Multi-Vitamin Bar

Prof. Manasi Ghamande [1],Kinjalk Patil[2],Nikhil Patil [3],Aditya Pawar[4], Sai Phadtare[5],Piyush Khandekar[6],Piyush Munshi[7],Akshata Pokharkar[8]

[1,2,3,4,5,6,7,8] *DESH, Vishwakarma Institute of Technology, Pune(India)*

Abstract

According to a study conducted by Metropolis Healthcare on Vitamin D, Vitamin B12 and Vitamin B9 (Folic Acid) to observe the deficiency and sufficiency of vitamins within the inhabitants across India, 75% of population has shown alarming levels of deficiency.

The widespread prevalence of iron (Fe) and zinc (Zn) deficiency among Indians is not due to the poor mineral content in their diets. It is the poor "bio-availability" of these minerals that makes the largely vegetarian population deficient in these nutrients Overcoming these deficiencies and provide other vitamins and minerals such as vitamin A ,vitamin C , Potassium (K), magnesium(Mg),calcium(Ca)
manganese(Mn) and many other.

Keywords:*biochemistry,deficiency,healthcare,metabolism,nutrition*

1.Introduction

Nutrition, nourishment, or aliment, is the supply of materials - food - required by organisms and cells to stay alive. In science and human medicine, nutrition is the science or practice of consuming and utilizing foods.

Nutritional science studies how the body breaks food down (catabolism) and how it repairs and creates cells and tissue (anabolism). Catabolism and anabolism combined can also be referred to as metabolism. Nutritional science also examines how the body responds to food.

As molecular biology, biochemistry, and genetics advance, nutrition has become more focused on metabolism and metabolic pathways - biochemical steps through which substances inside us are transformed from one form to another.

Nutrition also focuses on how diseases, conditions, and problems can be prevented or reduced with a healthy diet.

Similarly, nutrition involves identifying how certain diseases and conditions may be caused by dietary factors, such as poor diet (malnutrition), food allergies, and food intolerances.

The purpose of the project is basically to provide all the essential nutrients in the requisite daily intake amount as per prescribed by dieticians in the form of a single bar in order to fulfil the daily health necessities of a human body.

This project promises to contribute to provide all health benefits essential for an individual's physical fitness and well-being and minimize the possibility of deficiency of any essential ingredient at its best.

2.1.Oats

Oats are a whole grain cereal , know scientifically as avena sativa. They are very good source of fiber, especially beta-glucan and are high in vitamin , mineral and antioxidants.

Whole oats are the only source of unique group of antioxidants called avenathramids believed to have protective effects against heart disease.

Fig. 1

Calories	Amount
Water	8%
Protein	16.9 g
Carts	66.3 g
Sugar	-
Fiber	10.6 g
Fat	6.9 g
Saturated	1.22 g
Monosaturated	2.18 g
Omega 3	0.11 g
Omega 6	2.42 g
Transfat	--
Magnesium	177mg
Zinc	4mg
Iron	5mg
Phosphorus	523mg
Calcium	54mg
Vitamin B1	0.763mg
Vitamin B2	0.139mg
Vitamin B3	0.961mg
Vitamin B5	1.349mg
Vitamin B6	0.12mg
Vitamin B9	56mcg

2.2.Fortified Seeds(Muesli)

Muesli (pronounced Mews-li) is a fiber- and protein-rich breakfast and brunch option based on raw, rolled oats and other diverse breakfast ingredients.

What began as a dry cereal made from toasted whole oats, nuts, fruit, and wheat flakes, muesli has evolved to become a hodgepodge of a breakfast option with tons of combinations that can be soaked and essentially marinated overnight. Think grains, fresh or dried fruits, seeds, and nuts. The concoction, which is full of vitamins, iron, and magnesium, can also be mixed together with milk (soy, almond, or cow), or yogurt or fruit juice, and left in the fridge overnight.

Vitamin A	40µg
Vitamin C	10 mg
Thamine(Vitamin B1)	0.3mg
Riboflavin(vitaminB2)	0.4 mg
Niacine(vitaminB3)	4 mg
Vitamin B6	0.5 mg
Vitamin B12	0.1µg
Folate	25.2µg
Iron	5.6mg

Fig.2

2.3.Nuts

Peanuts

Fig.3

Manganese	: 24% RDA
Copper	16% RDA
Magnesium	12% RDA
Vitamin B1	12% RDA
Vitamin B3	17% RDA
Vitamin B9	17% RDA

Walnut

Manganese	48% RDA
Copper	22% RDA
Magnesium	11% RDA
Phosphorus	10% RDA
Vitamin B6	8% RDA
Vitamin B9	7%RDA

Fig.4

2.4.Brown rice

Brown rice is a whole grain, meaning that it contains three parts of the grain kernel: the outer, fiber-filled layer called the bran, the nutrient-rich core called the germ, and the starchy middle layer called the endosperm.

Brown rice is a highly nutritious food. It is a whole grain that is relatively low in calories (216 calories per cup), high in fiber, gluten-free and can be incorporated into a variety of dishes. The USA Rice Federation notes that brown rice contains no trans-fat or cholesterol. It has only trace amounts of fat and sodium.

Nutrients	Nutritional Value
Vitamin B1	0.401 mg
Vitamin B2	0.093mg
Vitamin B3	5.091mg
Vitamin B5	1.493mg
Vitamin B6	0.509mg
Vitamin B9	20 mcg
Calcium	23 mg
Iron	1.47 mg
Potassium	223 mg
Magnesium	223mg

Fig.5

2.5.Dry Fruits(raisins)

Raisins are dried grapes/currants. However, unlike fresh grapes, they indeed are rich and concentrated sources of energy, vitamins, electrolytes, and minerals. On a weight per weight comparison basis, 100 g of dried grapes hold 249 calories, several times more fiber, vitamins, minerals and polyphenol antioxidants than the fresh grapes. Raisins, however, contain fewer amounts of vitamin-C, folic acid, carotenes, lutein and xanthins than fresh grapes.

Fig.6

Principle	Nutrient Value	Percentage of RDA
Energy	299 Kcal	15%
Carbohydrates	79.18 g	61%
Protein	3.07 g	5.5%
Total Fat	0.46 g	1.5%
Cholesterol	0 mg	0%
Dietary Fiber	3.7 g	10%
Vitamins		
Folates	5 µg	1%
Niacin	0.766 mg	5%
Pantothenic acid	0.095 mg	2%
Pyridoxine	0.0174 mg	13%
Riboflavin	0.125 mg	10%
Thiamin	0.106 mg	9%
Vitamin A	0 IU	0%
Vitamin C	2.3 mg	4%
Vitamin E	0.12 mg	1%
Vitamin K	3.5 µg	3%
Sodium	11%	1 mg
Potassium	749 mg	16%
Minerals		
Calcium	50 mg	5%
Copper	0.318 mg	35%
Iron	1.88 mg	23%
Magnesium	7 mg	2%
Manganese	0.299 mg	12%
Phosphorus	101 mg	15%
Selenium	0.6 µg	1%
Zinc	0.22 mg	2%

2.6. Pumpkin Seeds

Pumpkin seeds (pepita) are edible kernels of fruit pumpkin. The seeds, indeed, are concentrated sources of many health-benefiting vitamins, minerals, antioxidants, and essential amino acids such as **tryptophan, and glutamate.**

Pumpkin fruit is a squash-like gourd in the *Cucurbitaceae* family of vegetables native to Mexico.

The pumpkin fruit, in general, is grown as a field vegetable crop. Its seeds, at the same time, have been in use as food, and to extract pumpkin seed oil since centuries. In fact, in some parts of central Europe (Styrian province in Austria, Slovenia, and Hungary), pumpkins are being cultivated solely for their seeds, as a major oilseed crop at a commercial scale.

Fig.7

Principle	Nutrient Value	Percentage of RDA
Energy	559 Kcal	28%
Carbohydrates	10.71 g	8%
Protein	30.23 g	54%
Total Fat	49.05 g	164%
Cholesterol	0 mg	0%
Dietary Fiber	6 g	16%
Vitamins		
Folates	58 µg	15%
Niacin	4.987 mg	31%
Pantothenic acid	0.750 mg	15%
Pyridoxine	0.143 mg	11%
Riboflavin	0.153 mg	12%
Thiamin	0.273 mg	23%
Vitamin A	16 IU	0.5%
Vitamin C	1.9 µg	3%
Vitamin E	35.10 mg	237%
Electrolytes		
Sodium	7 mg	0.5%
Potassium	809 mg	17%
Minerals		
Calcium	46 mg	4.5%
Copper	1.343 mg	149%
Iron	8.82 mg	110%
Magnesium	592 mg	148%
Manganese	4.543 mg	198%
Phosphorus	1233 mg	176%
Selenium	9.4 µg	17%
Zinc	7.81 mg	71%

2.7.Quinoa

Quinoa is one of the world's most popular health foods.

Quinoa is gluten-free, high in protein and one of the few plant foods that contain all nine essential amino acids.

It is also high in fiber, magnesium, B vitamins, iron, potassium, calcium, phosphorus, vitamin E and various beneficial antioxidants.

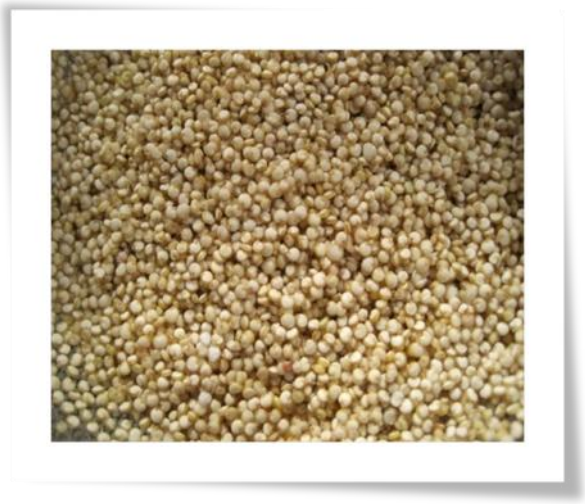

Fig.8

Vitamins		
Folates (B9)	184 µg	46%
Niacin (B3)	1.520 mg	9.5%
Riboflavin (B2)	0.318 mg	24%
Thiamin (B1)	0.360 mg	30%
Vitamin A	14 IU	0.5%
Vitamin E	2.44 mg	17%
Vitamin K	0	0%
Electrolytes		
Sodium	5 mg	<1%
Potassium	563 mg	12%
Minerals		
Calcium	47 mg	5%
Copper	0.590 mg	65.5%
Iron	4.57 mg	57%
Magnesium	197 mg	42%
Manganese	2.003 mg	87%
Phosphorus	457 mg	65%
Selenium	8.5 µg	15%
Zinc	3.10 mg	28%

2.8.Lima beans

Sometimes called "butter beans" because of their starchy yet buttery texture, lima beans have a delicate flavor that complements a wide variety of dishes. Although fresh lima beans are often difficult to find, they are worth looking for in the summer and fall when they are in season. Dried and canned lima beans are available throughout the year.

The pod of the lima bean is flat, oblong and slightly curved, averaging about three inches in length. Within the pod are the two to four flat kidney-shaped seeds that we call lima beans. The seeds are generally cream or green in color, although certain varieties feature colors such as white, red, purple, brown or black.

Fig.9

Principle	Nutrient Value	Percentage of RDA
Energy	338 Kcal	17%
Carbohydrates	63.38 g	49%
Protein	21.46 g	38%
Total Fat	0.69 g	3.5%
Cholesterol	0 mg	0%
Dietary Fiber	19 g	50%
Vitamins		
Folates	395 µg	99%
Niacin	1.537 mg	9%
Pantothenic acid	1.355 mg	27.1%
Pyridoxine	0.512 mg	39%
Riboflavin	0.202 mg	16%
Thiamin	0.507 mg	42%
Vitamin A	0 IU	0%
Vitamin C	0 mg	0%
Vitamin E	0.72 mg	5%
Vitamin K	6 µg	5%
Electrolytes		
Sodium	18 mg	1%
Potassium	1724 mg	38%
Minerals		
Calcium	81 mg	8%
Copper	0.740 µg	82%
Iron	7.51 mg	94%
Magnesium	224 mg	56%
Manganese	1.672 mg	73%
Phosphorus	385 mg	55%
Selenium	7.2 µg	13%
Zinc	2.83 mg	26%

2.9.Orange Juice

One serving of orange juice has all the vitamin C you for a whole day. Orange juice is also high in potassium, and it's a good source of folate and thiamine, two of the B-complex vitamins.

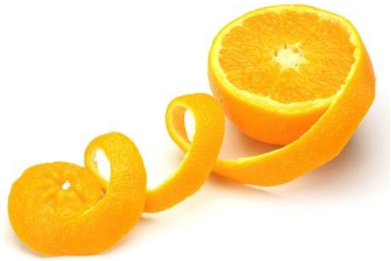

Fig.10

Nutrients	Nutritional Value
Calories	47
Water	87%RDA
Protein	0.9 g
Carbs	11.8 g
Sugar	9.4 g
Fiber	2.4 g
Fat	0.1 g
Saturated	0.02 g
Monosaturated	0.02 g

2.10.Almond

Almonds originated in the Middle East and only recently spread around the world. They are one of the healthiest kinds of nuts and absolutely packed with beneficial nutrients.

Fig.11

Almonds are also high in phytic acid, a substance that binds certain minerals and prevents them from being absorbed.

While phytic acid is generally considered a healthy antioxidant, it also slightly reduces the amount of iron, zinc and calcium you get from almonds.

Principle	Nutrient Value	Percentage of RDA
Energy	579 Kcal	29%
Carbohydrates	21.55 g	16%
Protein	21.15 g	38%
Total Fat	49.93 g	165%
Cholesterol	0 mg	0%
Dietary Fiber	12.50 g	30%
Vitamins		
Folates	44 µg	12.5%
Niacin	3.618 mg	21%
Pantothenic acid	0.47 mg	9%
Pyridoxine	0.137 mg	11%
Riboflavin	1.138 mg	78%
Thiamin	0.205 mg	16%
Vitamin A	2 IU	0%
Vitamin C	0 mg	0%
Vitamin E	26 mg	173%
Electrolytes		
Sodium	1 mg	0%
Potassium	733 mg	15%
Minerals		
Calcium	269 mg	27%
Copper	0.996 mg	110%
Iron	3.71 mg	46.5%
Magnesium	270 mg	67%
Manganese	2.285 mg	99%
Phosphorus	481 mg	69%
Selenium	2.5 µg	4.5%
Zinc	3.12 mg	28%

2.12. Cashews

The cashew nut, often simply called a cashew, is widely consumed. It is eaten on its own, used in recipes, or processed into cashew cheese or cashew butter. The shell of the cashew seed yields derivatives that can be used in many applications including lubricants, waterproofing, paints, and arms production

Fig.12

Principle	Nutrient Value	Percentage of RDA
Energy	553 Kcal	28%
Carbohydrates	30.19 g	23%
Protein	18.22 g	32.5%
Total Fat	43.85 g	146%
Cholesterol	0 mg	0%
Dietary Fiber	3.3 g	8.5%
Vitamins		
Folates	25 µg	6%
Niacin	1.062 mg	6.5%
Pantothenic acid	0.864 mg	17%
Pyridoxine	0.417 mg	32%
Riboflavin	0.058 mg	4.5%
Thiamin	0.423 mg	35%
Vitamin A	0 IU	0%
Vitamin C	0.5 mg	1%
Vitamin E	5.31 mg	35%
Vitamin K	34.1 µg	28%
Electrolytes		
Sodium	12 mg	1%
Potassium	660 mg	14%
Minerals		
Calcium	37 mg	4%
Copper	2.195 mg	244%
Iron	6.68 mg	83.5%
Magnesium	292 mg	73%
Manganese	1.655 mg	72%
Phosphorus	593 mg	85%
Selenium	19.9 µg	36%
Zinc	5.78 mg	52.5%

2.13. Flaxseeds

Flax (*Linumusitatissimum*), also known as **common flax** or **linseed**, is a member of the genus *Linum* in the family Linaceae. It is a food and fiber crop cultivated in cooler regions of the world. The textiles made from flax are known in the Western countries as linen, and traditionally used for bed sheets, underclothes, and table linen. The oil is known as linseed oil. In addition to referring to the plant itself, the word "flax" may refer to the unspun fibers of the flax plant.

Fig.13

Principle	Nutrient Value	Percentage of RDA
Energy	534 Kcal	27%
Carbohydrates	28.8 g	22%
Protein	18.3 g	32.5%
Total Fat	42.16 g	170%
Cholesterol	0 mg	0%
Dietary Fiber	27.3 g	68%
Vitamins		
Folates	87 µg	22%
Niacin	3.08 mg	19%
Pantothenic acid	0.985 mg	20%
Pyridoxine	0.473 mg	36%
Riboflavin	0.161 mg	12%
Thiamin	1.64 mg	137%
Vitamin A	0 IU	0%
Vitamin C	0.6 mg	1%
Vitamin E	19.95 mg	133%
Vitamin K	4.3 µg	3.5%
Electrolytes		
Sodium	30 mg	2%
Potassium	813 mg	17%
Minerals		
Calcium	255 mg	22.5%
Copper	1.12 mg	124%
Iron	5.73 mg	72%
Magnesium	392 mg	98%
Manganese	2.48 mg	108%
Zinc	4.34 mg	39%

2.14 Dates

Dates have an excellent nutrition profile.

Since they're dried, their calorie content is higher than most fresh fruit. The calorie content of dates is similar to that of other dried fruits, such as raisins and figs (1).

Most of the calories in dates come from carbs. The rest are from a very small amount of protein. Despite their calories, dates contain some important vitamins and minerals in addition to a significant amount of fiber.

Fig.14

Vitamins		
Folates	15 µg	4%
Niacin	1.610 mg	10%
Pantothenic acid	0.805 mg	16%
Pyridoxine	0.249 mg	19%
Riboflavin	0.060 mg	4.5%
Thiamin	0.050 mg	4%
Vitamin A	149 IU	5%
Vitamin C	0 mg	0%
Vitamin K	2.7 µg	2%
Electrolytes		
Sodium	1 mg	0%
Potassium	696 mg	16%
Minerals		
Calcium	64 mg	6.5%
Copper	0.362 mg	40%
Iron	0.90 mg	11%
Magnesium	54 mg	13%
Manganese	0.296 mg	13%
Phosphorus	62 mg	9%
Zinc	0.44 mg	4%

Procedure

Melt the chocolate in a bowl on a pot with water on hob. Make sure that you have enough chocolate. After solid chocolate converted into a liquid. Add small amount of orange juice and dates syrup to it. The quantity of dates syrup should be 3 times of Orange juice added. Now cut the Nuts in bits. Grind the brown rice, oats, pumpkin seeds , Quinoa , flax seeds , fortified seeds , raisins till all this transform to a power form. After that Roast the nuts and power mixture lightly. Slowly we get golden colour to mixture then stop roasting it.

Add all these to chocolate and mix it. Spread it equally between two rulars on the marble surface. When the chocolate is completely dry cut it into small pieces.

Fig.15

Conclusion

Put simply, a multivitamin is a nutritional supplement that includes a combination of vitamins, and often minerals. Vitamins are good for you, right? So it should be a no-brainer: why not take a multivitamin.

The hitch is that there is no standard or regulatory definition for multivitamins, meaning that the composition and quality can vary significantly from product to product.

Originally designed to protect against micronutrient deficiencies resulting from inadequate dietary intake, multivitamins' application has been broadened over time. Now not only do you have vitamins to supplement nutrient deficiencies, but products with specialized formulas which purport to meet a variety of goals, including: increasing performance, aiding in weight loss, protecting against cancer and other illnesses, and improving longevity.