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MESSAGE FROM EDITORS

Dear Members,

As we draw close to the end of year 2020, a time in which all of us had to rapidly adopt to a global pandemic, changing our way of living; it has brought us all close together and made us cherish the more important things in our lives. Maintaining our health and fitness has taken center stage in fighting this pandemic.

We are pleased to announce that this newsletter features contributions from many of our junior members. We warmly welcome any contributions from our readers and please forward your articles and suggestions to slmna2015@gmail.com.

On behalf of SLMNA, we would like to wish all our readers a happy and healthy new year!

Co - editors

Thilini & Chameera

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01. Capture of the month

“Hard times create strong men, strong men create good times, good times create weak men, and weak men create hard times.”

G. Michael Hopf



02. “Kollu” (Horse gram)

An underutilized, Nutritious Legume

Dr. Melani Karunathilake

Nutritional value and health benefits of Horse Gram

“Kollu” also known as “Horse Gram” is a type of legume which is most commonly utilized in Asian, African countries and Australia. Horse gram (*Macrotyloma uniflorum*; earlier known as *Dolichos uniflorus*); belongs to family *Fabaceae*, and it is one of the lesser popular legumes in the world. It was initially used as horse feed and came in to human consumption much later once its nutritional values and health benefits were discovered.

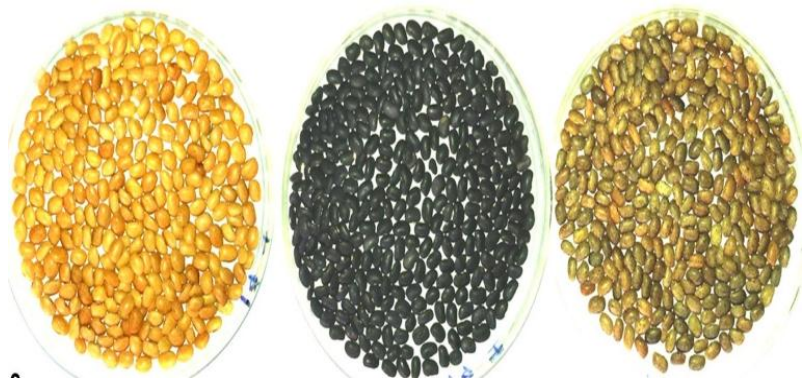


It is mainly cultivated in Asian and African countries. It is able to survive in high temperate and subtropical regions of the world such as African countries (Sudan, Zaire, Angola, Zimbabwe and Tanzania) and Asian countries (Bhutan, China, India, Nepal, Pakistan, Sri Lanka, Malaysia and Mauritius). Its crop zones are also found in

Australia even under low soil fertility statuses. It is usually cultivated as an under-crop or as a mixed crop with other cereals like maize.

There are different names for horse gram in various parts of the world.

- Sinhala/ Tamil – “Kollu”
- Hindi – “Kulthi”
- Sanskrit – “Kulattha”
- Bengali – “Kurti-kalai”
- Telgu – “Ullavallu”
- Malyalam – “Muthira”
- Kumaon and Garhwal – “Gahot”



Horse gram seed; the edible part, is a flattened, shiny seed which can be seen with brown, red, black, grey or mottled outer covers. It contains a relatively higher amount of protein compared to other legumes where it has 23% (18–29%) protein, 57.2% (60–70%) carbohydrates, 1% fat, 3.2% minerals (287 mg/100 g calcium, 8.4 mg/100 g iron and 311mg/100 g phosphorus), vitamins (0.42 mg/100g thiamine, 0.2mg/100g riboflavin, 1.5mg/100g niacin and 1.0mg/100g vitamin C) and 5.3% crude fiber.

The ethanol extract of horse gram seed has shown remarkable antioxidant activity; free radical scavenging against nitric oxide free radicals. Methanol extract of horse gram seed has shown scavenging effect of 4 times greater than that of the synthetic antioxidants like ascorbic acid. These antioxidants found in horse gram have shown protective effects against intestinal diseases, diabetes, coronary heart disease, dental caries etc. Various bioactive compounds seen in this legume such as phytic acid, phenolic acid, fiber, enzymatic/proteinase inhibitors are known to reduce the risk of various disease occurrences, and in addition have hepato-protective and diuretic effects.

The anti-diabetic property of horse gram has been investigated widely and concluded to be due to phyto-constituents like flavonoids, terpenoids, saponins, carotenoids, alkaloids and glycosides. Myricetin (Myr) (35 $\mu\text{g/g}$ flour); a major flavonol in horse gram seed coat is now known to exert anti-diabetic, anti- obesity, anti- inflammatory and anti-cancer effects as well as effects against urinary stone formation and neurological diseases like Parkinson's and Alzheimer's. The extracts taken from horse gram seeds have also shown effects against *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* due to its anti-inflammatory property.

Horse gram is known to reduce constipation by establishing normal lower intestinal function, due to its high insoluble fiber content. The soluble fiber component is known to decrease serum cholesterol levels, reduce risk of myocardial infarctions and colonic cancers as well.

Nutritional information		ANK - Black	ANK – Brown
1	Moisture (%)	11.7 ± 0.17	11.8 ± 0.86
2	Composition (% by dry weight)		
	<i>Protein</i>	22.0 ± 0.37	24.2 ± 0.25
	<i>Fat</i>	0.9 ± 0.12	0.8 ± 0.02
	<i>Crude fiber</i>	6.9 ± 0.17	6.7 ± 0.20
	<i>Ash</i>	3.6 ± 0.02	3.6 ± 0.09
	<i>Carbohydrate</i>	66.8	64.6
3	Mineral content (mg/kg)		
	<i>Iron</i>	104 ± 1.75	115 ± 0.61
	<i>Zinc</i>	30.6 ± 0.81	30.6 ± 0.95
	<i>Calcium</i>	1287 ± 3.00	1572 ± 2.00
	<i>Potassium</i>	1.0 ± 0.12	1.0 ± 0.21
4	Phosphorus (mg/100g)	361 ± 3.00	369 ± 1.73
5	Phytate content	2.29 ± 0.23	4.01 ± 0.48
6	Total dietary fiber (% by dry weight)	21.1 ± 0.27	21.2 ± 1.30
7	Starch (% by dry weight)		
	<i>Total starch</i>	46.9 ± 1.29	43.1 ± 1.66
	<i>Resistant starch</i>	10.5 ± 0.28	10.5 ± 0.62
	<i>Non-Resistant starch</i>	36.2 ± 1.13	32.7 ± 1.05
8	Predicted GI value(GI=Glycemic	39.8 ± 0.25	39.8 ± 0.64

Adapted from “Important Nutritional Information of Popular Grain Legume Varieties in Sri Lanka” published by Department of Agriculture-ITI, 2016. (ANK- Black= “AgunaKaluKollu”, ANK- “Brown- AgunaDumburuKollu”)



Horse gram has a characteristic taste which is enhanced with various different preparation methods. In Sri Lanka there is this special horse gram curry called “Kolluānama” made with roasted- powdered horse gram added to coconut milk, eaten together with rice or another staple. It is also prepared as kanji, drink and aggala. In India, it is prepared as rasam, soup, chutney and roasted-powder (“Kollu Podi”) is used to make “idli”, “dosa”, “pittu” and various other recipes.

In conclusion, horse gram is an extremely valuable, cheap and an easily cultivated legume that can be specifically utilized for people in underprivileged, rural communities to meet their daily needs of protein and energy.



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03. CURD AND YOGHURT

Dr. Uthpala Hiripitiya

Curd and yoghurt are fermented milk products rich in proteins, vitamins and minerals such as calcium and phosphorous. Curd is made from either cow's milk, buffalo milk or a mixture of both. Curd made from buffalo milk is known as “*Meekiri*” which is rich in fat and set harder than those made from cow's milk which is known as “*Deekiri*”. The fermentation occurs due to lactic acid bacteria which produce an acidic environment. It is a good source of B vitamins such as riboflavin, niacin, vitamins B6 and B12.

Yoghurt is a nutrient dense probiotic food that contains viable, live, non-pathogenic bacteria cultures of *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. Yoghurt is commercially produced in various compositions, such as whole, low-fat and non-fat forms; with added flavors such as strawberry or chocolate, or with added fruits and sometimes with natural and artificial sweeteners. Greek yoghurt is another product, produced by straining the fermented milk after coagulation, which results in removal of liquid whey and some lactose.

Nutritional value of curd and yoghurt

- High in protein and easily digested (as bacterial pre-digestion of milk proteins has already occurred).
- Good source of lactose. The composed lactose is converted to lactic acid and therefore it is well tolerated in lactose intolerance.
- Excellent source of calcium and phosphorous which are easily absorbable in its ionic form at low pH.
- They are a good source of vitamins (Riboflavin, Niacin, Vitamin B6 and Vitamin B12 and folate).
- They are a rich source of probiotics which is beneficial for improvement of gut microbiome and thus has protective role in many infectious and immune mediated gut diseases.

Different preparations of curd and yoghurt around the world

Different preparations of curd and yoghurt are found around the world. The way they are incorporated into the diet is different. These are a few varieties which are used in different countries.



Meekiri/yoghurt in Sri Lanka



Chekide/Kefir yoghurt/lassi in Iran



Matsoni in Russia



Cacik in Serbia and Turkey



Juju dhau in Nepal



Dhai in India



Suzme yoghurt Turkey

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04. Multi Vitamin Syrups for Children under 5 years

Are they Safe?

Dr. R. Chapa Roshini Wijesena



Micronutrient deficiency has become a major public health problem in Sri Lanka. The main reason for these deficiencies is limited access to micronutrient rich foods such as fruits, vegetables, animal source foods, and fortified foods, mainly due to high cost and local unavailability(2). Low dietary diversity has been reported among children (3). Micronutrient deficiencies increase morbidity and mortality from diarrhea, measles, malaria and pneumonia and in younger children especially it can contribute to impaired physical and mental development (2).

Supplementation and food fortification are the most commonly used nationwide strategies to alleviate micronutrient deficiencies in our country. Among them, salt iodization and vitamin A supplementation have proven to be successful (8–12). But coexistent multiple micronutrient deficiency is considered as a major public health issue, affecting more than 50% of children and adolescents in Sri Lanka (13).

Following studies show the prevalence of major micronutrient deficiencies in under 5 year old children in Sri Lanka.

Table 1: Prevalence of major micronutrient deficiencies under 5 years of children in Sri Lanka

Micronutrient	Study population	Study Area	Results	Source/Study
Iron	Children aged 6–59 months	National survey(25 districts in Sri Lanka)	Iron Deficiency(ID)-33.6% (SF<12 µg/dL) Iron Deficiency Anaemia-7.4% (SF < 12 µg/dL with low Hb <11 g/dL)	Jayatissa et al., 2014 NNMS [4]
	Infants aged 6–6.5 months	Colombo Municipal Council Area	ID-37.2% (SF<12 µg/dL)	Wickramasinghe et al., 2017 [5]
Vitamin A	Infants aged 6–6.5 months	Colombo Municipal Council Area	Vit A deficiency(VAD)-1.1% (Serum retinol < 20 µg/dL)	Wickramasinghe et al., 2017 [5]
	Pre-school children aged 2–5 years	Ragama MOH area	VAD-38.2% (serum vitamin A < 20 µg/dL)	Marasinghe et al., 2015 [6]
Iodine	Pre-school children aged 3–5 years	Galle district	Median free T4 concentration for Serum free T4 F—15.08 pmol/L M—14.83 pmol/L	Hettiarachchi and Liyanage, 2012 [7]
Zinc	Children aged 6–59 months	National survey(25 districts in Sri Lanka)	Zinc deficiency-5.1% (serum zinc concentrations-<65 µg/dL in the morning and <57 µg/dL in the afternoon)	Jayatissa et al., 2014 NNMS [4]
	Pre-school children aged 2–5 years	Ragama MOH area	Zinc deficiency -66.7% (serum zinc concentrations <9.9 µmol/L)	Marasinghe et al., 2015[6]
Calcium	Children aged 6–59 months	National survey(25 districts in Sri Lanka)	Calcium deficiency-47.6 % (Serum calcium<8.4 mg/dL)	Jayatissa et al., 2014 NNMS [4]

Following table give the recommended daily intake (RDI) of multivitamins (14) and minerals in children < 5 years in Sri Lanka.

Table 2: Recommended Daily Nutrient Intake (MRI-2007 data) (14)

Recommended Daily Nutrient Intake (sources-MRI 2007)															
	A ^{***}	B1	B2	B3	B6	B9	B12	B5	C	D3	E	Zn	Ca	Fe	***Vitamin A 1 IU=0.3 mcg retinol
	mcg(RE)	mg	mg	mg	mg	mcg	mcg	mg	mg	mcg	g(alfaT)	mg	mg	mg	Vit A(IU)
0-6 months	375	0.2	0.3	2	0.1	80	0.4	1.7	25	5	2.7	3	300	0	1250
7-11 months	400	0.3	0.4	4	0.3	80	0.5	1.8	30	5	2.7	4	450	17-19	1333.3
1-3 years	400	0.5	0.5	6	0.5	150	0.9	2	30	5	2.7	4	500	9	1333.3
4-5 years	450	0.6	0.6	8	0.6	200	1.2	3	30	5	2.7	5	550	12	1500

The composition of commonly available MVT syrups is depicted in table 3.

According to these tables, the recommended dosage of most of the vitamins and minerals prescribed in the MVT syrups are above the RDI. In the patient information leaflet given with the syrup, the manufacturer states that “appropriate overage of vitamins added compensates for the loss on storage”. But there is no method to calculate how much of vitamins lost at the time of purchasing. Unfortunately, in Sri Lanka, there are no regulations for MVT syrups and almost all the pharmacies and supermarket pharmacies issue MVT syrups on patient’s request without a medical prescription. This can lead to vitamin toxicity in the long run.



Many general practitioners use MVT supplements in children to increase appetite and gain weight even without any deficiency features. But it is recommended to prescribe vitamins for those who are either deficient or RDI for those with reduced oral intake. With the prescription, education regarding the importance

of a nutritionally balanced diet and how to improve the current diet should be discussed with caregivers. It is important to emphasize the duration for which the MVT syrup should be used.

Mega-doses of vitamins and minerals can be toxic and some vitamins and minerals can interact with medications that the child may take. Because water-soluble vitamins are not stored but rather excreted through urine, they are less likely to cause toxicity even when taken in high doses (25).



**Table 3: Composition of commercially available MVT syrups in Sri Lanka
(Source: Patient Information Leaflet of MVT syrups)**

Mineral	A	B1	B2	B3	B6	B9	B12	B5*	C	D3	E	ZnSO ₄	Lysine	Recommended dosage in patient's leaflet	Price	Other ingredients
Syrup/Unit	IU	mg	mg	mg	mg	mcg	mcg	mg	mg	IU	mg	mg	mg		LKR	
Asp-syrup-5ml	2500	2	1	2.5	1	0	1	2.5	50	200	0	0	0	0 Children 5ml/day	240	
Asp-D-0.6ml	3000	2	1	10	1	0	0	3	40	400	5	0	0	Infants 0.3ml/day	140	
Asp-syrup-5ml	800	0.75	0.75	7.5	0.5	0	0.5	0.5	0	100	2.5	22.2	0	0.5ml twice a day	432	KI-50mcg, CuSO ₄ -100mcg
Asp-D-1ml	2500	1	1	10	0.5	0	0	1	40	200	2.5	13.3	0	0.4 year 1ml/day	225	
Asp-B-5ml	0	0.75	0.75	7.5	0.5	0	0.5	0.5	0	200	2.5	22	100	0.5ml twice daily	558	CuSO ₄ -100mcg, KI-50mcg, Se (Elemental) 30mcg
Asp-gold-syrup-5ml	0	1.4	1.8	18	2	400	4	6	60	200	10	0	200	1-12 years 5ml/day	350	Calcium lactate-10mg, Biotin 150mcg
Asp-syrup-5ml	0	1.2	1.3	16	1.3	400	2.4	5	50	200	5	27.6	0	0.1-6 years-2.5ml/day**	250	Omega 3-1.6mg, Biotin 25mcg
Asp-ertone-syrup-5ml	500	2.2	1	20	2	0	3	10	30	400	2.5	6	200	Upto 2 years-5ml twice daily	630	Calcium lactate-10mg
Asp-syrup-10ml	0	10	0	20	1.5	0	7.5	5	30	0	0	20	200	2 years and adults-10ml twice daily	550	
Asp-syrup-10ml	0	3	3.5	25	1	0	5	2	50	400	1	16.5	200	2 years and adults-5ml twice daily	473	
Asp-syrup-5ml	1330	0.9	0.9	10	0.9	0	1.5	0	0	200	6	0	25	2 years-5ml once daily	690	Taurine 2.5mg, Choline 30mg
Asp-plex-liquid-5ml	2500	10	1.25	12.5	5	0	50	0	0	200	0	0	12.5	1-3 years 2.5 ml once daily		FeSO ₄ -75mg (Elemental 15mg) Ca3(PO ₄) ₂ -12.5mg
Asp-plex-liquid-5ml	0	0.6	0.9	10	1.1	0	0	0	0	0	0	0	0	4-6 years 2.5-5 ml once daily		Magnesium Gluconate-4mg
Asp-plex-liquid-5ml	0	0.75	0.75	7.5	0.5	0	0.5	0.5	0	100	2.5	22.2	5	Children 1 tsp thrice daily	553	Proteins-1500mg, Ca Lactate-570mg, MgSO ₄ -61.5mg
Asp-plex-liquid-5ml	0	2.5	2.5	12.5	1.5	0.5	7.5	2.5	0	0	0	11	200	5-5ml twice daily	397	CuSO ₄ -100mcg, KI-50mcg
Asp-plex-liquid-5ml	4000	1.4	1.7	18	0.7	0	0	0	35	400	3	0	0	0.1-12 months-2.5ml, 2-3 years-5ml, >4 years-10ml as once daily dose	460	Ca Lactate-10mg, CuSO ₄ -100mg, KI-50mcg
Asp-plex-liquid-5ml	0	2.5	2.5	25	1.5	0	5	0	25	0	0	27.5	200	1-2 tsp twice daily	454	1013 Cod liver oil-200mg
Asp-plex-liquid-5ml	0	0	0	50	1.5	0	7.5	0	0	0	0	44.4	0	0.2-5 years-5ml twice daily	289	Fe Fumarate-155mg (Elemental-50mg)
Asp-plex-liquid-5ml	0	6	3	45	6	0	0	1.8	0	0	0	0	0	As directed by the physician	553	Calcium glycerophosphate-69mg
Asp-plex-liquid-5ml	1667	2	16.7	1	0.5	1.66	0	26.7	133.3	5.1	0	25	2-11 years-5 ml thrice daily	371		
Asp-plex-liquid-5ml	443	0.5	0.8	6	0.5	80	1	2	30	400	5	2.5	0	6 months-4 years-5 ml daily	1950	Iron-4mg, Copper-150mcg, Malt extract-500mg

Syp- syrup D-Drops *B5-As as Dexapanthenol **Contain elemental Zinc 10mg in 5ml



Advice for practitioners who prescribe MVT syrups:

- ✓ Always encourage parents to give balanced nutritious meals to children instead of depending on MVT supplements
- ✓ The main purpose of using MVT syrups should be to treat and prevent deficiency symptoms
- ✓ MVT syrups may be beneficial to improve appetite and gain weight if any vitamin or mineral deficiency is suspected.
- ✓ Duration for taking the MVT syrup should be mentioned clearly and advice parents not to take more than for the prescribed duration
- ✓ Vitamin A mega dose should not be given to children who are on MVT syrups which contain vitamin A.
- ✓ Preterm and low birth weight (LBW) babies are excluded from vitamin A mega dose and MMN supplements during first 2 years of life as they are on iron supplements and MVT drops which contain vitamin A.
- ✓ In Sri Lanka commonly used MVT drops for these LBW and preterm babies are Grovit drops and Zincovit drops. But both these drops do not contain vitamin B₁₂ and folic acid. Folic acid is given separately on weekly basis but not vitamin B₁₂. But an adequate amount of B₁₂ can be supplied to the infant during the exclusive breastfeeding period. Afterwards starting animal source food early during complementary feeding is essential in these babies to minimize iron as well as vitamin B₁₂ deficiency.
- ✓ Zinc containing MVT syrups should be prescribed in acute diarrheal conditions for 10-14 days.



All the MVT syrups in the above list were not known to contain alcohol (some stated clearly as ‘Alcohol-Free’ and in others alcohol was not mentioned). Almost all the syrups had ‘flavoured syrup-based q.s.’ as the flavoring agent and sugar/sorbitol to make them sweet.

The safety of using MVT syrups depends on the patient’s health status, amount of syrup used and the duration of usage. If MVT syrups are prescribed based on these facts commercially available MVT syrups can be used without any adverse outcomes in children.

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05. Picky eating in adults

Dr K. L. Ayomi Jayathilake



What is picky eating?

Picky eating is avoidance or rejection of food resulting in the consumption of an inadequate variety of foods. Restriction of food is based on the type or variety of food and the way their food is served. There can be eating inflexibility, eating from a short-range of foods, food neophobia and food disgust. Picky eaters avoid many new and familiar foods because of their taste, smell, texture or appearance.

A severe disordered form can be manifested as Avoidant/Restrictive Food Intake Disorder (ARFID).

Picky eating is different to Avoidant/Restrictive Food Intake Disorder (ARFID). Picky eating is considered to have a psychosocial impairment to a small degree, even though it is not considered disordered eating.

How is a food choice made?

Food intake behavior is primarily controlled by the brain. Brain interconnects the internal factors and the food behavior traits with the external food-related behavioral factors. All the senses are involved in regulation of food intake. Food intake is finally decided by a person based on the following; whether it is a reward, a practice of self-control, impulsivity and learning through previous experience.

What is food neophobia?

Food neophobia is the overwhelming fear of new or unfamiliar food. It leads the person to be picky about what he/she may eat. This can lead to malnutrition; defective social functioning and psychological difficulties. Among subjects, higher intakes of mono-unsaturated fatty acids, fibre and protein and lower levels of carbohydrates, saturated fat and salt intakes have been observed.

Food Disgust

This is another reaction of people in relation to food restriction behaviour. This can be triggered by sensitivity to the experience



of a certain odour, taste, texture or visual stimuli. There is a possible subsequent emotional reaction which can lead to the disgust over a food.

Adults with picky eating behaviour, who has higher levels of disgust sensitivity, are more likely to avoid food that is mixed or “lumpy”. They may have more intense taste responses than non-picky adults. This mediates the picky eating and anxiety.

What is Avoidant/Restrictive Food Intake Disorder (ARFID)?

According to the DSM-5 diagnosis, ARFID is characterised by the restriction of food based on lack of interest in food, the sensory characteristics of food or an aversive experience with food, leading to failure of maintaining the energy or nutritional needs manifested by either;

1. Clinically significant weight loss (or poor growth in children)
2. Nutrition deficiency
3. Depending on supplementary feeding
4. Impaired psychosocial functioning or
5. Combination of the above.

This is not related to the lack of availability of food or other food intake behaviours governed by the cultural aspects. Low BMI and bone mineral density are often identified in these patients. The prevalence of this disorder is not well known. Generalised anxiety disorder has been recognised to have an association with ARFID. Food disgust mediates anxiety and ARFID fully.

Picky eating in adults

Learned behaviours associated with food intake during childhood, adolescence or even adulthood can be the cause for selective eating patterns in adults. Several other factors may lead to food selectivity including food restriction following certain nutritional interventions, dietary restriction of a family member, long-term medical problems and restriction of food following drug/allergic reactions.

Some adults with this behaviour are found to have Obsessive Compulsive Behaviour (OCD) to some extent. Generalised anxiety has found to be an association as well. Certain personality factors or an anankastic personality can be the cause for selective eating behaviours such as food neophobia.

Deep rooted beliefs set during childhood can lead to selective eating patterns associated with personality disorders. The variety of food taken is limited. The attitudes and behavioural aspects should be addressed when managing or guiding people with selective eating behaviour.

Outcomes of adult picky eating behaviour

The evidence on nutritional impact of selective eating behaviours is very low. Picky eating has become a perceived barrier to healthy eating, as a cause for lack of vegetable and fruit intake. However, subclinical pickiness is reflected as a stable eating pattern.

Studies have shown that adult picky eaters can have a higher weight, due to lack of fruits and vegetable intake, which can offer protection against chronic diseases; while other studies have shown that it is not associated with high BMI in adults. There is a greater possibility of developing micronutrient deficiencies. Picky eaters fail to enjoy eating and it can interfere with social functioning. It can give rise to conflicts in day-to-day functions, relationships and expectations.

Management of adult picky eating

The clinical and social significance of the identification of adults with selective food intake behaviours can be based on prevention of non-communicable diseases, improving micronutrient and antioxidant intake levels, support needed to achieve enjoyment in life through food intake and effect on family.

Management strategies depend on other disease conditions, severity of the selectivity, cause/architecture of selectivity, expectations, attitudes and effect on family. The patient's willingness to change should be taken into consideration unless there is an underlying psychiatric issue. Then risks and benefits should be assessed first. If the patient doesn't have significant health or social impairment and/or doesn't cause considerable problem to his/her family, dietary counselling to explain the importance of a balanced meal would be adequate.

Case formulation is necessary to identify the etiological background and the pattern of food restriction. The management strategies should focus on both the primary cause for the food selectivity and the associated co-morbidities. Somatic treatments are not usually recommended unless a nutritional deficiency or an associated co-morbidity is present. Patients with an underlying anankastic personality disorders can be difficult to manage.

Management includes a multidisciplinary approach with psychiatrists/psychologists and clinical nutritionists. Psychiatrists have a role in identifying a root cause for the selective food intake. The role of nutrition expert is to provide dietary counselling including the explanation of the importance and components of healthy eating. They can also help to develop the plan provided by the psychological experts and assess whether the patient is nutritionally deficient.

In the management of food neophobia, relaxation training to control emotions and cognitive restructuring can be used. Exposure and response direction can be done.

Interventions are started by eliciting the negative cognition. Then exposure to selective food can be done. It can include eating the food alone or in the presence of the therapist/nutritionist, preparation/assist preparation of the food. A hierarchy of feared food can be of help for desensitisation training using an image or cognitive restructuring during cognitive behavioural

therapy. Gradual exposure approach is ideal. The patient should be always comfortable when deciding to go to the next step. Repeated exposure is carried out until the feared food is accepted.

Patient can be assigned tasks during management such as recording in a diary regarding experience and extent of achievements of trying food he/she dislikes. It would be helpful to recognise the success of interventions and experiences and share them during counselling sessions.

If this affects the family of the patient, we can advise the patient to have an alternative only for him/herself. However, dietary counselling should be done appropriately to guide the patient to select healthy choices and avoid the potential vitamin/mineral deficiencies.

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06. Improving iron bioavailability at household level

Dr.H.P.Wickramasuriya

Iron deficiency and iron deficiency anaemia (IDA) are major health problems in Sri Lanka. Iron deficiency can be identified in all age groups especially in infants, adolescents and pregnant mothers in whom there is an increased physiological need for iron. Iron deficiency results in cognitive impairment in children. It also reduces scholastic performance and causes pregnancy complications. IDA can be caused by low dietary intake of iron containing foods, poor bioavailability of iron in foods, worm infections and other chronic disease conditions.

Bioavailability of micronutrients, particularly non haem iron, is low from plant foods, being influenced by various dietary components, which include both inhibitors and enhancers of their absorption. The combination of various food ingredients as well as the culinary practices may thus have a significant influence on the bioavailability of micronutrients from plant-based diets.

There are several iron absorption enhancers and inhibitors. Non-haem iron absorption enhancers are protein in fish and meat, β carotene, citric acid, ascorbic acid, tartaric acid and malic acid. Citric acid is found in citrus food (eg. lime). Malic acid comes from deciduous fruits such as plums, peaches and apples. Tartaric acid is available in tamarinds and grapes. So adding lime juice into the plant based diet (eg. “Gotukola” salad) improves iron bioavailability of “Gotukola”.



Peptides that contain Cysteine, which are in fish or meat keep iron in soluble form and improve iron bioavailability. Combining fish with other curries such as “Thampala” will increase bioavailability of iron from plant food.

The non haem iron absorption inhibitors are phytates, tannates, oxalic acid and polyphenols. Phytic acid is found in plant foods and its content can be reduced by several methods such as thermal processing, mechanical processing, germination, fermentation and soaking.

Food processing by heat improves the digestibility of macronutrients such as carbohydrates and proteins, by softening and loosening the food matrix. Digestive enzymes can then easily access the nutrients. Softening of the food matrix also releases the protein-bound iron, and facilitates iron absorption. Heat processing is also likely to alter the inherent factors that inhibit mineral absorption such as phytate and soluble dietary fiber, and improving the bioavailability of iron.

Pounding is used to remove the bran and/or germ from cereals, which also reduce their phytate content. Hence, iron bioavailability is increased.

Soaking of grains (eg. green grams in water) causes passive diffusion of phytate. Then it can be removed by decanting of water.



Germination (eg. green gram) increases endogenous phytase activity and degradation of phytate will improve bioavailability of iron.

Fermentation (eg. rice) can induce phytate hydrolysis via the action of microbial phytase enzymes. These enzymes hydrolyze phytate to lower inositol phosphates. Such hydrolysis is important because myoinositol phosphates with 5 phosphate groups (eg. IP-1 to IP-4) and those with 3 phosphate groups do not inhibit non-haem iron absorption.

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07. An Overview on Commercial meal replacements

Dr. H. N. S. Ranatunga



The mainstay of management of overweight and obesity is reduction of energy intake and increasing energy expenditure to achieve negative energy balance. There are numerous strategies for overweight and obese adults to achieve weight loss. One of simple and effective method is to use commercial meal replacements (CMR).

A CMR is a commercially prepared food product. It is ready-to-use and is taken as a replacement for a main meal. It is usually fortified and adequate macro and micronutrients required meal. They come in the form of bars, soups, shakes/drinks, and have about 200 to 400 serving. They are usually used to replace meals per day with the third meal being a conventional healthy meal, so that the person can have a low calorie diet (LCD). Some CMR can be used to replace all 3 main meals to provide a very low calorie diet (VLCD). CMR are not considered as drugs since they do not contain any pharmacologically active ingredients.

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Indications

Indicated in patients with obesity, with or without associated co-morbidities including type 2 diabetes, hypertension, osteoarthritis, polycystic ovarian syndrome. They can be used in Type 1 DM too without the risk of keto-acidosis, as long as there is a sufficient supply of insulin.

CMRs may be indicated prior to surgeries requiring weight loss such as total knee arthroplasty (to reduce the risks peri-operative and to aid in post-operative mobilization) and bariatric surgery (to reduce the liver volume).

In addition, other indications may include a high waist circumference, need for rapid weight loss and unsuccessful attempts at weight reduction using other methods.

Contraindications

There are no absolute contraindications for using a CMR. Yet, precautions must be taken when using CMR in adults more than 65 years of age, if there's a history of psychological disturbances, alcohol or drug abuse, cholelithiasis, pancreatitis, electrolyte disturbances, if experiencing menstrual cycle irregularities, women with fertility problems and if using a diaphragm as a contraceptive (it could become loose with weight loss).

If on treatment for Type 1 and Type 2 DM, hypertension, dyslipidaemia or those on lithium therapy may need a reduction in dosage of their drugs with weight loss.

Advantages

It is easy to use and available in fixed portion. It gives the accurate amount of calories and nutrients compared to home-made meal. They are nutritionally complete, which means that it contains the adequate amount of protein and micronutrients needed per meal. Fixed reduction in calorie amount ensures weight loss and weight maintenance, which gives motivation to the patient psychologically also. Narrowing food choices is also an effective way to lose weight.





Disadvantages

The taste may not be suitable for some individuals and may not be feasible to use in social situations. They also may not provide the satisfaction that conventional meals do, and may not satisfy the hunger either.

Adverse effects

During first few days, the patients may experience fatigue, hunger, lack of concentration, nausea and headaches due to the major dietary adjustment.

There are less adverse effects have been reported with partial meal replacement therapy compared to VLCD. Due to the absence or low amount of bulk forming fiber in some MR, constipation might be a problem. But most products available now have soluble and insoluble fiber added.

There are effects that are not directly due to MR, but due to effects related to a negative energy balance due to VLCD. The side effects are generally due to the ketosis and rapid weight loss. Some effects include a dry mouth and skin, halitosis, headache, dizziness, fatigue, tiredness, irritability, menstrual irregularities, cold intolerance, hair loss, diarrhea and postural hypotension. With prolonged use there have been a few cases of acute psychosis and exacerbations of gout. Cholelithiasis was another problem that has been reported. The National Institute of Health, UK, recommends an extra 10g of fat to stimulate the gallbladder to contract and prevent the stasis of bile that causes stone formation.

Conclusion



In conclusion, using CMRs are an effective method to lose weight, especially in a short time period, and they may be more effective and easy to use than natural food. Also, since these products are nutritionally complete, there is lower chance of getting micronutrient deficiencies, compared to natural food with the same amount of calories.

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08. Past events since last publication

The main event of the SLMNA

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