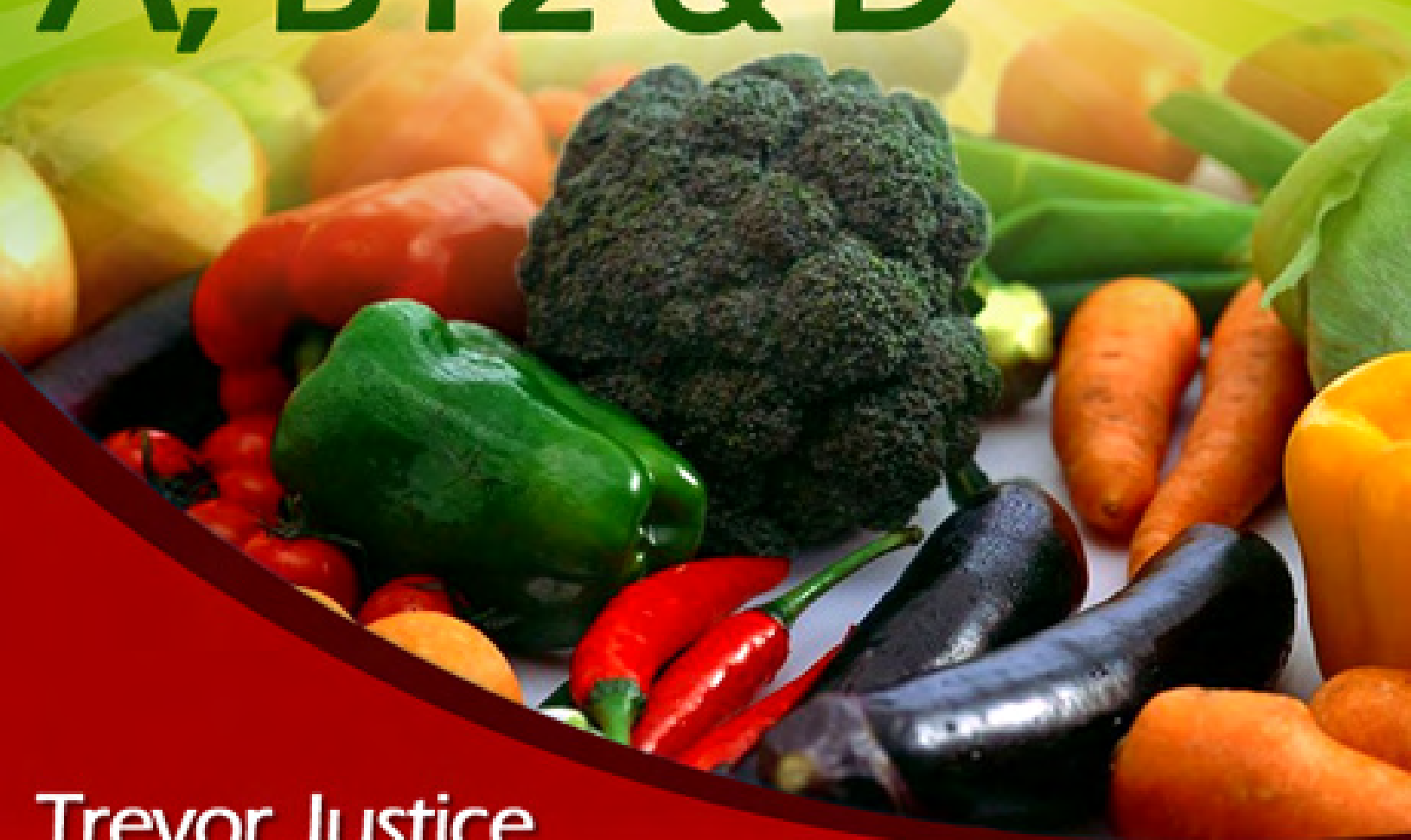


HOW
Vegetarians

Get Calcium,



**Iron, Protein,
A, B12 & D**



Trevor Justice



How Vegetarians Get Protein, Calcium, Iron, Vitamins A, B12 & D

Introduction by Trevor Justice, Owner/Director

I still remember that moment in 2009. I was at a vegetarian potluck with author Michael Klaper, M.D. At a certain point, someone asked about Lierre Keith.

During her 20 years as a vegetarian, Lierre's health got worse. After adding meat back to her diet, she felt rejuvenated and condemned the vegetarian diet in her book, [The Vegetarian Myth](#). My heart sinks when I hear stories like this.

But there's a reason vegetarians fail. Dr. Klaper explained it this way:

Without the right game plan for meeting your nutritional needs, a plant based diet has real pitfalls. That's why Lierre, and others like her, develop health problems.

Getting these nutrients on a plant based diet is entirely possible. It's what we teach. But you can't go about it haphazardly, like my friends and I did early on.

We began attending vegetarian and raw food conferences 15 years ago. When the speakers told us that eating whole foods was a cure-all, we took them at their word.

When they touted the health benefits of vegetarianism – with little mention of the risks – we became overconfident. After all, our risk of high blood pressure, cholesterol, and heart disease was dramatically lower. So surely we were invincible, right?

With this false confidence, we took our health for granted. We rolled our eyes when omnivorous relatives worried about us. But eventually, some of us suffered health problems.

Dr. Klaper impresses me because he doesn't just harp on the benefits of the vegetarian diet. (There are many!) He also acknowledges the pitfalls. For example, Vitamins like B12 and D are harder to find in plant foods, and nutrients like iron and Vitamin A are harder to absorb. So you need a game plan.

First, know which foods are high in these nutrients. Second, eat them in the right combinations to maximize absorption. And third, avoid foods, beverages, and drugs that keep your body from absorbing them.

We created this booklet to accomplish two things:

- 1) To show you which foods are high in these critical nutrients.
- 2) To give you a taste of what's waiting for you in The Vegetarian Mastery Program.

In 2009, I founded The Vegetarian Health Institute and teamed up with Dr. Klaper (and other experts) to create The Vegetarian Mastery Program. It's a series of 50 lessons that teach you step-by-step how to thrive on a vegetarian diet.

Each lesson contains a written component and a recorded Q&A call with a guest expert. Dr. Klaper is the expert I interview most often. He also authored all of our lessons on vitamins and minerals. Our program is also packed with life-saving secrets from Registered Dietitians, and the authors of top vegetarian cookbooks and nutrition books.

[Click here](#) to learn more about The Vegetarian Mastery Program. Or [click here](#) to get our free 10-day email course (if you haven't already signed up).

CALCIUM

The plant foods highest in calcium are leafy greens like spinach, kale, and turnip greens. However, the food industry fortifies many staple foods with calcium – including orange juice, soy milk, tofu, and breakfast cereals.¹ This helps ensure that we all get enough.

Does this mean you don't have to worry about calcium? Not necessarily. As Dr. Klaper likes to say, "You're not what you eat. You're what you absorb."

So What Interferes With Calcium Absorption?



Select Plant Sources Of Calcium

Food	Serving size	Calcium in standard portion (mg)	Calcium per 100 grams (mg)
Tofu, firm, made with calcium sulfate, raw	½ cup	434	350
Orange juice, calcium fortified	6 ounces	375	201
Soybeans, cooked	1 cup	261	145
Blackstrap Molasses	1 Tbsp	200	183
Tempeh	1 cup	184	111
Collard greens, boiled	½ cup	133	140
Tahini	2 Tbsp	128	426
Okra, cooked	1 cup	123	77
Spinach, boiled	½ cup	122	136
Instant breakfast drink, various, with water	8 ounces	105-250	285
Turnip greens, raw	1 cup	104	190
Ready to eat cereal, calcium fortified	1 cup	100-1000	357-3571
Turnip greens, boiled	½ cup	99	137
Kale, cooked	1 cup	94	72
Kale, raw	1 cup	90	135
Almonds	¼ cup	94	264
Almond butter	2 Tbsp	111	347
Soy milk, calcium fortified	8 ounces	340	140
Soy yogurt	6 ounces	300	132
Chinese cabbage, boiled	½ cup	79	93
Chinese cabbage, raw	1 cup	74	105

Sources: Report of the DGAC on the Dietary Guidelines for Americans, 2010, The Vegetarian Resource Group.

Select Animal Sources Of Calcium

Food	Serving size	Calcium in standard portion (mg)	Calcium per 100 grams (mg)
Plain yogurt, nonfat	8 ounces	452	199
Romano cheese	1.5 ounces	452	1064
Pasteurized process Swiss cheese	2 ounces	438	772
Evaporated milk, nonfat	½ cup	371	290
Plain yogurt, low-fat	8 ounces	415	183
Fruit yogurt, low-fat	8 ounces	345	152
Ricotta cheese, part skim	½ cup	337	272
Swiss cheese	1.5 ounces	336	791
Pasteurized process American cheese food	2 ounces	323	570
Provolone cheese	1.5 ounces	321	756
Mozzarella cheese, part-skim	1.5 ounces	311	731
Cheddar cheese	1.5 ounces	307	721
Muenster cheese	1.5 ounces	305	717
Low-fat milk (1%)	1 cup	305	125
Skim milk (nonfat)	1 cup	299	122
Reduced fat milk (2%)	1 cup	293	120
Low-fat chocolate milk (1%)	1 cup	290	116
Low-fat buttermilk (1%)	1 cup	284	116
Whole chocolate milk	1 cup	280	112
Whole milk	1 cup	276	113

Sources: Report of the DGAC on the Dietary Guidelines for Americans, 2010, The Vegetarian Resource Group.

Here are two factors that impede calcium absorption:

1) Phytic Acid occurs naturally in the bran of whole grains, nuts, seeds, soy isolates, and the skins of legumes. It's particularly rich in isolated wheat bran.² It binds to minerals like calcium, magnesium, iron, and zinc in your intestines to form an insoluble complex, interfering with the absorption of these minerals.³

2) Oxalic Acid. Oxalic acid occurs naturally in many plant foods. When oxalic acid and calcium are contained in the same food, it binds to the calcium and forms less soluble salts known as oxalates. This interferes with absorption. It has the same affect on iron, sodium, magnesium, and potassium, when contained in the same food. The more oxalic acid, the more interference.²

Some calcium rich foods high in oxalates are almonds, beets, cocoa, miso, mixed nuts, sesame seeds, spinach, and Swiss chard.⁴

In lesson 3 of the Vegetarian Mastery Program -- ***“How To Absorb More Calcium From Your Meals”*** – you’ll discover:

- Which foods contain high, moderate, and low amounts of oxalic acid
- How to release oxalic acid from your food, so you absorb more calcium from your meals
- Six ways to release phytic acid during food preparation
- Which foods, condiments, and drugs inhibit calcium absorption.
- The latest RDA for men, women, children, and pregnant and breastfeeding mothers
- Quick, delicious recipes high in both calcium and a complimentary nutrient that supercharges calcium absorption, so you absorb more calcium now and for the rest of your life. For example:
 - Lemony Lentil and Potato Chowder »
 - Blanched Spinach with Toasted Sesame Dressing »
 - Black-Eyed Peas & Spinach »
 - Bean & Vegetable Soup »

You’ll also get a downloadable 1-hour Q&A of Michael Klaper, M.D, answering student questions.

IRON

Iron-rich plant foods include raisins, soybeans, lentils, kidney beans, spinach, collards, pumpkin seeds, oat cereal, and quinoa.¹

Unlike the “heme” iron in flesh foods, only 10% – 20% of the non-heme iron in plant foods gets absorbed by your body.⁵ (And neither eggs nor dairy contain iron.)

The good news is this. There are three “magic” food combinations that dramatically enhance iron absorption from vegetarian foods!



Select Plant Sources Of Iron

Food	Serving size	Iron in standard portion (mg)	Iron per 100 grams (mg)
Tempeh	1 cup	4.5	2.7
Soybeans, mature, cooked	½ cup	4.4	5.1
Fortified ready-to-eat cereals (various)	¾ -1- ½ cup (~1 ounce)	4.2-18.1	8.2-62.0
White beans, canned	½ cup	3.9	3.0
Fortified instant cereals (various)	1 packet	3.8-17.2	2.5-6.7
Blackstrap Molasses	1 Tbsp	3.6	2.4
Tofu, raw, firm	½ cup	3.4	2.7
Lentils, cooked	½ cup	3.3	3.3
Potato, baked	1 large	3.2	1.1
Quinoa, cooked	1 cup	2.8	1.6
Tahini	2 Tbsp	2.7	9.0
Chickpeas, cooked	½ cup	2.4	2.9
Pumpkin and squash seed kernels, roasted	1 ounce	2.3	8.1
Soybeans, green, cooked	½ cup	2.3	2.5
Lima beans, cooked	½ cup	2.3	2.4
Navy beans, cooked	½ cup	2.2	2.4
Black-eyed peas, cooked	½ cup	2.2	2.5
Cashews, dry roasted	¼ cup	2.1	6.0
Swiss chard, cooked	½ cup	2.0	2.3
Kidney beans, cooked	½ cup	2.0	2.2

Sources: Report of the DGAC on the Dietary Guidelines for Americans, 2010, The Vegetarian Resource Group, and manufacturers’ information.

For example, lacto fermented vegetables -- like sauerkraut -- enhance iron absorption when combined with iron rich foods.⁶ (The secret is the lactic acid.)

Once you know all three iron-enhancing food groups, you can combine any of them with iron-rich foods and instantly absorb more iron.

In Lesson 7 of the Vegetarian Mastery Program -- ***“How to Absorb More Iron From Your Meals”*** – you’ll discover:

- Which other food combinations make the iron in your meals more absorbable
- Which food prep methods release iron-blockers from whole grains, nuts, seeds, and legumes.
- Which foods, beverages, and over-the-counter drugs impede iron absorption.
- The latest RDA for men, women, children, and pregnant and breastfeeding mothers

➤ Delicious recipes that employ the food combinations referenced above, so you absorb more iron now and for the rest of your life. Here are a few of the mouth-watering recipes you’ll receive:

- Greens Sushi »
- Lemon-Rosemary Tempeh »
- Spicy Thai Wraps »
- Spinach Salad With Orange-Tahini Dressing »
- Nomi’s Smoothie »
- Spinach Puree »
- Orange-Cashew Crème »
- Greens Braised with Tomatoes and Thyme »
- Kale and Potato Smash »
- Spinach with Warm Lentils »

You’ll also get a downloadable 1-hour Q&A of Michael Klaper, M.D, answering student questions.

PROTEIN

Protein is made up of 22 amino acids. However, you only need nine of them from food. These are called the essential amino acids (EAAs). Your body can create the others.⁷

Most plant foods have all of the essential amino acids, but the amounts of one or two amino acids are low. For example, while grains are low in lysine, legumes are low in methionine.⁷ That’s why omnivores make such a “hub bub” about protein.

Decades ago, the book Diet For A Small Planet led us to believe that beans and grains had to be combined in the same meal. But the book’s author later retracted that statement!

When you eat a well rounded diet of whole foods, you’re almost certain to get all nine EAAs in the course of a day. For example, you can eat beans with lunch and grains with dinner.

That said, many vegetarians still find it comforting to include whole proteins in their diets. Well here’s great news. Eggs, milk, soybeans, soy “meats”, tofu, quinoa, and spinach are high in all 9 essential amino acids.⁷ How much protein do you need?

The RDA recommends consuming 0.8 grams of protein for every kilogram you weigh (or 0.36 grams of protein per pound you weigh).⁸

If you primarily eat whole foods, however, we recommend increasing that to 1 gram of protein per kilogram of body weight (or 0.45 grams of protein per pound that you weigh). Why?

The protein in whole, unprocessed plant foods is not entirely digestible.

For example, the protein in whole soybeans has a digestibility score of 78%, whereas the protein from



isolated soy protein, soy “meats”, tofu, and other soy foods is in the 90-98% range. Likewise, refined wheat protein is more digestible than the protein in whole wheat berries.⁹

This is ironic, since we normally recommend whole foods, *not* their processed counterparts (which are stripped of vitamins and minerals)! But the solution is simple: if you eat mostly whole foods, increase your protein intake to 1 gram per kilogram of body weight.

We’ve just scratched the surface here. In lesson 14 of the Vegetarian Mastery Program -- ***“Six Ways to Get Plenty of Protein”*** – you’ll discover:

- The dangers of eating too much protein
- How to “transform” beans so they never cause gas, bloating, or indigestion.
- Which protein sources we discourage eating and why
- The six vegetarian food groups highest in protein
- The latest RDA for men, women, children, and pregnant and breastfeeding mothers
- Delicious high protein recipes like these, most of which are soy-free:
 - Tuscan White Bean Soup »
 - Curried Lentils and Rice »

- Black Bean Quinoa Burgers »
- Hearty Cabbage Casserole »
- Heirloom Bean & Vegetable Soup »
- Faux Salmon (almond-based) »
- Sun Garden Burgers »
- Blanched Spinach with Toasted Sesame Dressing »

- Kale with Orange-Tahini Dressing »

You'll also get a downloadable 1-hour Q&A of Vesanto Melina, R.D., answering student questions. Vesanto is a Registered Dietitian and author or co-author of six nutrition books, including *Becoming Vegetarian*, *Becoming Vegan*, and *Becoming Raw*.

Select Plant Sources Of Protein

(Italicized foods are high in all 9 essential amino acids.⁷⁾

Food	Serving size	Protein in standard portion (mg)	Protein per 100 grams (mg)
<i>Soybeans, mature, cooked</i>	1 cup	28.6	16.6
<i>Soybeans, immature, cooked (edamame)</i>	1 cup	22.2	12.4
Vegetarian burger crumbles	1 cup	22.2	20.1
Couscous, dry	1 cup	22.1	12.8
<i>Tofu, raw, regular, prepared w/calcium sulfate</i>	1 cup	20	8.1
Barley, pearled, raw	1 cup	19.8	9.9
White beans, canned	1 cup	19.0	7.3
Lentils, cooked	1 cup	17.9	9.0
Bulgur, dry	1 cup	17.2	12.3
Split peas, cooked	1 cup	16.4	8.3
Oat bran, raw	1 cup	16.3	17.3
Pinto beans, cooked	1 cup	15.4	9.0
Kidney beans cooked	1 cup	15.4	8.7
Black beans, cooked	1 cup	15.2	8.9
<i>Quinoa, cooked</i>	1 cup	8.1	4.4
Pumpkin and squash seed kernels, roasted, with salt added	1 oz (142 seeds)	9.4	33.0
Peanuts, all types, dry-roasted, with salt	1 oz (28 nuts)	6.7	23.7
Sunflower seed kernels, dry roasted, with salt added	¼ cup	6.2	21.8
Pistachio nuts, dry roasted, with salt added	1 oz (47 nuts)	6.0	21.3
Almonds	1 oz (24 nuts)	6.0	21.3
<i>Spinach, boiled</i>	1 cup	5.4	3.0
<i>Spinach, raw</i>	1 cup	0.9	2.9

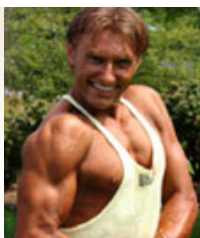
Source: USDA National Nutrient Database for Standard Reference, 2010, Release 23.

Select Animal Sources Of Protein

(Including flour products made with eggs or dairy)

Food	Standard portion size	Protein in standard portion (mg)	Protein per 100 grams (mg)
Cottage cheese, 2%	1 cup	31.0	13.7
Cheese, ricotta, part skim	1 cup	28.0	11.4
Condensed milk, sweetened	1 cup	24.2	7.9
Yogurt, plain, skim	8 ounces	13.0	5.7
Milk shake, vanilla	11 ounces	12.1	3.6
Eggnog	1 cup	9.7	3.8
White sauce, homemade	1 cup	9.6	3.8
Milk, nonfat, fortified	1 cup	8.3	3.4
Buttermilk, lowfat	1 cup	8.1	3.3
Milk, whole	1 cup	7.9	3.2
Swiss cheese	1 ounce	7.6	26.9
Egg noodles, cooked	1 cup	7.6	4.8
Mozzarella cheese, part skim	1 ounce	7.4	26.0
Egg, whole, raw	1 extra large	7.3	12.6
Cheddar cheese	1 ounce	7.1	30.0
Egg, whole, cooked	1 large	6.3	12.6
Pudding, vanilla	½ cup	4.1	2.9
Muffin	1 muffin	3.7	6.5

Source: USDA National Nutrient Database for Standard Reference, 2010, Release 23.



Note that athletes need more calories and protein than other people, especially when working out causes micro-tears in their muscles.

That's why we enlisted Robert Cheeke to write Lesson 19 of The Vegetarian Mastery Program, "Building Muscle". Robert also answered student questions on the related Q&A call. Robert is a champion bodybuilder, and he's hailed as "one of the 15 most influential vegan athletes" by VegNews Magazine.

VITAMIN A

Plant foods don't contain active Vitamin A. They contain its pre-cursor, beta-carotene. Beta carotene is 1/12 as potent as retinol, the active Vitamin A in animal foods.¹⁰

Foods rich in beta carotene include broccoli, dark leafy greens like spinach, collards, and kale, carrots, yams, pumpkin, sweet potatoes, cantaloupe, apricots, papaya, mango, and peaches.¹



Select Plant Sources Of Beta Carotene (Pro Vitamin A)

(Measured in Retinol activity equivalents. One RAE equals 12 mcg of beta-carotene)

Food	Serving size	Vitamin A in standard portion (mcg RAE)	Vitamin A per 100 grams (mcg RAE)
Carrot juice	1 cup	2256	956
Sweet potato, baked	1 medium	1096	961
Pumpkin, cooked from fresh or canned	½ cup	306-953	250-778
Carrots, cooked from fresh, frozen, or canned	½ cup	407-665	558-852
Spinach, cooked from fresh, frozen, or canned	½ cup	472-573	490-603
Kale, raw	1 cup	515	769
Carrot, raw	½ cup	509	835
Collards, cooked from fresh or frozen	½ cup	386-489	406-575
Kale, cooked from fresh or frozen	½ cup	443-478	681-735
Mixed vegetables, cooked from frozen or canned	½ cup	195-475	214-583
Turnip greens, cooked from fresh or frozen	½ cup	274-441	381-538
Turnip greens, raw	1 cup	318	579
Fortified instant cereals (various)	1 packet	318-376	186-265
Fortified ready-to-eat cereals (various)	¾ - 1 ¼ cup (~1 ounce)	177-307	442-991
Mustard greens, raw		294	525
Dandelion greens, raw	1 cup	279	508
Beet greens, cooked from fresh	½ cup	276	383
Winter squash, cooked	½ cup	268	261
Mustard greens, cooked from fresh	½ cup	221	316
Romaine lettuce	1 cup	205	436

Source: Report of the DGAC on the Dietary Guidelines for Americans, 2010

Select Animal Sources of Retinol (active Vitamin A)

Food	Serving size	Milligrams retinol per serving
Milk, low fat	1 cup	0.87
Milk, whole	1 cup	0.72
Butter	1 Tbsp	0.65
Egg, scrambled	1 egg	0.6
Cheese (cheddar, cottage, muenster, American)	1 oz	0.52
Egg, hard boiled	1 egg	0.47
Yogurt, plain whole	8 oz	0.41

Source: Report of the DGAC on the Dietary Guidelines for Americans, 2010.

If you don't consume dairy, plant foods will be your primary source of Vitamin A.

Since beta carotene is the precursor to Vitamin A, it might seem like you could get enough Vitamin A just by eating beta carotene foods. But the rate of conversion to Vitamin A isn't guaranteed. Although your body is designed to turn beta carotene into Vitamin A, two things can affect this conversion process:

- 1) The beta carotene in vegetables is hard to absorb, especially those with tough cell walls.¹¹
- 2) Few people eat beta carotene together with the nutrients that supercharge Vitamin A production (when combined with beta carotene foods).

Here's the good news. There are three food prep techniques that break down the cell walls in vegetables, making beta carotene easier to absorb. Cooking is one of them.¹¹ The other two will be a Godsend if you eat lots of raw vegetables.

In lesson 13 of the Vegetarian Mastery Program -- "**How to Convert More Beta Carotene Into Active Vitamin A**" -- you'll discover:

- Which three food prep techniques break open the cell walls in vegetables, making their beta carotene easier to absorb
- Which two nutrients supercharge the conversion of beta-carotene into Vitamin A, when you eat them at the same time

- The latest RDA for men, women, children, and pregnant and breastfeeding mothers
- Delicious recipes that employ the food combinations referenced above, so you convert far more beta carotene into Vitamin A now and for the rest of your life. For example:

- Basil-Red Pepper Sauce »
- Zucchini Chedda Soup »
- Curried Cashew Crème Sauce »

- Sesame Ginger Kale »
- Sweet Potato and Cashew Korma with Rice »

You'll also get a downloadable 1-hour Q&A of Michael Klaper, M.D, answering student questions.

Recipes in cookbooks are only designed to taste great. But what about nutrients – like iron and Vitamin A -- that are harder to absorb from plant foods? Our recipes aren't just delicious. They follow the life-saving food combinations we teach. So you absorb far more vitamins and minerals.



VITAMIN B12

The medical literature brims with case studies of vegetarians -- infants, children, adults, and the elderly -- who've incurred bodily damage from B12 deficiency.¹²

The most reliable plant sources of B12 are supplements and B12-fortified foods. These include cereals, non-dairy milks, Red Star nutritional yeast, and "meats" made from wheat gluten or soybeans).¹³

Since the RDA for adults is 6.0 mcg, the amount of B12 in dairy products is respectable. One cup of 2% milk contains 1.29 mcg while 8 ounces of yogurt contains 1.27 mcg.¹

However, unless you consume more than a quart of milk each day, dairy alone won't fulfill your requirements. The supplement we recommend is called "Gentle Care". It contains 30 mcg of Vitamin B12, which is 500% of the US RDA. It's available at www.veganmultivitamin.com



Select Plant Sources Of Vitamin B12

Food	Standard portion size	Vitamin B12 in standard portion (mcg)	Vitamin B12 per 100 grams (mcg)
Gentle Care Formula	2 capsules	30	n/a
Red Star nutritional yeast	1 Tbsp	5.2	48.8
Vegetarian burger crumbles, frozen	1 cup	4.5-9.13	8.3-12.9
Fortified breakfast cereals (various)	¾ - 1½ cup (~1 ounce)	1.5-20.7	2.7-6.0
Fortified soy milk, fortified	1 cup	3.0	1.1
Fortified rice milk, unsweetened	1 cup	1.51	0.63

Sources: Report of the DGAC on the Dietary Guidelines for Americans, 2010, manufacturers' information.

Select Animal Sources Of Vitamin B12

Food	Standard portion size	Vitamin B12 in standard portion (mcg)	Vitamin B12 per 100 grams (mcg)
Cheese, cottage, 1%	1 cup	1.42	0.63
Plain yogurt, nonfat	8 ounces	1.38	0.61
Reduced fat milk (2%)	1 cup	1.29	0.53
Plain yogurt, low-fat	8 ounces	1.27	0.56
Skim milk (nonfat)	1 cup	1.23	0.5
Swiss cheese	1 cup	0.95	0.77
Eggs	1 large	0.45	0.9

Sources: Report of the DGAC on the Dietary Guidelines for Americans, 2010, manufacturers' information.

In Lesson 9 of the Vegetarian Mastery Program -- "**The Truth About Vitamin B12**" -- you'll discover:

- When nutritional yeast has less B12 than it claims to
- How much B12 is in fermented soy products, amesake rice, umeboshi prunes, and the soil on unwashed veggies
- Which foods are purported to be good B12 sources, but actually block the absorption of **active** B12...

causing B12 deficiency.

- How to know if you're deficient in B12
- The latest RDA for men, women, children, and pregnant and breastfeeding mothers
- A mouth watering recipe for a Nutritional Yeast Gravy.

You'll also get a downloadable 1-hour Q&A of Michael Klaper, M.D, answering student questions.



“I’ve been a vegan/macrobiotic cookbook author, food coach and speaker for 37 years. Yet I continue refining my understanding of nutrition, thanks to the broad range of experts Trevor brings to the Q&A calls. My interest in sprouting and juicing has been renewed, and the insights shared on bone health and Vitamins D and B12 have been revelatory.”

– Meredith McCarty, Mill Valley, CA

VITAMIN D

Not long ago, we believed most people could get adequate vitamin D from sunlight. On this basis, the USDA recommended the following daily intake for both men and women:

Birth to 50 years:	5 mcg (200 IU)
51-70 years:	10 mcg (400 IU)
71+ years:	15 mcg (600 IU)

In recent years, however, we’ve realized the limited power of the sun to produce adequate vitamin D levels. While the “official” dosage recommendations have yet to be revised upward by the U.S. government, here’s what we are recommending now:

For infants/children: 400 IU daily.¹⁴

For men and women: 1000 – 2000 IU daily.¹⁵

In their natural form, only two plant foods contain vitamin D: algae and mushrooms. (But the amounts are small.) Even a cup of unfortified milk only contains 9-17 IU of Vitamin D3.¹ That’s just a small fraction of your daily requirements.

The problem isn’t limited to vegetarians. Even many omnivores are at risk for Vitamin D deficiency. This a huge concern because your body needs vitamin D to absorb calcium, and build and maintain strong bones.

Fortification To The Rescue

For these reasons, it’s become common practice to “fortify” milk, yogurt, orange juice, breakfast cereals, and other staple foods with vitamin D3.

For omnivores, this is no problem. But if you’re a vegetarian, you may be alarmed to know that Vitamin D3 can come from sheep wool lanolin, pig skin, or cow skin.¹⁶ And here’s the clincher...

There’s no law requiring food manufacturers to indicate the source of the D3 in their foods. There couldn’t be. That’s because after D3 is extracted, purified, and crystallized, it’s impossible to determine the original source.¹⁶ But there are two pieces of good news:



- 1) Most non-dairy milks are fortified with plant-based Vitamin D2. 1 cup of fortified soy / rice / almond / oat milk typically contains 100 IU.¹
- 2) When Portabello mushrooms and white “button” mushrooms are briefly exposed to intense ultraviolet light, their naturally-occurring ergosterol is activated to vitamin D2 (ergocalciferol) in quite significant amounts.¹⁷ 3 ounces of UV-exposed mushrooms contain 1520 IU!¹⁸ You can find these at most health food stores.

What about eggs and dairy? The average egg yolk contains 25 IU (0.7 mcg) of Vitamin D.

1 cup of unfortified milk contains 8 IU (0.2 mcg) of Vitamin D3. 1 cup of **fortified** milk contains 124 IU (3.2 mcg) of Vitamin D3. As mentioned above, milk and yogurt are typically fortified with Vitamin D3, which can come from the skin of cows or pigs.

Even if that doesn’t concern you, you’d have to drink about two **quarts** of fortified milk each day to meet the RDA (which we don’t recommend).

So how can adults get 1000 IU daily? You can make UV-exposed mushrooms a staple in your daily diet. Or you can take a supplement like “Gentle Care Formula”. It contains 1,000 IU of Vitamin D2 and 30 mcg of B12. It’s available at www.veganmultivitamin.com

Select Plant Sources Of Vitamin D

Food	Standard portion size	Vitamin D in standard portion (mcg)	Vitamin D per 100 grams (mcg)
Gentle Care Formula	2 capsules	25	n/a
UV-exposed Portabello mushrooms	1 cup	9.6	11.2
Soymilk, fortified with plant based D2	1 cup	2.7	1.1
Fortified ready-to-eat cereals, typically fortified with animal based D3	¾ - 1 ¼ cup (~1 ounce)	0.9-2.5	2.9-8.3
Rice milk, fortified with plant based D2	1 cup	2.4	1.0
Orange juice, fortified with animal based D3	½ cup	1.7	1.4
Shiitake mushrooms (not UV exposed)	½ cup	0.6	0.8

Source: Report of the DGAC on the Dietary Guidelines for Americans, 2010.

Select Animal Sources Of Vitamin D

Food	Standard portion size	Vitamin D in standard portion(mcg)	Vitamin D per 100 grams (mcg)
Whole milk fortified with Vitamins A and D3	1 cup	3.2	1.3
Milk (nonfat, 1% and 2%) fortified with A and D3	1 cup	2.9	1.2
Evaporated milk, nonfat	½ cup	2.6	2
Yogurt, fruit, low fat, fortified with vitamin D3	1 cup	2.2	1.3
Egg, hard-boiled	1 large	0.7	1.3
Whole milk (unfortified)	1 cup	0.2	0.1
Yogurt, fruit, low fat (unfortified)	1 cup	0	0

Source: Report of the DGAC on the Dietary Guidelines for Americans, 2010.

In lesson 11 of the Vegetarian Mastery Program --

“The Truth About Vitamin D” – you’ll discover:

- Which other foods are fortified with plant-based Vitamin D
- How Vitamin D partners with calcium to keep your bones strong
- Why you probably get less Vitamin D from the sun than once believed
- How to know if you’re deficient in Vitamin D

- The latest RDA for men, women, children, and pregnant and breastfeeding mothers
- Delicious ways to prepare UV-exposed mushrooms including:
 - Hungarian Mushroom Soup
 - Marinated Mushrooms
 - Portobello Mushroom Burgers

You’ll also get a downloadable 1-hour Q&A of Michael Klaper, M.D, answering student questions.

OMEGA 3s

Flax seeds, hemp seeds, walnuts, and their respective oils are the best sources of alpha-linolenic acid (ALA), a short chain Omega-3 fatty acid.

But your body also needs two long chain Omega-3 fatty acids: EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). So how do you get those?

Unfortunately, EPA and DHA are almost non-existent in plant foods. No wonder studies have found that blood levels of EPA and DHA are lower in vegetarians than in meat-eaters.^{19 20}

There’s one exception: algae. In fact, if you want to take DHA in supplement form, Dr. Joel Fuhrman makes the case that algae based DHA is superior to fish oil. Why?

Most fatty fish contain potentially harmful pollutants, such as dioxin and mercury. People also experience burping and indigestion from these oils because of the fishy taste and foul odor.



The algae-based DHA we recommend is here: <http://www.bestvegandha.com>

But what if you don’t take DHA supplements? Can your body can convert ALA to EPA and DHA?

It’s *possible*. However — and this is a BIG “however” — the rate of conversion is low in women and very low in men.²¹ Why?



The modern American diet is loaded with oils that are high in Omega 6 fatty acids.

Sure, you need Omega 6's in your diet. But the optimal ratio of Omega 6 to Omega 3 is about 1:1 (an equal amount of both).²² Many oils have terrible ratios. For example, corn oil has a 57:1 ratio and safflower oil has a

76:1 ratio (in favor of Omega 6)!²³

If you eat processed foods, packaged foods, or restaurant foods made with the wrong oils, this Omega 6:3 imbalance can interfere with DHA and EPA production in your body... even if you eat plenty of flax seeds and walnuts.²⁴

Select Plant Sources Of Alpha Linolenic Acid

Food	Standard portion size	ALA in standard portion (mg)	ALA per 100 grams (g)
Walnuts	¼ cup	2,270-2,700	9.1-10.8
Flaxseed oil	1 tsp	2,400	53.3
Peanut butter containing flaxseed oil	2 Tbsp	1,000	1.0
Kashi Go Lean Crunch!, Honey Almond Flax	1 cup	122	0.2
Whole Flaxseeds	1 tsp	900	26.5
Soy nuts	¼ cup	620	1.4
Chia seeds	1 tsp	800	17.6
Flaxseed, ground	1 tsp	570	22.8
Soybeans, cooked	½ cup	514	0.6
Walnut oil	1 tsp	470	10.4
Canola oil	1 tsp	400	8.9
Unshelled hemp seeds	1 tsp	333	10
Broccoli, raw	1 cup	300	0.3
Soybean oil	1 tsp	300	6.7
Pecans	¼ cup	240	0.9
Tofu	½ cup	228	0.2
Soymilk	1 cup	210	0.1
Collards, raw	1 cup	200	0.6
Broccoli, cooked	1 cup	190	0.1
Cabbage, cooked	1 cup	165	0.1

Sources: Report of the DGAC on the Dietary Guidelines for Americans, 2010, The Vegetarian Resource Group, manufacturers' information.

Select Animal Sources Of Alpha Linolenic Acid

Food	Standard portion size	ALA in standard portion (mg)
Yogurt, low fat	8 ounces	600
Omega 3 Eggs, Organic Valley	1 large	225
Cheese, Cheddar	1 ounce	200
Milk, whole, fortified	8 ounces	200
Cream cheese	2 Tbsp	100
Regular eggs, whole, cooked	1 large	39

Sources: Report of the DGAC on the Dietary Guidelines for Americans, 2010, manufacturers' information.

In lesson 5 of the Vegetarian Mastery Program -- ***“How to Convert ALA (the Plant-Based Omega 3) into EPA and DHA”*** – you’ll discover:

- Which foods and oils interfere with your body’s ability to make DHA and EPA.
- How to maximize DHA and EPA production.
- The latest RDA for men, women, children, and pregnant and breastfeeding mothers
- A chart showing the Omega 6:3 ratios of 18 different oils.

- A delicious recipe for a Lemon-Flax Oil Vinaigrette that you can use in place of commercial salad dressings... and skyrocket your daily intake of ALAs.

You’ll also get a downloadable 1-hour Q&A of Michael Klaper, M.D, answering student questions.

Did you find this booklet helpful? If so, why stop here? We’ve only scratched the surface. [Click here](#) to learn more about The Vegetarian Mastery Program. Or [click here](#) to get our free 10-day email course (if you haven’t already signed up).

- 1 USDA Report of the Dietary Guidelines Advisory Committee (DGAC) On The Dietary Guidelines for Americans, 2010, Part D, Section 2: Nutrient Adequacy
- 2 The Encyclopedia of Nutrition and Good Health, 2nd Edition, Robert Ronzio, PhD, 2005, Checkmark Books, p513.
- 3 Robert Ronzio, PhD, The Encyclopedia of Nutrition and Good Health, 2nd Edition. Checkmark Books, 2005, p513.
- 4 Andrew Weil, M.D., DrWeil.com, "Avoid Vegetables With Oxalic Acid?", <http://www.drweil.com/drw/u/QAA400344/Avoid-Vegetables-with-Oxalic-Acid.html> , January 2008
- 5 The Vegetarian Mastery Program, Lesson 7.1, "How To Absorb More Iron From Your Meals". Michael Klaper, M.D.
- 6 Int J Vitam Nutr Res. 2004 Nov;74(6):403-19. Enhancers of iron absorption: ascorbic acid and other organic acids.
- 7 Reed Mangels, Ph.D, RD, Protein in the Vegan Diet, <http://www.vrg.org/nutrition/protein.htm>
- 8 Food and Nutrition Board, Institute of Medicine. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Washington, DC: National Academy Press, 2002.
- 9 Becoming Vegan p44
- 10 Michael Klaper, M.D. The Vegan / Vegetarian Mastery Program, Lesson 13.1: How To Maximize The Conversion of Beta Carotene into Active Vitamin A.
- 11 Forum Nutr. 2009;61:55-63. Epub 2009 Apr 7. Absorption and function of dietary carotenoids. Nagao A. National Food Research Institute, National Agriculture and Food Research Organization, Tsukuba, Japan. nagao@affrc.go.jp
- 12 Ashkenazi S, Weitz R, Varsano I, Mimouni M. Vitamin B12 deficiency due to a strictly vegetarian diet in adolescence. *Clinical Pediatrics* 1987;26(Dec):662-663. Brants HA, Lowik MR, Westenbrink S, Hulshof KF, Kistemaker C. Adequacy of a vegetarian diet at old age (Dutch Nutrition Surveillance System). *J Am Coll Nutr* 1990 Aug;9(4):292-302. Dwyer JT, Dietz WH Jr, Andrews EM, Suskind RM. Nutritional status of vegetarian children. *Am J Clin Nutr* 1982 Feb;35(2):204-16.
- 13 Michael Klaper, M.D. The Vegan / Vegetarian Mastery Program, Lesson 9.1: The Truth About Vitamin B-12. December 2009
- 14 Am J Clin Nutr. 2008 Aug;88(2):529S-533S. 25-Hydroxyvitamin D: functional outcomes in infants and young children. Greer FR. Department of Pediatrics, University of Wisconsin, Madison, WI, USA. frgreer@pediatrics.wisc.edu
- 15 Bischoff-Ferrari, HA et al. Fracture prevention with vitamin D supplementation *JAMA* 200(18)5;293.2257-2264 Fuhrman, J Healthy Times newsletter, No.39; Winter 2009
- 16 Professor Anthony W. Norman, December 2000, "How is vitamin D produced commercially for food supplementation?", Department of Biochemistry & Biomedical Sciences, University of California, Riverside CA 92521
- 17 J Agric Food Chem. 2009 Apr 22;57(8):3351-5. Vitamin D2 formation and bioavailability from *Agaricus bisporus* button mushrooms treated with ultraviolet irradiation. Koyyalamudi SR, Jeong SC, Song CH, Cho KY, Pang G. Centre for Plant and Food Science, College of Health and Science, University of Western Sydney, Penrith South DC, NSW 1797, Australia. J Agric Food Chem. 2009 Apr 22;57(8):3351-5. Western Regional Research Center, Agricultural Research Service, United States Department of Agriculture, 800 Buchanan Street, Albany, California 94710, USA Br J Nutr. 2005 Jun;93(6):951-5. Bioavailability of vitamin D2 from irradiated mushrooms: an in vivo study. Jasinghe VJ, Perera CO, Barlow PJ. Department of Chemistry, Food Science & Technology Programme, National University of Sin, 3 Science Drive 3, Singapore 117543
- 18 J Agric Food Chem. 2008 Jun 25;56(12):4541-4. Epub 2008 Jun 4. Vitamin D2 formation from post-harvest UV-B treatment of mushrooms (*Agaricus bisporus*) and retention during storage. Roberts JS, Teichert A, McHugh TH.
- 19 Davis BC, Kris-Etherton PM. 2003. Achieving optimal essential fatty acid status in vegetarians: current knowledge and practical implications. *Am J Clin Nutr* 78(suppl):640S-46S.
- 20 Rosell MS, Lloyd-Wright Z, Appleby PN, et al. 2005. Longchain n-3 polyunsaturated fatty acids in plasma in British meat-eating, vegetarian, and vegan men. *Am J Clin Nutr* 82:327-34.
- 21 Williams CM, Burdge G. 2006. Long-chain n-3 PUFA: plant v. marine sources. *Proc Nutr Soc* 65:42-50.
- 22 Dr. Andrew Weil, MD. February 2007, "Balancing Omega-3 and Omega-6" www.drweil.com
- 23 Manitoba Harvest Hemp Oils & Foods, <http://www.manitobaharvest.com/>
- 24 Composition of Foods. USDA Nutrient Data Base for Standard Reference, Release 18, 2005, and manufacturers' information.