

1 **Exploring Potential Deficiencies in Vegetarian diets**

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27 **Introduction:**

28 Restrictive diets can be followed by adults and kids for a variety of reasons, such as  
29 medical need, the desire to lose weight, trendiness, purported health benefits, animal  
30 rights, or environmental impact. 40% of teenagers and over half of American adults say  
31 they have tried weight loss on a yearly basis(Andrewski et al., 2022).

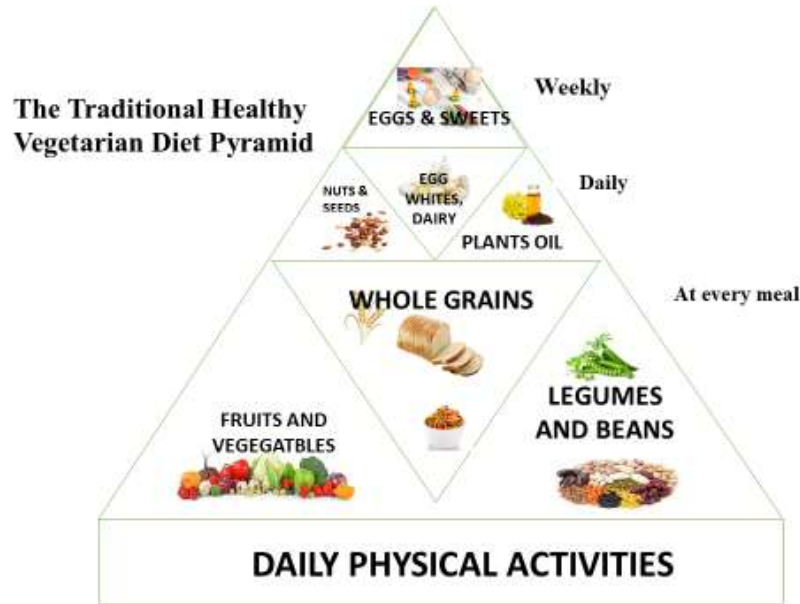
32 Diets high in vegetables are often safe under the watchful eye of knowledgeable  
33 healthcare organizations. Individuals following these diets, regardless of the reason, may  
34 be unintentionally putting themselves at risk for nutritional deficiencies if they are not  
35 properly monitored and supplemented(Wallace et al., 2020).

36 Unlike vegetarian and gluten-free diets, the KD is linked to serious side effects that can  
37 be fatal, including as cardiac arrhythmia, renal failure, and nephrolithiasis. As such, it  
38 must be closely monitored by a qualified healthcare practitioner. A lack of nutrients, such  
39 as those in thiamine, vitamin D, magnesium, phosphorous, copper, zinc, selenium, and  
40 carnitine, can be linked to KD since there are less food options available to them.  
41 Research has indicated that the more stringent.Children on 4:1 ratio meet only 3 if 28  
42 daily dietary reference intakes, while those on a 1:1 ratio meet 12 of the 28 dietary  
43 reference. The higher to the lipid- to-non lipid ratio is greater the chance of nutritional  
44 deficiencies. Solid foods specialist commercial formula or a combination of the two may  
45 be included (Nardo et al., 2019).

46 Malnutrition is a lack of harmony between the vitamins your body desires characteristics  
47 and the nutrients it receives. It can recommend undernutrition or over nutrition. You may  
48 be undernourished from a usual loss of calories, or you would possibly have a protein,  
49 nutrition or mineral deficiency. Your body desire loads of vitamins, and in reliable  
50 amounts, to grip its tissues and its many characteristics. Malnutrition takes place while  
51 the vitamins it receives don't meet those needs. You can be malnourished from a general  
52 lack of nutrients, or you could have a plenty of a few varieties of nutrients but lack  
53 different types. Even the lack of a single nutrition or mineral will have severe health  
54 outcomes on your body. On the other hand, having an excess of nutrients also can  
55 purpose difficulty.Nutritional deficiencies is a circumstance in which there is insufficient  
56 meals to satisfy energy needs; its main traits consist of weight reduction, failure to thrive,  
57 and losing of frame fats and muscle groups (Silva et al., 2022).

58

59 **Vegetarian diet:**



60

61 **Figure No 1: Traditional healthy vegetarian diet pyramid**

62 Vegetarian or the complete avoidance of animal products is becoming more and more  
63 popular in America. Of the population between ages of 8 and 18, 1percent are thought to  
64 be vegetarian. There is a range of eating habits which come under label “vegetarian,”  
65 some of which are more demanding than others. As a result, depending on the meal  
66 picked, nutritional intake can differ greatly. Even among particular subgroups, like lacto-  
67 vegetarians, dietary difference can still be actually visible (Asher& Peters 2020).

68 All animal merchandise is averted by means of vegetarians, even as a few subtypes may  
69 eat dairy, eggs, fish, or honey. The majority of human beings following a macrobiotic  
70 weight loss plan abstain from beef, poultry, butter, lard, eggs, and dairy products,  
71 however they're no longer absolutely vegetarians. Some can also once in a while eat fish.  
72 They additionally stress the want to live far from GMOs and to shop for food that is  
73 sourced locally. Any regular removal of any group of foods from diet, for any reason be it  
74 a sincere desire to keep away from meat or a reaction to an allergy to a specific food, like  
75 cow’s milk puts nutritional health risk. In spite of explanation below avoiding the food  
76 group. It’s important to keep the diet nutritionally complete and balanced to prevent  
77 deficiencies and maintain suitable nutrient levels. It is projected that the overall number

78 will rise as animal's rights problems as more Americans cut out on some of or all of their  
79 animal products used due to claimed nutritional benefits, animal rights concerns, and  
80 climate change. As long as the diets are "well-balanced," they have said to be safe for all  
81 life stages, including pregnancy, infancy, childhood, and adolescence (Vos et al., 2021).

82 Latest survey of adult UK diets, meat and meat products significantly supply a variety of  
83 nutrients. On the other hand, studies on plant-based diets show that they are higher in  
84 antioxidants, phytochemicals, carotenoids, fibers and folate and lower in animal proteins,  
85 cholesterol and saturated fats when compared to omnivorous diet. Vegetarians could still  
86 consume insufficient amounts of calcium, vitamin B12 and vitamin D (Kiely & M. E  
87 2021).

### 88 **Micronutrient:**

89 Most people are aware that trace elements and nutrients—also referred to as "micro-  
90 vitamins" globally—are essential parts of diet for both health and illness. However,  
91 physicians continue to have limited expertise in this area; trace elements are even less  
92 well-known than nutrients. There are two categories of issues: 1) personal health and 2)  
93 public fitness. International recommendations are available to the public as RDAs  
94 (recommended dietary allowances), or more commonly these days as DRIs (Dietary  
95 Reference Intakes). The micronutrient (MN) deficits that are a global health concern are  
96 addressed by these recommendations (Cakmak et al., 2023).

97 The majority of the most significant health risk factors in the world include deficiencies  
98 in iodine, iron, zinc, and vitamin A. The World Health Organization (WHO) and Food and  
99 Agriculture Organization (FAO) have established a sizable global MN database to  
100 address public health issues and the common endemic deficiencies of certain MNs that  
101 may necessitate assistance through fortification (Ritchie & Roser 2024).

102 As mentioned before, food starting from animals; including meat and meat derivatives,  
103 are good source of specific vitamins and minerals. For instance, milk and dairy products  
104 are rich in calcium that is bioavailable and give useful levels of a wide range of other  
105 minerals and vitamins; red meat is a good source of iron, zinc, and vitamin A and  
106 Vitamin B12; and fatty fish is rich in vitamin D. In addition, some plant-based diet  
107 contains ingredients that change how certain micronutrients are absorbed and utilized. For  
108 example, excessive amounts of wheat fibers are linked to the formation of phytates,  
109 which could prevent the absorption of minerals like iron and zinc. Considering these

110 characteristics, it makes sense to consider if vegetarian diets offer sufficient levels of  
111 micronutrients(Berger et al., 2022).

112 **Table no 1: Micronutrients and their sources**

ELEMENTS	SOURCES
VITAMIN B12	Egg, Beef, Milk, Nutritional yeast.
VITAMIN D	Mushrooms, Egg yolks ,orange juice.
IRON	Lentils, Nuts and Seeds, Dried fruits.
ZINC	Oysters, Pumpkin seed, Cashew nut.
VITAMIN A	Egg, Liver, Sweet Potatoes.
Calcium	Milk, Yogurt, Cheese, Green vegetables.
Biotin	Legumes, egg yolks, organ meats, nuts.
Vitamin C	Citrus fruit, peppers, blackcurrants.
Vitamin B1	Fortified cereal, bread, brown rice, peas.
Vitamin B2	Milk, bread, eggs, almonds, beef, cheese.

113

114 **What is macronutrient:**

115 There are three major kinds of macro nutrients, carbohydrates, these are the bodies  
116 number once apply of electricity. They consist of sugars starches and fibers determine  
117 ingredients like culmination green and legumes (Hawkes ford et al., 2023).

118 **Proteins**, are vital for building and repairing within the frame, such as,muscles group  
119 organ, and skin. Foods rich in proteins consist of meat, fish fowl, eggs, dairy products  
120 beans and nuts,

121 **Fats**,Macronutrients are the critical vitamins nutrients that our bodies need in relatively  
122 large amounts to function properly. Fats function a focused a source of electricity and  
123 health take in short nutrients. They also play a position in keeping cell shape and helping  
124 brain characteristics. Healthy source of fat present in avocados, nuts, seeds, olive oil and  
125 fatty fish. These macronutrients are important for health nicely being and a balanced food  
126 plan and meat to include ok quantities to each to fulfill the frame wishes (Denton et al.,  
127 2022).

128 **Micronutrient Deficiency in diet:**

129 Micronutrient deficiencies impact more than a billion people worldwide, and also limit  
130 crop output in many regions of the world. By inoculating arable soils with

131 microorganisms that mobilize micronutrients and increase their availability to agricultural  
132 plant life in a way that is both environmentally sustainable and highly effective, microbial  
133 bio fertilizers should be able to combat these issue (McKay et al., 2020).

134 However, complicated interactions between micronutrients, microbes, and plants limit the  
135 broad applications of bio fertilizers and augment our standard understanding of the use of  
136 bio fertilizers in food crop development. We reduce their efficacy in controlled  
137 environments. Here, we provide an overview of the seven-micronutrient kingdom as it  
138 exists today in food production. We examine the mechanisms underlying the mobilization  
139 of micronutrients by microbes in natural environments and summarize current knowledge  
140 to show that while soil conditions have a major impact on soil micronutrient  
141 concentrations, land control techniques can also have a major impact on micronutrient  
142 availability and flora uptake (Kumar et al., 2021).

143 While there are differences in the efficacy of bio fertilizers, there are clear benefits to  
144 using them in conjunction with conventional inorganic or natural fertilizers, as indicated  
145 by a number of lines of evidence. Examples of microbial taxa that may mobilize multiple  
146 micronutrients while enduring harsh environmental circumstances are provided by studies  
147 on micronutrient cycling in herbal habitats. Studies on the processes behind the microbial  
148 utilization of nutrients in natural process (Peddie et al., 2023).

149 **Iron deficiency in vegetarian diet:**

150 Iron deficiency is a common and difficult issue in young people. It is essential to consider  
151 suggested daily intake of iron in connection to an adolescent's physical activity, dietary  
152 choices and initial iron losses in order to prevent, find and treat iron deficiency in this age  
153 range.

154 The most frequent nutritional problem in the UK population is iron deficiency, with low  
155 serum blood iron concentrations and a high frequency of anemia in babies. Children who  
156 take in meat and those who are vegetarians may both be at risk for iron deficiency. Due to  
157 possible connections to mental and motor development, the level of iron in all newborns  
158 is significant (Pasricha et al., 2021).

159 The iron level in amounts indicate that iron stores have been reduced in normal newborns  
160 by six months of age. Nutritional requirements indicates that newborns between ages of  
161 six and twelve months are given a range of meals in order to ensure that they are getting  
162 dietary sources of minerals. Specifically, for vegetarian children that are dietary iron

163 supplies are less well absorbed than the heme-iron found in meat and meat are products  
164 used by omnivorous infants, it is Important to make sure that get enough vitamin C avoid  
165 foods that inhibit iron absorption such as tea and higher fiber foods and use foods that  
166 have been enhanced with iron. On the basis of day 4 day dietary data and hematological  
167 and biochemical nutrition indicates, nutritional intakes and nutritional status were usually  
168 accepted in a sub example of 51 preschooler's from the NDNS of children aged 1.5-1.4  
169 years who did not report using meat (Than an & Bates 2000), however, when compared  
170 to omnivores , vegetarians children serum ferritin levels were much lower, particularly in  
171 younger children in addition to having greater antioxidant vitamin intakes and status  
172 indices, the vegetarian children also had decreased intakes of fat cholesterol, and sodium.  
173 Indicates hemoglobin levels were lower in vegetarian children than in meat eating  
174 children (11.9g/dl vs 12.4g/dl in a study of 50 matched "pairs" of children (mean age at  
175 recruitment: 9 years) (Nathan et al.,1996), which indicates lower availability of iron from  
176 the vegetarian's diet or, alternatively the value of including meat in the diets of the meat-  
177 eaters(Bora et al., 2021).

178 People who have low iron intake and consume small amount of red meat can get about  
179 half of their iron absorption from heme iron. However, since iron absorption is poor in  
180 people with low body stores, contribution of iron to total iron does not exceed that of  
181 heme iron. Therefore, non-heme iron is generally poorly absorbed in a vegetarian diet and  
182 like heme iron is due to many of changes in body iron. People with high iron stores may  
183 limit their absorption of non-heme iron more, while people with low iron stores can  
184 absorb non-heme iron almost as well as heme iron. However, the absorption deficiency of  
185 non-heme iron from iron stores is low. Although a vegetarian diet includes different  
186 components such as non-vegetarian foods, many vegetarians can consume fruits and  
187 vegetables, beans and pulses by replacing main foods with whole grains. Dietary factors  
188 that influence intestinal solubility and non-heme iron absorption may be modified by such  
189 dietary choices. Halberd and Heathen examines these dietary interactions and proposed a  
190 method to determine enhancing or inhibiting effects of dietary iron with foods. It is  
191 unclear whether the effects of ascorbic acid and pigments on non-heme iron absorption  
192 extend to effects of vegetarians in general. Choosing a vegetarian diet with a variety of  
193 foods, while reducing iron intake may provide health benefits without the risk of iron  
194 deficiency anemia. Another similar study did not confirm previous association between  
195 high serum iron and cardiovascular disease. However genetic "carriers" of mutations

196 associated with iron-storing hemochromatosis have been shown to have an increased risk  
197 of cardiovascular insulin levels than lactovegetarians because they have higher serum  
198 ferritin (Chourraqui & J. P 2022).

### 199 **Zinc deficiency in vegetarian Diet:**

200 Zinc deficiency reduces immunity to infection and affects both human and  
201 cell-mediated immunity. Taking zinc supplements has been shown to reduce the risk of  
202 infection and cell damage caused by oxidative stress. Liver diseases both acute and  
203 chronic is associated with zinc deficiency. Zinc supplementation protects against toxin-  
204 induced liver damage and is a treatment for hepatic encephalopathy in patients  
205 unresponsive to conventional care. Diarrheal illnesses have been associated with zinc  
206 deficiency and zinc supplements have been shown to be helpful in preventing and  
207 managing a Ute diarrhea. Most of the zinc in US diet comes from beef, and more than  
208 half of zinc comes from animal products (Khan et al., 2022).

209 While it is possible to follow zinc-containing foods similar to non-vegetarian foods, this  
210 preparation may require special use of legumes, whole grains, fruits and seeds. In  
211 addition, zinc may not be bioavailable in non-vegetarian food, legumes, whole grain, nuts  
212 and seeds are rich in zinc, but they also contain phytic acids which removes zinc from  
213 body. Although a high protein diet increases zinc bioavailability; however, protein foods  
214 are rich in phytic acid. These foods contain more zinc than zinc-deficient foods, but their  
215 high phytate content may reduce the amount of zinc absorbed from unprocessed foods.  
216 For example, a serving of whole grain bread contains almost 50% more zinc than a  
217 serving of white bread (0.22 mg instead of 0.15 mg respectively), because whole bread is  
218 more likely to be lower in zinc. Ingredients of white bread, zinc absorption rate (16.6%,  
219 not 38.2% respectively) (Schoofs et al., 2024).

220 According to the World Health Organization (WHO) a lacto-vegetarian or vegan diet with  
221 a molar ratio of phytate to zinc of 5-15 is classified as having intermediate zinc  
222 bioavailability (30-35% absorption). On the other hand, a diet with high zinc  
223 bioavailability (50-50% absorption) is characterized by good processing, small amounts  
224 of cereal fibers, a zinc phytate molar ratio of less than 5 and sufficient protein from  
225 animals. Research has shown that foods with low zinc bioavailability (absorption rate of  
226 15%) include high amounts of raw rice and zinc phytate rate of more than 15. High-  
227 phytate foods provide energy and general, most soy products provide protein, less



228 phytates, contain zinc content. Increased calcium levels may also reduce zinc  
229 bioavailability. On a controlled diet, zinc absorption in postmenopausal women was  
230 significantly reduced (from 3.6 mg/day to 2.0 mg/day) when simple carbohydrates were  
231 substituted for meat. Zinc, supplements reduce zinc absorption, avoiding a low-fat diet  
232 with meat-derived foods will not increase zinc absorption. Vegetarians especially those  
233 with a phytate to zinc molar ratio greater than 15 may require 50% more zinc than  
234 vegetarians due to decreased zinc absorption. This is based on measurement of zinc  
235 absorption from a controlled diet: Zinc absorption is reduced by approximately 35%  
236 compared with non-vegetarian foods and non-heme iron absorption is reduced with the  
237 same lacto-vegetarian foods. A 70% estimate increases total iron absorption by  
238 approximately 85%. Zinc phytate molar ratios for lacto-vegetarian and non-vegetarian  
239 foods are 5 and 14 respectively, due to the replacement of meat with legumes, whole  
240 grains, seeds and nuts. After four weeks of fasting women received less zinc from  
241 vegetarian diet Hunt & J R (Grüngreiff et al.,2022).

#### 242 **Calcium deficiency in vegetarian Diet:**

243 You can get calcium from calcium-rich foods, fortified foods and beverages,  
244 supplements or a combination of these sources. It is important to consider calcium content  
245 and bioavailability when evaluating calcium products. The amount of calcium that can be  
246 absorbed per serving from many oxalate free plant resources as well as some oxalate rich  
247 plant foods such as beans and spinach. Since then we have examined many dairy products  
248 as well as other oxalate-rich foods and vegetables popular in China. Dairy products  
249 contain more than 75% of the calcium consumed in the American diet. Foods derived  
250 from plants contain oxalates and phytates, which inhibit calcium absorption and can  
251 affect calcium bioavailability. This may be why between bone mass and milk calcium  
252 was higher than that of non-milk calcium in 835 Chinese women. The oxalic acid content  
253 in foods is generally inversely proportional to amount of calcium absorbed (Chuang et al.,  
254 2021).

255 Therefore, the bioavailability of calcium is low in sweet potatoes such as spinach and  
256 rhubarb in United States and China, and high in low-oxalate plants such as Broccoli, and  
257 cabbage. Soybeans are high in oxalates and phytates, commercial products are better  
258 sources of calcium. Conversely, regular dried beans also contain phatic acid. The  
259 bioavailability of calcium is higher in oxalate-free vegetables than in milk, which means

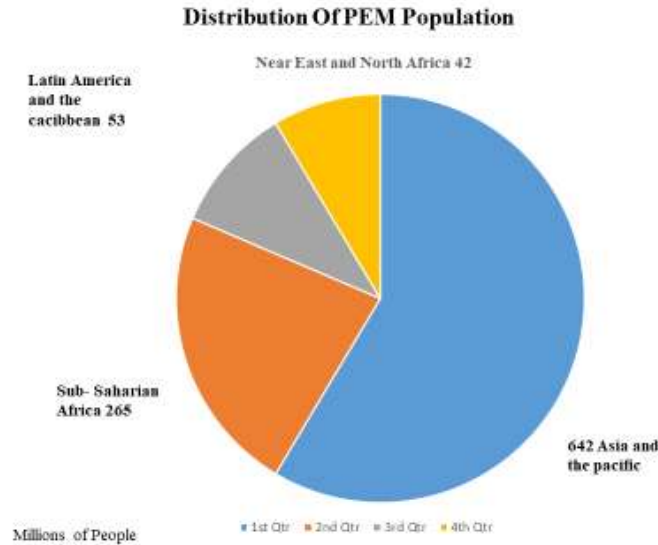
260 two things. First, fiber in vegetables does not prevent the body from absorbing calcium.  
261 This has been shown for pure fibers. Second, vegetables that do not contain oxalates may  
262 have unabsorbed calcium. Because many plants (such as vegetables, fruits and grains) are  
263 low in calcium, most Americans get their needs from these foods. For this reason, it may  
264 be good for those who decide not to drink milk to include calcium-enriched foods and  
265 supplements in their diet (Falsetto et al 2022).

266 **Micronutrient Deficiency in diet:**

267 **Protein-energy malnutrition (PEM):**

268 Protein-energy malnutrition (PEM) is a disorder in which people absorb very little in the  
269 way of proteins, energy, or both. As a result, it is frequently seen in developing nations as  
270 a result of inadequate dietary consumption. The two main illnesses associated with this  
271 condition are kwashiorkor, which is characterized by an extreme protein deficit, and  
272 marasmus, which is extreme meal deprivation with exceptionally low amounts of protein  
273 and strength. The Global Database on Child Growth and Malnutrition (from 1980-1993)  
274 maintained by the World Health Organization (WHO) has demonstrated that  
275 approximately one in three children worldwide suffer from PEM, with eighty percent of  
276 these children residing in Asian countries.

277 Babies suffering from marasmus are abnormally underweight due to the loss of nearly all  
278 of their subcutaneous fat. Their body is extremely weak and more susceptible to diseases  
279 because it seems like it is made up entirely of bones and skin. Extremely low calorie  
280 intake from all sources, including protein, is the main cause of this illness. Malnutrition  
281 could cause marasmus to die if it is not handled properly (Ahmad et al., 2020).



282

283 **Figure 2: Distribution of Power Energy Malnutrition Population**

284 **Carbohydrates deficiencies:**

285 Certain human body cells, such as neurons, require an excessive amount of glucose. Since  
 286 dietary carbohydrates are insufficient, gluconeogenesis is dependent on the breakdown of  
 287 amino acids, which can be supplied from body proteins, nutritional proteins, or lipids'  
 288 glycerol. The liver is the primary site of glucose synthesis. An extended duration of  
 289 insufficient carbohydrate consumption should result in ketosis (expanded ketones  
 290 seasoned-duction), which is typified by an unusually sweet-smelling patient's breath.  
 291 Consuming 50 to 100 g of carbohydrates per day will help prevent ketosis and other  
 292 headaches associated with low carbohydrate intake; but, for a balanced and healthful diet,  
 293 at least half of the daily calorie need must be met by carbohydrates (Tondt et al., 2020)

294 **Nutritional deficiencies and adverse effects:**

295 lack in vitamins, minerals, and macronutrients have been reported in patients limiting  
 296 their intake of animal products.

297 **Vitamin B12 deficiency:**

298 Animal derived products supply a large amount of **vitamin B 12**, which is only generated  
 299 by microbes. Vitamin B 12 deficiency is a well-known problem that can also effect non-  
 300 vegan's eggs, dairy, fish or meat. In the absence of sufficient supplements, deficiencies  
 301 arise and can lead to macrocytic anemia and neurologic deficiencies of the dorsal column.  
 302 One study looked at strict macrobiotic vegan infants via infancy; even after animal

303 byproducts were reintroduced as adolescents multiple 0.33 continued to have a low  
304 amount cobalamin, displaying that changing one's diet only is inadequate to replenish  
305 serum vitamin B12, displaying that changing one's diet only is inadequate to replenish  
306 serum Vitamin B12(Ankara&Kumar 2022).

307 **Vitamin A deficiency:**

308 One of the most common nutritional deficiencies in underdeveloped nations is a lack of  
309 **vitamin A**, which is generally linked to ophthalmologic disorders. Diet A represents  
310 necessary to preserve the integrity of the epithelial tissues in the respiratory,  
311 gastrointestinal, and urinary systems as well as in the eye. The first signs of a vitamin A  
312 deficit include night blindness, xerophthalmia, and improvement of Bigot spots. As the  
313 vitamin A shortage worsens, permanent impairment and keratomalacia may occur. The  
314 World Health Organization (WHO) indicates that between 70 and 80 million children  
315 global experience subclinical vitamin A deficiency, a condition that does not appear to  
316 exhibit any symptoms or indicators. Children with mild diet A insufficiency have slower  
317 body growth and a higher risk to infections (Xu et al., 2021).

318 **Vitamin B6 deficiency:**

319 However, it is not very frequently, **vitamin B6** insufficiency can be brought on by some  
320 medications, malabsorption, and inadequate food consumption. Individuals who are  
321 malnourished, aged, or anorexic are more likely to experience a deficit in vitamin B6.  
322 Alcoholics are also a greater likelihood to experience deficiencies because alcohol  
323 increases the body's catabolism of vitamin B6, a vitamin they consume in horrible  
324 amounts. A shortage in vitamin B6 causes peripheral neuropathy, anemia, cheilosis,  
325 glossitis, seborrheic dermatitis, depression, Crohn's disease, and seizures. Drugs have the  
326 ability to bind vitamin B6, increasing its excretion or decreasing its enzymatic activity  
327 (Sarwar et al 2021).

328 **Folate deficiency:**

329 A shortage folate Folic acid, or vitamin B9, and vitamin B12 have a number of closely  
330 related roles. Folate is necessary for the production of purines and thymidylate and  
331 additionally plays a role in the synthesis, stability, and repair of DNA. Moreover, folate  
332 affects alterations in DNA methylation patterns and carbon metabolism. Because alcohol  
333 slows down the absorption of vitamins, heavy alcohol use might result in folic acid  
334 deficiency. People who are deficient in folate experience fatigue as well as weakness due  
335 to megaloblastic anemia. Deficiency in folate during pregnancy is associated with neural  
336 tube deficiencies low birth weight, preterm delivery, and retardation of fetal growth.

337 Meanwhile, folic acid supplementation lowers the risk of neural tube abnormalities  
338 throughout the periconceptual period (Shulpekova et al., 2021).

339 **Vitamin C deficiency:**

340 Ascorbic acid, or vitamin C, is regarded as an essential nutrient that is particularly  
341 obtained from weight-loss plans; a lack of it can lead to scurvy and alter behavior and  
342 mood. The symptoms of ascorbic acid deficiency include petechiae, ecchymoses, coiled  
343 hairs, hyperkeratosis, arthralgia's, and bleeding gums within the first three months of the  
344 condition. In addition, vitamin C has a major role in the production of carnitine,  
345 catecholamine's, osteoblasts, and osteodentin, as well as in the reduction of folic acid  
346 excretion in the urine and improved absorption of iron from food. Because humans cannot  
347 synthesize vitamin C, they have to depend only on vitamin C-rich vegetables and fruits  
348 for adequate consumption and storage. Citrus fruits, tomatoes, strawberries, potatoes, and  
349 young green vegetables are good sources of vitamin C for your diet. Moreover, growing  
350 toddlers who are exclusively given cow milk or formula, as well as kids with  
351 neurodevelopmental disorders, have deficiencies in vitamin C. It is known that  
352 pharmacological dosages of vitamin C alleviate the symptoms and indicators(Kiani et al.,  
353 2022).

354 **Special Consideration in infants and Toddlers:**

355 Vegetarian's mothers who breastfeed babies or use just soybeans formula can start vegan  
356 diet from birth. The amount of vitamins and minerals in human milk differ based on  
357 becoming mothers. Human milk has amounts of Vitamin A, C, D and B group that are  
358 specifically effected by the food of mother. While vegans regularly take supplements,  
359 nursing mothers may have partially higher level of vitamin. Case studies have been  
360 shown that both breastfeeding babies of vegan mothers and those who are starting to get  
361 show symptoms of Vitamin B12 in sufficiency. Extended Vitamin B12 deficiency can  
362 result in permanent brain impairment due to reduced formation in its most severe form.  
363 To make sure sufficient mothers should take an appropriate supplement containing  
364 Vitamin B12, or babies should receive direct supplementation. Moreover, low mother low  
365 levels of iron vegetarian and vegan mother could lead deficiencies in infants who are  
366 breastfed. Presented a case of severe iron and vitamin B12 insufficiency normally anemia,  
367 hepatosplenomegaly, and development delay in a strong vegan who was not taking any  
368 supplements(Mieliech et al., 2021).

369 Additionally, to receiving a higher chance of becoming deficient may have first sign of  
370 deficiency as previous six months of age, or three months previously than babies born to

371 mothers who have sufficient supplies of iron. Studies have shown that concentration of  
372 docosahexaenoic acid (DHA) in human milk is lower in vegans than in their non-vegan  
373 different forms, increasing worries regarding a possible lack of DHA in milk of vegan  
374 mothers. DHA is essential for young infants developing cells and brains, but its  
375 advantages for term infants are less recognized. Higher early usage has been associated  
376 with improving long term developmental results based on certain studies. Considering  
377 being known that omnivorous mothers had higher DHA than vegan human milk until  
378 recently DHA was not added. Lastly, providing normal soy milk and a vegan diet to  
379 newborns increases their risk of taking in not enough calories. Several vitamins and  
380 minerals found in soy milk are like full milk, but the fat level is closer to that of 2% milk.  
381 The nutritional properties of other milk replacements different whole grains, fruits, and  
382 vegetables are high-fiber foods that are base of vegan diets are abundant but lack  
383 substance in term of energy (Kostecka et al., 2023).

#### 384 **Conclusion:**

385 A particularly organized vegetarian diet can be refreshingly adequate, yet it requires  
386 mindful respect for explicit key enhancements that are found in lower levels in plant-  
387 based food assortments. Vegetarian lovers need to zero in on usage of protein-rich  
388 vegetables, beans, and lentils, vitamin B12-fortified food sources or upgrades, iron-rich  
389 faint blended greens, calcium-reinforced plant-based milk, and vitamin D-rich light  
390 transparency or improvements. Besides, vegetarian darlings should consider omega-3  
391 unsaturated fat upgrades and zinc-rich nuts and seeds to ensure adequate confirmation.  
392 Typical healthy assessment and meeting with a selected dietitian or clinical benefits  
393 provider can help prevent and address potential deficiencies, ensuring a sound and  
394 changed veggie darling eating routine. Vegetarianlovers include calories are at risk for  
395 needs both full scale and little enhancements, including: Full scale supplements: Protein:  
396 Vegetables, beans, and lentils are essential sources. Calcium: Animated plant-based milk  
397 and faint serving of mixed greens are critical. Small scale supplements: Vitamin B12:  
398 Found fundamentally in animal things, supplements or fortified food sources are  
399 significant. Iron: Dull blended greens, beans, and lentils are rich sources, yet  
400 bioavailability may be low. Omega-3 unsaturated fats: Alpha-linolenic destructive (ALA)  
401 in plant-based sources may not give satisfactory EPA and DHA. Zinc: Found in restricted  
402 amounts in many plant-based food sources, phytates may obstruct maintenance. Vitamin  
403 D: Sunshine receptiveness, supplements, or supported food sources are basic, especially  
404 in regions with limited light. Iodine: Iodized salt and kelp are basic sources. Typical use

405 of a variety of whole, plant-based food assortments and considered improvements or  
406 reinforced food assortments can help with directing these needs and assurance a  
407 refreshingly palatable vegetarian diet.

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