

**NUTRIENTS THAT WORK
BETTER TOGETHER**

- Certain nutrients need to be taken with other nutrient for increased absorption
- The body's Nutritional status of a particular nutrient also helps in increased / decreased absorption of certain other nutrients
- This knowledge can help us to pair foods rich in certain nutrients for better absorption and utilization



Calcium Interactions

- **Vit D** helps in absorption of Calcium from intestine
- Adequate levels of magnesium in the body are essential for the absorption and metabolism of vitamin D and calcium
- **Magnesium** converts vitamin D into its active form so that it can help calcium absorption
- Magnesium keeps calcium dissolved in the blood, and without magnesium, calcium deposits are left in the kidneys (kidney stones), arteries and joints
- Magnesium stimulates hormone, calcitonin, which helps to preserve bone structure and draws calcium out of the blood and soft tissues back into the bones

Groups at Risk of Deficiency

- Postmenopausal women- decrease in estrogen production, increases bone resorption and decreases calcium absorption
- Lactose intolerant
- Vegans

Sources of Calcium

Milk, yogurt, cheese, tofu, sesame seeds, almond, quinoa, broccoli,

Sources of Vit D

Egg yolks, mushroom, tofu, cheese, milk, curd, soymilk, Salmon, sardines, canned light tuna, herring, mackerel,

Sources of Magnesium

Whole wheat flour, Brown rice, Spinach, white chana, quinoa, whole moong peanut, pumpkin seeds, sunflower seeds, chia seeds, flax seeds almond, cashew

Food Pairing

**Whole wheat paneer / spinach & cheese / mushroom cheese sandwich
dhania pudina chutney with roasted peanuts**

Broccoli – cheese omelette

Broccoli soup with almonds

Vegetable frittata with eggs, spinach, mushrooms, milk and cheese

Yogurt, almond and dried figs smoothie

Stir fried tofu with vegetables and seeds

Quinoa and mushroom

Calcium from Supplement

- **Types**

- **Calcium carbonate** - to be taken with food.

- **Calcium citrate** – can be taken with or without food

- **Don't take more than 500 mg calcium at a time**

- **Avoid taking calcium and iron supplement at the same time**

IRON

Types

Haem Iron

Animal Source
Beef, Pork,
chicken, Fish,
Shellfish

Well
absorbed

Non- haem Iron

Plant source – Cereals, Pulses,
Green leafy vegetables, seeds

Not Well
absorbed in
body

Vitamin C in the
same meal
increases iron
absorption 2-3
times

Non Haem Iron Sources

Cereals - Bajra, jowar, ragi, wheat germ, oats, quinoa

Legumes - Roasted Bengal gram, Chickpea, lobia, moth , masoor, rajmah,

GLV- mint, mustard, spinach

Nuts & seeds -Pistachio, almonds
pumpkin , sunflower seeds, chia , sesame seeds,

Dried fruits - dried apricots, dates

Others -Jaggery, amchur powder

Vitamin C rich foods

Fruits -Citrus fruits, amla, guava, lemon, kiwi, oranges, papaya, strawberries, pineapple

Vegetables - capsicum, bell peppers, broccoli, green chillies, tomatoes, Cauliflower, cabbage

Food Pairing

Bajra Roti with green chutney,

Chana salad with sliced bell peppers and lemon juice

Spinach & lettuce salad with pineapple , tomatoes, and bell pepper

Red and yellow bell pepper stuffed with quinoa

Stir fried broccoli & bell pepper

Spinach saag/ sarsons saag cooked with tomatoes and green chillies

Amla – best source of Vit C

100 gm fresh amla – 625 mg vit C

Vit C in amla retained after heating and drying

Uses:

- Fresh amla juice
- Amla pickles
- Amla in chutney
- Dry amla powder

Iron Supplements

- Take empty stomach or with orange Juice or lemonade
- At least 2 hr gap between iron supplement and calcium supplement / antacids /tea/ coffee/milk



Beta - carotene

- Dietary source of pro vitamin A that selectively converts to Vitamin A
- Antioxidant

Beta – carotene Interactions

- Maximum benefit from beta-carotene-rich foods by addition of small amount of fat
- Addition of milk brings significant increase in the bio accessibility of beta-carotene in
 - Mango - 12 to 56%
 - Papaya – 19 to 38 %
- Increase in bio availability of beta carotene in pumpkin by adding amchur / lime juice while pressure cooking

Effect of Cooking

Method

- Deep-fried sweet potatoes had the most available beta-carotene, followed by steamed or boiled sweet potatoes and then baked sweet potatoes.

Cooking Time

- Boiling carrots for 15 minutes or less increases the amount of the most easily absorbed type of beta-carotene, but cooking them for longer may cause it to turn into a form that isn't as easily absorbed

Foods rich in B- carotene

Sweet potato, carrots, pumpkin, mango, spinach, fenugreek leaves, lettuce, mint, papaya Coriander

Foods rich in healthy fats

olive oil, avocados, coconut, almonds, peanuts, walnuts, cashews, sunflower, chia, and pumpkin seeds

Food Pairing

Mango, papaya shake with chia seeds

Steamed Carrot, Walnut, Raisin and sunflower seed salad

Spinach, Lettuce and tomato salad with egg /olive oil dressing

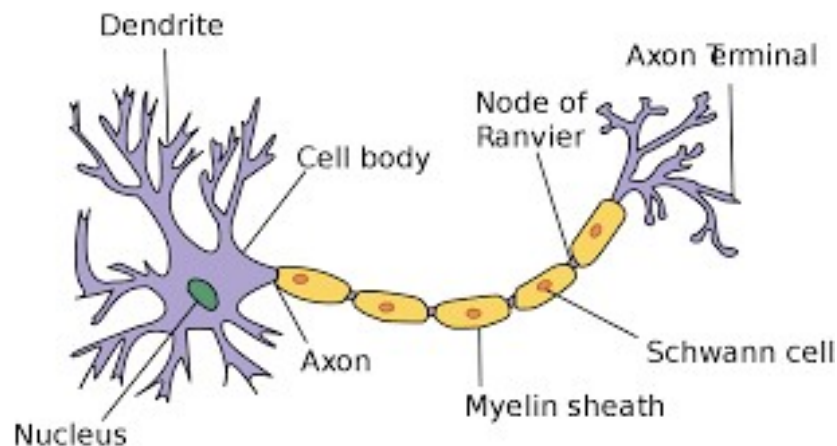
Steamed Carrot sticks with peanut butter / tahini

Boiled sweet potato with walnut and sunflower seeds

Dhania , pudina chutney with peanuts/ coconut



Function



Preservation of the Myelin sheath around nerve cell

Synthesis of neurotransmitters

Deficiency

**Numbness or tingling,
muscle weakness,
peripheral neuropathy**

**Depression, memory loss,
reduced ability to recall**

Function



Vit B-12 + Folic Acid



RBC generation in Bone Marrow

Deficiency



Reduced RBC count
Large, immature and dysfunctional
RBC (Megaloblastic anaemia)

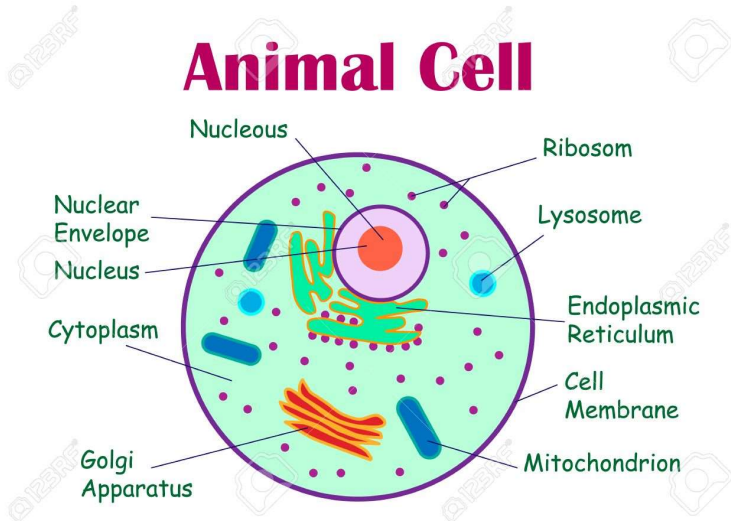
**Sufficient levels of Certain
Nutrients help in Vit B-12
Absorption**

Calcium

In small intestine --- Vit B-12 requires Calcium + Intrinsic Factor produced in stomach, for its absorption

- **Blood levels of calcium in the body should be sufficient**
- **Deficiency of calcium in the body hampers Vit B-12 absorption**

Biotin & Magnesium



In Cell Mitochondria
Vit B-12 + Mg + Biotin



Cellular Respiration
(Energy Production)

Deficiency

Weakness, Fatigue

- Adequate blood levels of biotin and magnesium required for energy production

Groups at Risk for Deficiency

- Metformin for PCOD, Diabetes lowers Calcium levels in intestine which can lead to Vit B-12 deficiency
- Older adults – reduced secretion of stomach acid
- Strict vegans
- Infants breastfed by vegan mothers
- Heavy smokers, coffee drinkers, alcoholics
- Those with stomach and small intestine disorders -celiac, crohn's disease
- Those who had surgery of GI tract or bariatric surgery
- Those on certain medications -oral contraceptive pills, ACE inhibitors for high BP, beta blockers, cholesterol reducing drugs, medicine for ulcers, antibiotics to treat bacterial infection, colchicine, an anti inflammatory drug for gout and PASA an anti TB drug

Diagnosis

Serum Vit B-12 levels

(not Reliable, as it measures total Vit B-12 & not active Vit B12. If a significant amount of vit B12 in your blood is inactive, a blood test may show that you have normal B12 levels, even though your body cannot use much of it.)

↑ Methylmalonic
acid in urine /serum
(MMA) ↓
Only B-12 deficiency

↑ Serum Homocysteine
↓
Both B-12 & Folic Acid deficiency

- Increase in both MMA and homocysteine levels indicate early or mild B12 deficiency
- Increase in only homocysteine level and not MMA indicates folate deficiency.
- Normal MMA and homocysteine levels indicate normal B12 levels.

NATURAL SOURCES OF



EGGS



SALMON



MILK AND DAIRY PRODUCTS



SHIITAKE MUSHROOMS



CLAMS



MUTTON AND CHICKEN

Nutrient	RDA	Food sources
Vitamin B-12	1 mcg/ day	Dairy Products , Eggs, fish , Meat Plant Sources –button mushrooms, dried shittake mushrooms, nori (in sushi), nutritional yeast
Biotin		Peanut butter, egg yolk, oats, walnut, mushroom, brown rice, sesame, almond, flax seeds, sunflower seeds , atta, peas, spinach , banana
Calcium	600 mg/day	Dairy products , methi leaves, chia seeds, almonds, dry coconut, sunflower seeds , Poppy seed, sesame seeds, moringa
Magnesium	340 mg / day	Whole wheat flour, Spinach , white chana, whole moong, quinoa, peanut, pumpkin seeds, sunflower seeds , chia seeds, flax seeds almond, cashew
Folic acid	200 mcg/ day	Liver (beef) ,Wheat germ, Chickpeas, Pulses , Parsley Spinach mango, Peanuts , Sunflower seeds , oats, quinoa

Vit – B-12

RDA - 1 mcg / day

Foodstuff	Vit b-12 Ug / 100 gm	Amount of foodstuff in 1500 Kcal Veg diet	Total Vit b-12 content in 1500 Kcal Veg diet	Amount of foodstuff in 1500 Kcal Non Veg diet	Total Vit b-12 content (ug) in 1500 Kcal Non Veg diet
Milk	0.14	500 ml	0.7	500 ml	0.7
Curd	0.13	400 gm	0.52	400 gm	0.52
Total			1.22		1.22
Additional foods					
Egg	1.8			1 egg (40 gm)	0.72

Folic acid

RDA 200 mcg/ day

Foodstuff	Folic acid Ug / 100 gm	Amount of foodstuff in 1500 Kcal Veg diet	Total folic acid content (ug) in 1500 Kcal Veg diet
Spinach	142	200 gm	284
White chana / Rajmah/ Masoor whole	233 / 300/ 230	30 gm	70/90/69
Chana dal/ sabut Mung	182/145	30 gm	55/ 44
Total			404
Additional Foods			
Mango	90	100 gm	90
Peanut	90	10 gm	9

Calcium - RDA 600 mg/ day

Foodstuff	Calcium mg / 100 gm	Amount of foodstuff in 1500 Kcal Veg diet	Total calcium content (mg) in 1500 Kcal Veg diet
Milk	210	250 ml (1 glass)	525
Almonds	230	10 gm	23
Dry coconut	400	15 gm	60
Total			608
Additional foods			
Curd	149	400 (2 Katori)	596
Paneer	208	50	104
Methi	440	100	440
Sesame / poppy Seeds	1450 / 1584	5 gm	72/ 79
Sunflower / chia seeds	280 /631	5gm	14/ 31
Moringa	2185	5 gm	109

Magnesium – 340mg/ day

Foodstuff	Magnesium mg / 100 gm	Amount of foodstuff in 1500 Kcal Veg diet	Total magnesium content (mg)in 1500 Kcal Veg diet
Whole wheat flour	125	80 gm	100
Spinach	87	200 gm	174
White chana / whole moong	160 / 200	30 gm	48 / 60
Sunflower seeds	413	5 gm	21
Almond/ Cashew	318/ 307	10 gm	32 /31
Total			374
Additional foods			
Quinoa	119	20 gm	24
Peanuts	197	20 gm	39
Pumpkin seeds	262	5 gm	13
Chia / Flax seeds	335/ 392	5 gm	17/ 20

Vit- B12 Supplement

- Take the supplement in the morning without food
- Chew the tablet or allow it to dissolve in the mouth to maximise absorption
- Maintain a gap of 2- 3 hrs between Vit B-12 supplement and Vitamin C supplement as it can break down vitamin B-12 in the digestive tract

“Know your Body”



Find the nutritional deficits, if any



Follow the guidelines



Achieve optimal level of nutrients



Get yourself monitored after 3 months to
review the status & maintain it