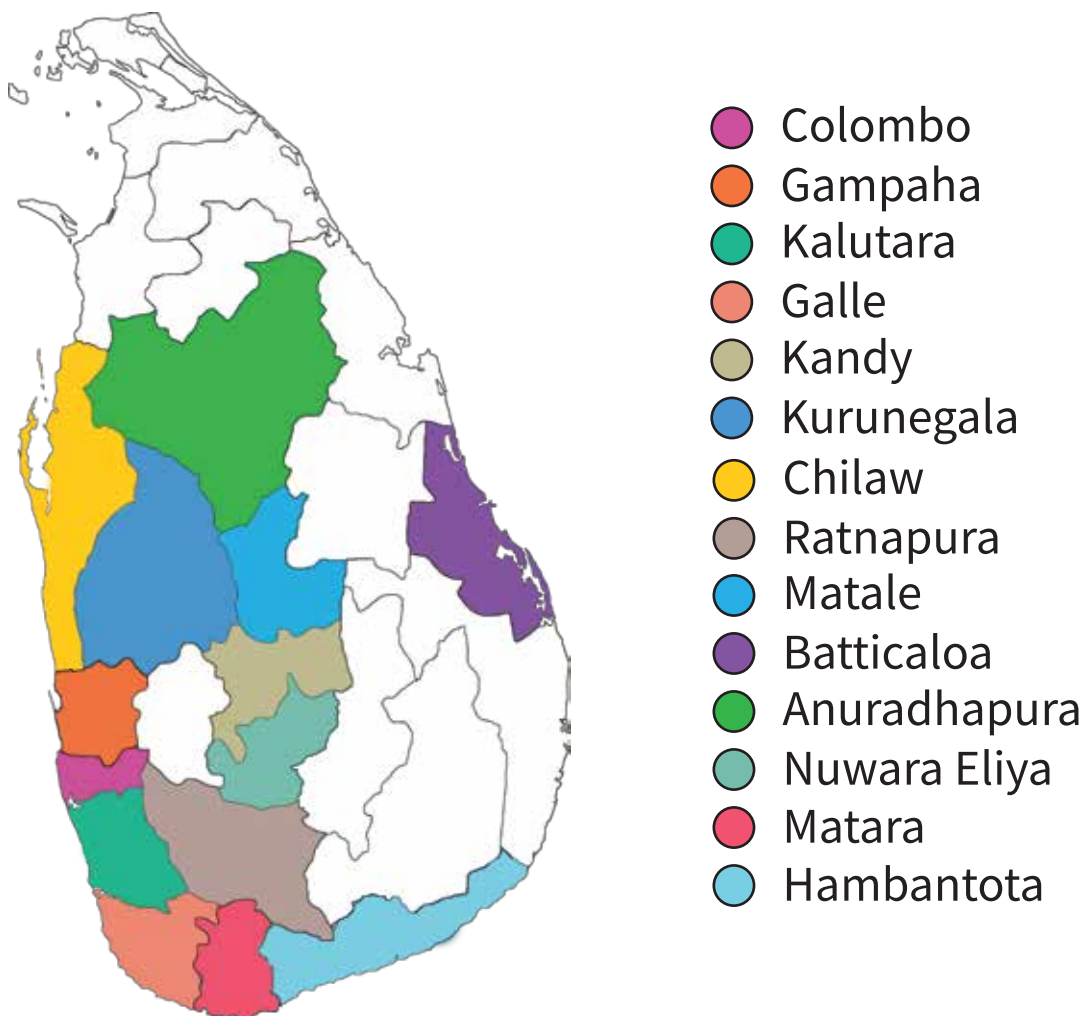
01. Past events
02. Capture of the month
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01. Medical Nutrition Unit Evaluation – 2018

Due to non-availability of a comprehensive programme to train medical professionals in nutrition, MSc in Human Nutrition stream was established in 2013 at the Post Graduate Institute of Medicine for the first time in Sri Lanka. Medical Nutrition Units are established in all major hospitals in the country providing this professional service by MBBS and MSc Human Nutrition qualified medical officers. Currently there are 28 medical nutrition units in the country and 14 districts are being covered islandwide. Ministry of health performed an evaluation of existing medical nutrition services of the country on 26th July 2018.

Medical officers of nutrition representing all the medical nutrition units presented their statistics highlighting the constraints and strengths.

Districts providing medical nutrition services in Sri Lanka



**Statistics summary of Medical Nutrition Units in Sri Lanka
From January to June 2018**

Hospital	OPD and clinic referrals	Inward Referrals	ICU
Teaching Hospitals			
National Hospital of Sri Lanka	1372	560	2959
Lady Ridgeway Hospital for Children	2828	815	373
Colombo South Teaching Hospital	348	265	386
Colombo North Teaching Hospital	802	382	112
Teaching Hospital Kandy	597	170	75
Teaching Hospital Peradeniya	400	215	29
Sirimavo Bandaranayake Specialized Children's Hospital- Peradeniya	782	169	35
Teaching Hospital Kurunegala	1106	724	131
Teaching Hospital Anuradhapura	369	229	180
Teaching Hospital Batticaloa	227	114	65
Teaching Hospital Karapitiya	338	191	40
Special Care Institutions			
De soyza Maternity Hospital for women	689	-	-
Castle Street Hospital for women	1897	674	25
National Institute of Mental Health	65	352	0
National Institute for Nephrology, Dialysis and Transplantation - Maligawatta	347	205	44
Rheumatology and Rehabilitation Hospital Ragama	318	172	-
Sri Lanka Navy Hospital	367	82	10
Other Hospitals			
BH Awissawella	247	71	54
PGH Rathnapura	248	72	
BH Panadura	293	64	77
BH Gampola	223	61	29
DGH Hambantota	486	89	29
DGH Nuwaraeliya	271	98	117
DGH Dickoya	211	37	1
DGH Negombo	288	77	69
DGH Matale	335	361	146
DGH Kalutara	589	17	32
Sri Jayewardenepura General Hospital	-	320	71

02. PENSA 2018 - Korea

A team of Sri Lanka Medical Nutrition Association represented the 19th congress of Parenteral and Enteral Nutrition Society (PENSA) held in South Korea on 3rd June 2018. The president and vice presidents of SLMNA with more than 20 SLMNA members participated in this event.

Dr. Renuka Jayatissa, the President of SLMNA and Dr. Ranil Jayewardane, Prof. Sudheera Kalupahana, vice presidents of SLMNA also delivered informative lectures on representing our motherland in this South Asian forum.



“ A simple act of
Kindness can make a
tremendous impact on
a person’s life ”



Incredible Egg Facts

- Versatile in food industry
- Excellent quality protein
- Economical



Eggs are natural sources of high quality protein and many other nutrients, all for 70 calories per a large egg. Eggs play a role in many ways. Public health messages on egg consumption has evolved over the past few years. Many international health organizations have included regular egg consumption as a part of a healthy, balanced diet in their dietary recommendations.

Eggs are one of the highest quality protein sources, and for this reason scientists use eggs as a standard for measuring the quality of other protein containing foods. Eggs are also an “excellent” (20% or more of the daily value) or “good” source (10-19% of daily value) of the following nutrients compared to the daily value (based on a 2000 calorie diet)

Choline (23% Daily Value)

Is essential for the normal functioning of all cells, including those involved with metabolism, brain and nerve function, memory and the transportation of nutrients throughout the body. Choline also help to prevent birth defects and promotes brain and memory development in infants.

Selenium (23% Daily Value)

Acts as an antioxidant to protect the body from oxidative damage. Selenium works hand in hand with vitamin E to protect cell membranes from chronic damage.

Riboflavin (14% Daily Value)

Helps to produce energy in mitochondria of all the cells of the body.

Vitamin B12 (11% Daily Value)

Works with choline and folate for normal nerve cell function and cell division.

Phosphorus (10% Daily Value)

Is essential for healthy bones, teeth and cell membranes and is also required for energy production in the body.



The antioxidants choline and lutein have been associated with eye health since they can help reducing cataract and slows progression of age related macular degeneration. Choline and lutein in eggs are tied to early cognitive development and academic performances. High quality proteins in egg are essential for building muscles and to maintain lean body mass hence it improves muscle functions. Eggs are with limited naturally occurring sodium (71 mg per large egg compared to recommended < 2300 mg daily)

An egg's nutrient profile

Compared to the Daily Value , one whole egg provides

Nutrient	Daily Value
Choline	23 %
Selenium	23 %
Protein	13 %
Riboflavin	14 %
Vitamin B 12	11 %
Phosphorous	10 %
Pantothenic acid	7 %
Folate	6 %
Iron	5 %
Vitamin A	5 %
Vitamin D	6 %
Zinc	4 %
Vitamin B6	4%

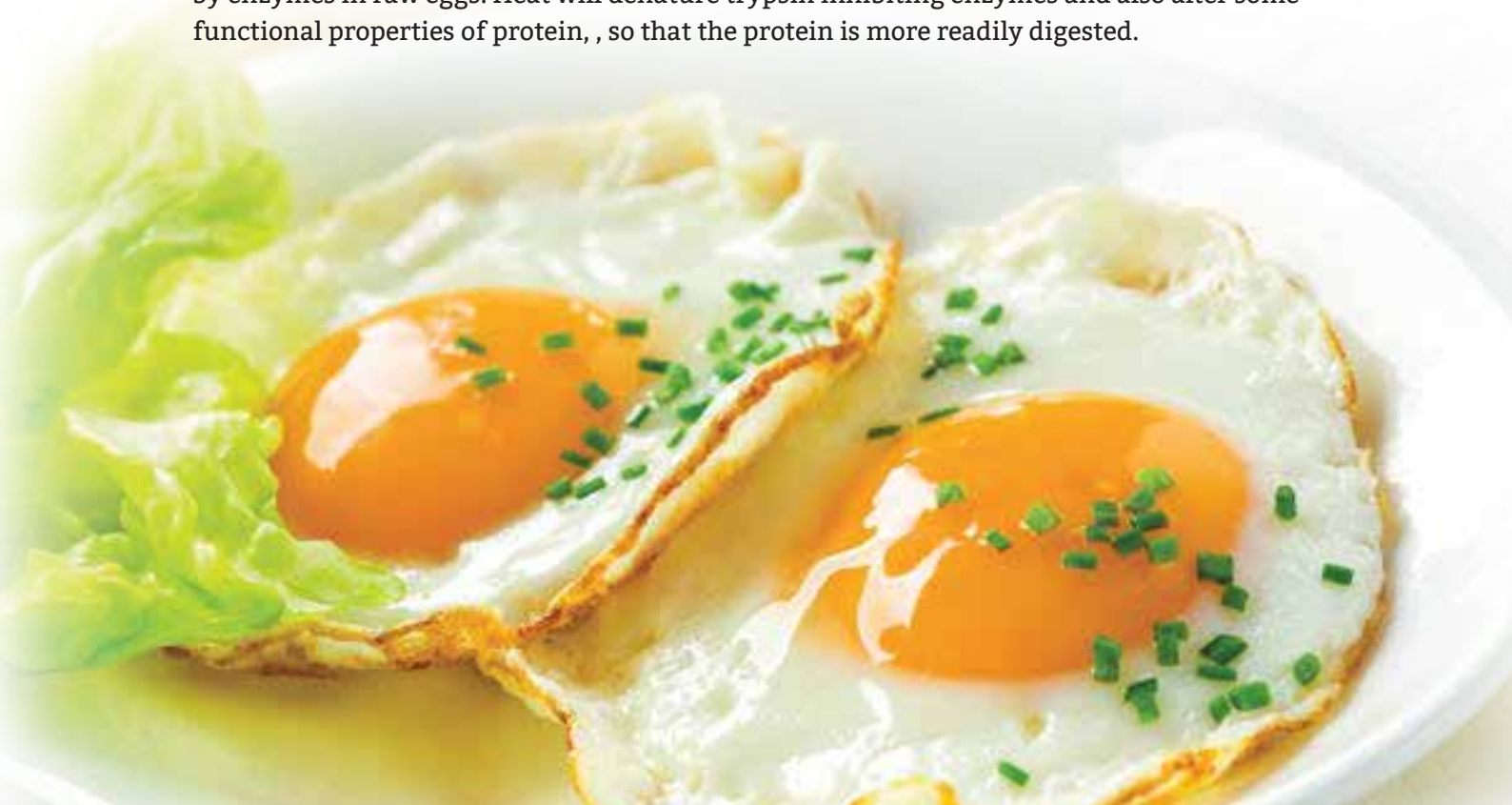


Cooked eggs vs raw eggs

Digestibility and absorption of egg protein is much greater in cooked eggs than raw eggs. One study published in the journal of nutrition found that the availability of egg protein is 95% in cooked eggs while it is 50% with raw eggs. Cooking of eggs can also help to prevent food borne illnesses.

The higher digestibility of protein in cooked eggs is likely due to

- ♦ Structural changes caused by cooking.
- ♦ Trypsin Inhibitors - Trypsin is an enzyme that breaks down proteins. This may be blocked by enzymes in raw eggs. Heat will denature trypsin inhibiting enzymes and also alter some functional properties of protein, , so that the protein is more readily digested.



How to select fresh eggs?

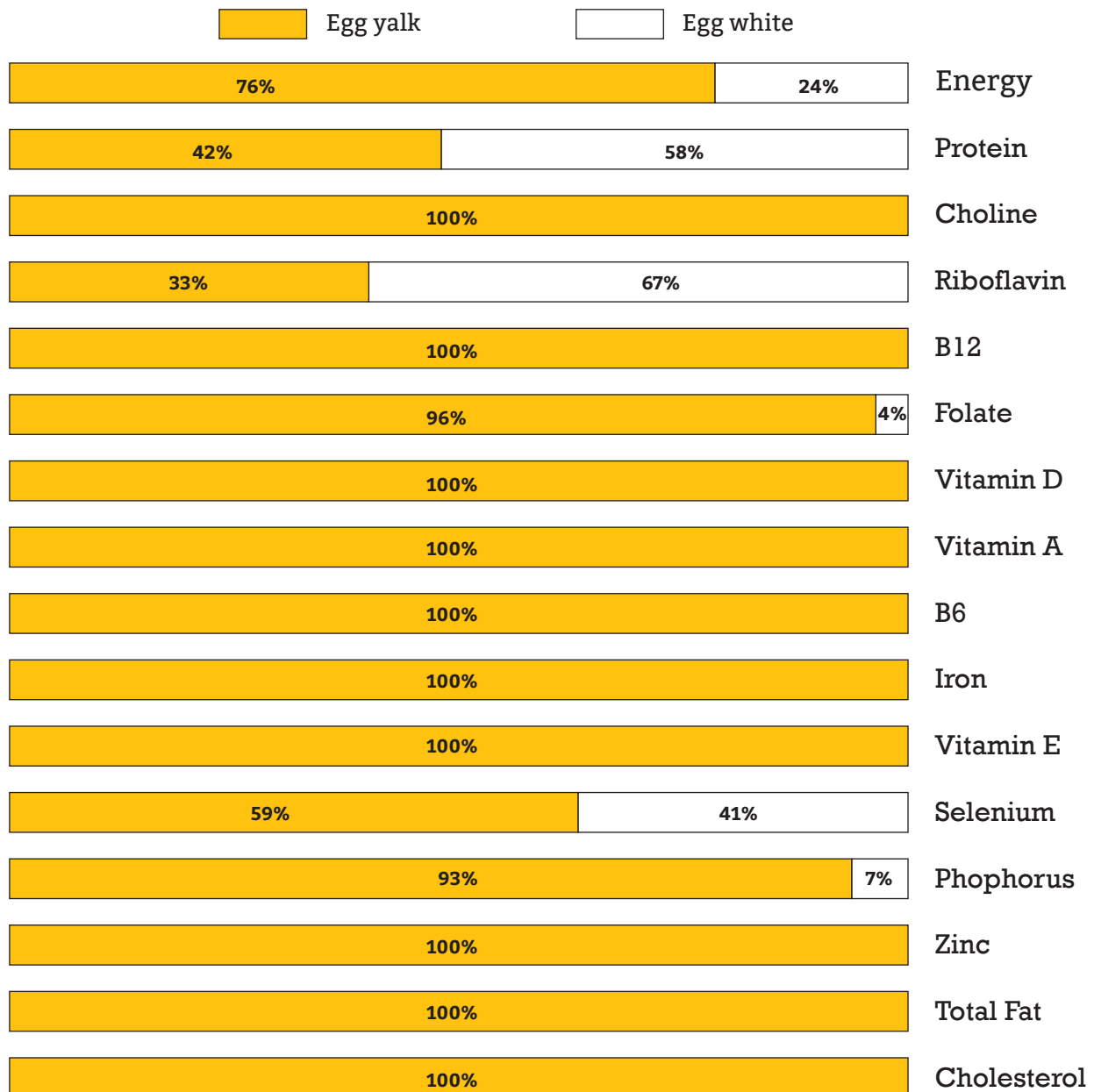


Very fresh egg will sink to the bottom and lay on it's side.



Old eggs will be floating, bobbing along the surface of water. These floaters should be tossed since it is not safe to consume.

Percentage of nutrients in egg yolk vs egg white



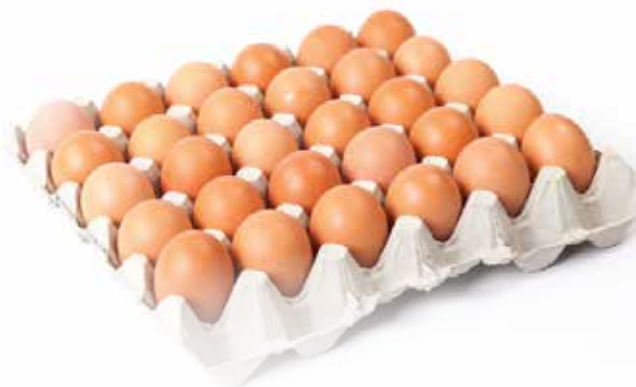
Egg yolk

- 42% of the protein in an egg
- 59% of the selenium in an egg – Relatively few foods contain the important antioxidant selenium which regulates thyroid function and helps prevent cell damage
- 100% of the zinc in an egg – Only the yolk contains the mineral zinc, which is especially important for normal growth and development during pregnancy; it's also necessary for wound healing and immunity. For people who don't eat much meat, egg yolks are one of the few sources of this nutrient.
- 100% of the iron in an egg
- 100% of the vitamin B6 in an egg –Vitamin B6 is critical for protein metabolism. Vitamin B6 is also important in immune function. It is found mainly in meat and poultry.
- 100% of choline in an egg – Choline is one of the most important reasons that pregnant women should consume eggs, as it is critical for brain development of a baby. The nutrient choline is also necessary for normal functioning of all cells. Choline is found in few other foods as commonly consumed as egg yolks; it's available in beef liver and chicken livers, cod and smaller amounts in cauliflower.



Storage and Safety of eggs

Food safety is a top priority when handling raw eggs. A contaminated hen can transmit *Salmonella* inside the egg if the shell has not completely formed. *Salmonella* can also penetrate egg shells, which have tiny open pores. According to the U.S. Food and Drug Administration, each year about 79000 cases of food borne illnesses and 30 deaths are caused by consuming eggs contaminated with *Salmonella enteritidis*. Implementing the preventive measures would reduce the number of *Salmonella enteritidis* infections from eggs by nearly 60 percent.



- ▶ Look for a sell-by date on egg cartons; eggs will generally last for four to six weeks after this date. Avoid packages with cracked eggs, which can increase risk of bacterial contamination. Discard a cracked egg if you discover one after purchase.
- ▶ Promptly refrigerate eggs in their carton at 40°F or below, in the coldest part of the refrigerator. Avoid storing in side doors where the temperature varies.
- ▶ Cook eggs until the whites and yolks have solidified, to prevent food-borne illness. Egg dishes should reach an internal temperature of 160°F. If using recipes for raw or undercooked eggs, use pasteurized eggs that are heat-treated to destroy bacteria.
- ▶ Don't allow cooked eggs or egg dishes to sit at room temperature for longer than two hours.
- ▶ Wash your hands and any surfaces with soap and water that have come in contact with raw eggs.
- ▶ Brown eggs are not more nutritious than white. The color and size of an egg are determined by the breed of hen, which can produce white, cream, brown, blue, green or speckled eggs! The color of the yolk is also not reflective of nutritional value but the type of poultry feed.



Healthy Egg recipes

Adding eggs to daily diet is a delicious way to get many nutrients.

01. Egg omelet with tomatoes, green leaves and herbs Served with atta roti and banana



02. Vegetable filled egg omelet



03. Potato and milk omelet for children



04. Egg rice



05. Egg salad with tomato and pulses



06. Egg soup



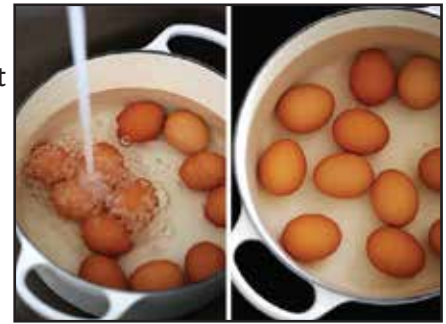
Storing Eggs

- ▲ Store in the refrigerator.
- ▲ Store eggs in refrigerator less than 40 F
- ▲ The egg rack of the refrigerator is not the best place to store eggs. because the temperature is warmer there than the internal shelves
- ▲ Store eggs in their original carton, in the coldest part of the refrigerator
- ▲ Use raw eggs within 3 weeks for the best quality
- ▲ Hard-boiled eggs should be cooked until white and yolk are completely set.
- ▲ Scrambled eggs should not be runny.
- ▲ Dishes containing eggs should be cooked to 160 F
- ▲ Do not keep cooked eggs in temperature danger zone 40 F -140F for more than 2 hours



How to do hard boiling of eggs

place eggs in a saucepan and cover with water.
Bring water to a boil, cover the saucepan, then turn off the heat
Let eggs stand in water for 15 minutes.
Remove eggs and place in a bowl of ice cold water to cool.



Why Is the Inside of a Hard-Boiled Egg dark in colour?

A dark ring on a hard-boiled yolk is a result of overcooking. It's caused by sulfur and iron compounds in the egg reacting on the yolk's surface.



Reference

1. American egg board
2. Egg nutrition center
3. U.S Food and drug administration
4. Campbell B et al. International society of sports nutrition position stand: protein and exercise. J Int Soc Sport Nutr. 2007;4:8
5. Evenopoeel P et al. Digestibility of cooked and raw egg protein in humans as assessed by stable isotope techniques. J Nutr. 1998.
6. US. Department of Agriculture, Agricultural Research Service, USDA Nutrient Data Laboratory. 2010. USDA National Nutrient Database for Standard Reference, Release 23. www.ars.usda.gov/nutrientdata.
7. United States Department of Agriculture



Do traditional rice varieties possess a nutritional advantage?

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Introduction

Rice is the staple food in Sri Lanka. It had been cultivated since times of ancient kings, and such rice were inherited from generation to generation naturally, having evolved into many different sub species. However, since late 20th century, with the arrival of chemical fertilizers, newly-improved varieties were introduced to the farmers to obtain a larger harvest.

But with the turn of 21st century, Sri Lanka confronts three major challenges with regard to rice. Firstly, the increasing prevalence of non-communicable diseases attributed with high dependence on consuming starch based diets (1). Secondly, the dependence upon chemicals to harvest rice (2). Thirdly, the growing incidence of chronic kidney disease which is closely associated with the heavy use of chemicals in harvesting (3).

The rice which were inherited through generations collectively called 'traditional rice varieties' regained its popularity amidst above challenges owing to traditional beliefs associated with them which arguably could provide an answer to the above challenges.

Traditional rice varieties were found to contain less arsenic, which is believed to be a contributory cause to chronic kidney disease in North Central Province (4). Meanwhile, many traditional healers, Ayurveda practitioners and Buddhist monks claim that traditional rice possess nutrient properties which prevent or cure various illnesses. Nutrient properties such as high fibre, vitamin, mineral content and possible functional components which contribute to improve glycemic control, reduce vitamin-mineral deficiencies, reduce cardio-vascular, liver, gall bladder and sexual organ diseases.

Search for evidence

Convenient sampling was carried out in Colombo, Gampaha, Kurunegala and Anuradhapura districts to identify the commonly available traditional rice varieties in the market.

A search for published data on nutrients of different rice varieties was carried out during the period of 24.07.2017 to 16.08.2017. The medical search databases PubMed and Google Scholar provided 15 articles which fell within search criteria. In addition further data were available in a book published by the Industrial Technology Institute (ITI) in 2011 (5).

Results

The ten most commonly available traditional rice varieties were:- Suwandel, Kalu Heenati, Sudu Heenati, Pachchaperumal, Madathawalu, Kuruluthuda, Maa wee, Dik wee, Batapolal, Ran Kahawanu. Other commonly available traditional rice varieties were:- Wannu Dahanala, Kahamala, El-haal, Masuran, Kuru Wee (Kahata Wee), Gonabaru, Goda Heenati, Beheth Heenati, Rathu Heenati, Rath Suwandel.

Comparison of Nutrients		
The Nutrient	Newly-improved rice	Traditional rice
	<i>mean (95% CI)</i>	<i>mean (95% CI)</i>
Glycemic Index (white bread = 100)	64 (55-73)	55 (51-61)
Fibre content	0.43 (0.25-0.58)	0.56 (0.3-0.8)
Anti-oxidants (KFeCN method)	0.88 (0.69-1.07)	2.16 (1.87-2.45)
Anti-glycation activity (%)	32.34 (29.8-34.8)	86.6 (84.7-88.5)
Protein (g)	7.8 (6.9-8.0)	10.1 (9.6-10.6)
Iron (mg)	1.91 (1.73-2.01)	2.51 (2.35-2.65)
Zinc (mg)	2.74 (2.20-2.83)	3.22 (3.08-3.36)
Selenium (ug)	0.32	0.69

Note that researchers had used rice with bran for the above analyses, and hence use of polished rice will reduce above nutrients values remarkably. A Statistical significance of nutritional advantage in traditional rice was seen in all except glycemic index and fibre content. Meanwhile, the Selenium levels were available only as a mean value from secondary data and therefore couldn't compute the statistical significance. (5),(6),(7),(8),(9),(10),(11),(12),(13),(14),(15),(16),(17).

Discussion

Benefits of consuming low glycemic index foods are: reducing LDL, weight, body fat and lowering the risk of developing metabolic syndrome and cardio vascular disease (18).

The glycemic index is lower in traditional rice. But a significant difference couldn't be identified perhaps due to inadequate number of samples tested. Also the glycemic index is lowered by parboiling (11) . Therefore more attention should be given to consumption of parboiled rice.

Rice, especially its bran contains largely insoluble fiber. Higher content of insoluble fiber slows down gastro intestinal transit time, adsorb water to make fecal bulk and results in satiety and lower glycemic index (18).

The traditional rice have a higher fibre content compared to newly-improved rice, in the only study which had used the identical method to quantify the amount of fibre (7). However this difference was overlapping the 95% confidence interval.

Anti-oxidants scavenge free radicals produced in body tissues. They help in reducing production of harmful oxidized LDL, Lipoprotein (a), Homocystein, abnormal amino acids and nucleic acids. Therefore reduce risk of developing atherosclerosis, auto immune diseases and cancers (19).

Several methods had been used in different studies to assess anti-oxidant properties of rice giving different dimensions of values. In general, all studies showed that traditional rice have a significantly higher level anti-oxidant properties.

Anti-glycation activity prevents production of advanced glycated end products within our body. Glycated cell-membranes, collagen and LDL causes cytokine damage relevant tissues. Therefore, food with high anti glycation activity can reduce diseases like Diabetes, Atherosclerosis, Alzheimer's etc. (14), (20)

Significantly higher levels of anti-glycation activity was detected among traditional rice varieties.

Proteins are needed for growth, development, immunity, recovery/ tissue repair, nutrient digestion/ transport/ storage. In Sri Lankan diet, majority of protein requirement is obtained through rice due to the high percentage in the common Sri Lankan meal (21).

The traditional rice have a significantly higher amount of proteins than newly-improved rice. Therefore, when total amount of rice needs to be restricted, while ensuring adequate protein intake, traditional rice provides an alternative option.

Iron is essential to carry oxygen to all tissues for their survival. Iron deficiency anemia is a public health problem in Sri Lanka. Zinc is required for enzyme reaction as a cofactor, anti-oxidative action, gene expression, immunity etc. It is also found to be important in wound healing, Vitamin A metabolism and developing higher cognitive functions. Selenium is a component of Glutathione peroxidase which is important for anti oxidative action, and also a component of Thyroxine deiodinase.

Both Iron and Zinc levels in traditional rice are significantly higher than newly-improved rice while Selenium values are also higher.

Conclusion

The current available data shows that traditional rice varieties possess a nutritional advantage over the commonly consumed newly-improved rice varieties. Traditional rice varieties have significantly higher content of protein, functional components, iron and zinc, while they also have a lower glycaemic index, higher fibre and Selenium content as well. These nutritional advantages may have contributed to the traditional claims of 'healing properties' of traditional rice varieties.

References

01. Jayawardena R, Thennakoon S, Byrne N, Soares M, Katulanda P, Hills A. Energy and nutrient intakes among Sri Lankan adults. *Int Arch Med* [Internet]. 2014;7(1):34.
02. Ranawake AL, Amarasinghe UGS, Dahanayake N. Assessment of allelopathic potential of some traditional rice cultivars in Sri Lanka. *Int J Sci Res Publ*. 2014;4(7).
03. Jayasumana C, Gajanayake R, Siribaddana S. Importance of Arsenic and pesticides in epidemic chronic kidney disease in Sri Lanka. *BMC Nephrol*. 2014;
04. Jayasumana C, Paranagama P, Fonseka S, Amarasinghe M, Gunatilake S, Siribaddana S. Presence of arsenic in Sri Lankan rice. *Int J Food Contam* [Internet]. 2015;2:1.
05. Properties of some traditional rice varieties of Sri Lanka - ITI. 2011.
06. Abeysekera WKSM, Arachchige SPG, Ratnasooriya WD, Choudhary MI, Dalvandi K, Chandrasekharan NV. Anti-diabetic related health food properties of traditional rice (*Oryza sativa* L.) in Sri Lanka. *J Coast Life Med* [Internet]. 2015;3(10):815–20.
07. Gunaratne A, Wu K, Li D, Bentota A, Corke H, Cai YZ. Antioxidant activity and nutritional quality of traditional red-grained rice varieties containing proanthocyanidins. *Food Chem* [Internet]. 2013;138(2–3):1153–61.
08. Gunaratne A, Bentota A, Cai YZ, Collado L, Corke H. Functional, digestibility, and antioxidant properties of brown and polished rice flour from traditional and new-improved varieties grown

in Sri Lanka. *Starch/Staerke*. 2011;63(8):485–92.

09. Samaranyake MDW, Yathursan S, Abeysekera WKSM, Herath HMT. Nutritional and antioxidant properties of selected traditional rice (*Oryza sativa* L.) varieties of Sri Lanka. *Sri Lankan J Biol [Internet]*. 2017;2(2):25.
10. Hettiarachchi P, Jiffry MTM, Jansz ER, Wickramasinghe AR, Fernando DJS. Glycaemic indices of different varieties of rice grown in Sri Lanka. *Ceylon Med J*. 2001;46(1):11–4.
11. Nisanka TUS, Ekanayake S. Rice variety and processing: contribution to glycaemic response. *Ceylon Med J*. 2016;61(4):159.
12. Jayasekera R, Freitas MC. Concentration levels of major and trace elements in rice from Sri Lanka as determined by the k0 standardization method. *Biol Trace Elem Res*. 2005;103(1):83–96.
13. Gunaratne A, Kao W, Ratnayaka J, Collado L, Corke H. Effect of parboiling on the formation of resistant starch, digestibility and functional properties of rice flour from different varieties grown in Sri Lanka. *J Sci Food Agric*. 2013;93(11):2723–9.
14. Ramkissoon JS, Mahomoodally MF, Ahmed N, Subratty AH. Antioxidant and anti-glycation activities correlates with phenolic composition of tropical medicinal herbs. *Asian Pac J Trop Med*. 2013;6(7):561–9.
15. Herath HMT, Rajapakse D, Wimalasena S, Bandu Weerasooriya MK. Zinc content and prediction of bio-availability of zinc in some locally grown rice (*Oryza sativa* L.) varieties in Sri Lanka. *J Natl Sci Found Sri Lanka*. 2016;44(3):291–9.
16. Diyabalanage S, Navarathna T, Hemalika T, Rajapakse S, Chandrajith R. Trace elements in native and improved paddy rice from different climatic regions of Sri Lanka: implications for public health. *Springerplus*. 2016;5(1):1864.
17. Sompong R, Siebenhandl-Ehn S, Linsberger-Martin G, Berghofer E. Physicochemical and antioxidative properties of red and black rice varieties from Thailand, China and Sri Lanka. *Food Chem [Internet]*. 2011;124(1):132–40.
18. Lattimer JM, Haub MD. Effects of dietary fiber and its components on metabolic health. Vol. 2, *Nutrients*. 2010. p. 1266–89.
19. Atoui AK, Mansouri A, Boskou G, Kefalas P. Tea and herbal infusions: Their antioxidant activity and phenolic profile. *Food Chem*. 2005;89(1):27–36.
20. West BJ, Uwaya A, Isami F, Deng S, Nakajima S, Jensen CJ. Antiglycation activity of iridoids and their food sources. *Int J Food Sci*. 2014;2014.
21. Jayawardena R, Byrne NM, Soares MJ, Katulanda P, Hills AP. Food consumption of Sri Lankan adults: An appraisal of serving characteristics. *Public Health Nutr*. 2013;

Symptoms of exocrine pancreatic insufficiency

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Exocrine pancreatic Insufficiency (EPI) is largely a clinical diagnosis.

Depending on the severity of pancreatic insufficiency, symptom may vary

- Loose bowel movements
- Pale, frothy, foul smelling stools (steatorrhea)
- Abdominal discomfort
- Flatulence
- Bloating
- Blood glucose derangements in severe disease
- Weight loss



Steatorrhea is defined as the quantitative appearance of > 7 g of fat per day after consuming or having infused 100 g of fat. But with reasonable suspicion, a positive spot stool test may be adequate to detect steatorrhea.

Fine KD, Schiller LR Gastroenterology. 1999 Jun; 116(6):1464-86.

Pancreatic Enzyme Replacement Therapy (PERT)

PERT replaces digestive enzymes that are deficient. It contains protease, lipases and amylase enzymes. A study done to assess the long-term efficacy of pancreatic lipase (delayed released capsules) has revealed that there is strong evidence for long term safety and tolerability of PERT. Increase in body weight and reduction in stool frequency and improvement of clinical symptoms are observed. (Keller and Layer 2005)

The dose which is required to treat steatorrhea should contain concentration of enzymes around 10% of what the pancreas would normally produce and achieve maximum efficacy at PH of 7 to 8. Enteric coated preparations resist degradation by gastric acid.

Factors affecting the efficacy of PERT

- Compliance
- Dosing of enzymes
- Timing of enzymes
Enzyme should be taken with meals, no more than 30 minutes prior to eating for maximum efficacy Need to give with snacks as well
- Acidic gastric environment
Enteric coated tablet protects the digestive enzymes. It is not dissolved until PH approaches to 6 Proton pump inhibitors, H2 blockers, bicarbonate tablets help to raise the PH of gastric secretions and increase efficacy of the drug.
- Slow gastric emptying
Consider prokinetic drug if appropriate
- Exposure to heat
Enzymes stored in hot environment may lose efficacy

Dosing of pancreatic enzyme replacement therapy

Dosing is adjusted based on the amount of lipase in the supplements, and the initial dose aims at supplying 40 to 60 IU/minute of lipase activity within the duodenal lumen. To achieve this goal in adults, approximately 25,000 to 40,000 IU of lipase is required to digest a typical meal, and about 5000 to 25,000 IU of lipase per snack. However, is not recommended to exceed 10,000 IU of lipase per kg of body weight per meal. Assessing the lipase per unit per gram is useful in situations where per kg enzyme dose is higher than recommendations. 1000- 4000 U lipase/ 1 g dietary fat per day at meals and snacks is recommended by ASPEN guidelines.

Enteric coated capsules can be swallowed without crushing or chewing. Non-enteric coated preparations should be given with an acid reducing agent such as proton pump inhibitors or H2 blocker to avoid degradation by gastric acid

Pancreatic enzyme supplementation for patients receiving enteral nutrition

Gastrically placed tubes involves opening the capsules and suspending the enzyme microspheres in thickened acidic fluid (such as the mildly thickened or "nectar-thick" fruit juice used for dysphagia) for delivery into the feeding tube. This technique minimizes tube blockage by preventing the enzyme from clumping in the tube.

For jejunally placed tubes, enzyme microspheres can be crushed and activated with sodium bicarbonate before flushing into the tube, or the activated enzyme mixture can be added to enteral feeds.

Points to remember

- (1) Titrate the dose of PERT to the presumptive degree of pancreatic insufficiency.
- (2) Administer PERT with the first bite of a meal and consider adding extra enzymes during or towards the end of the meal
- (3) Consider using microspheres, possibly adding a rapid release enzyme preparation and/or acid-blockade,
- (4) Adjusting the dose to the fat content of the meal.

Safety and side effects

Supplemental enzymes act within the lumen of the intestine, and this is considered an intraluminal and not a systemic therapy. The most commonly reported side effects for recently approved enzymes are headache (6%), dizziness (6%), abdominal pain (9%), and flatulence which are self limiting.



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