



# The Plant-Powered Athlete

Danish Society for  
Clinical Nutrition

Matt Ruscigno, MPH, RD  
Thursday 28 February 2019

# Vegetarian Nutrition

a dietetic practice group of the



Academy of Nutrition  
and Dietetics

# Join VN DPG!

As the leading authority on evidence-based vegetarian nutrition, VN DPG's vision is to optimize global health and well-being by:

- Creating and disseminating vegetarian nutrition education materials
- Supporting cutting edge research
- Advocating for influential public policy



# Consumer Website: VegetarianNutrition.net

The screenshot shows the homepage of the Vegetarian Nutrition website. At the top, there is a navigation bar with a search bar, a star icon, and a menu icon. Below this, there are tabs for "Member Website" and "Consumer Website", and links for "Member Login", "Member Benefits", "Join our Group", and social media icons for Facebook, Twitter, and LinkedIn. A dark green navigation bar contains links to "Home", "What is a Vegetarian Diet?", "Vegetarian Teens", "Raising Vegetarian Children", "Vegetarian Diets for Longevity", "Resources", and "Find an RD". The main header features a large image of green tomatoes with the text "Vegetarian Nutrition" in a script font, a search bar, and the "Vegetarian Nutrition" logo, which is a dietetic practice group of the Academy of Nutrition and Dietetics. Below the header, there is a grid of six images. The first image shows a winter garden with the caption "Featured Story Winter Garden". The second image shows a close-up of a sandwich with the caption "Featured Resource Vegetarian & Vegan Myths". The third image shows a bowl of kale with the caption "Featured Recipe Spicy Kale". Below the grid, there is a welcome message: "Welcome to the website of the Vegetarian Nutrition Dietetic Practice Group of the Academy of Nutrition and Dietetics." followed by a paragraph about the mission. To the right, there is a section for "Recent Articles" with a small image of a dish of tomatoes and vegetables.

Consumer Website

Member Login | Member Benefits | Join our Group

Home | What is a Vegetarian Diet? | Vegetarian Teens | Raising Vegetarian Children | Vegetarian Diets for Longevity | Resources | Find an RD

# Vegetarian Nutrition

Search

**Vegetarian Nutrition**  
a dietetic practice group of the  
**eat right.** Academy of Nutrition and Dietetics

Featured Story  
**Winter Garden**

Featured Resource  
**Vegetarian & Vegan Myths**

Featured Recipe  
**Spicy Kale**

## Welcome to the website of the Vegetarian Nutrition Dietetic Practice Group of the Academy of Nutrition and Dietetics.

Our mission as the leading authority on vegetarian diets is to provide tools from evidence-based research to plan all types of vegetarian meals. We want to share information for all age groups, and fitness levels that will promote health and well-being based on the latest research.

### Recent Articles

## Beef or Oats? Which?

One pound of QUAKER OATS  
will make as much bone and muscle  
as three pounds of beef.

One pound of good beef costs  
three times as much as one pound  
of QUAKER OATS.

Given  
Highest  
Award



at the  
World's  
Fair  
1893

TRADE MARK

It should be a crime to give  
children meat three times a day.

It certainly is foolish for grown  
people to eat meat at every meal.

The *best* Oats (Quaker) costs less  
than the poorest beef.

# Defining Diet Styles

- Flexitarian or semi-vegetarian: emphasis on plant foods
- Vegetarian: avoids animal flesh
- Vegan: avoids eggs, dairy and animal flesh in diet and also lifestyle
- Plant-based: Usually defined as a vegan or near-vegan diet that emphasizes whole foods
- Many, many iterations!

# Research

- Vegetarians have been under intense research for decades
- Adventist Health Study 2<sup>1</sup>- Cohort of ~100,000; about 50% vegetarian, 10% vegan
- Oxford EPIC Study<sup>2</sup>- Emphasis on vegetarians

1. Le L, Sabaté J. Beyond Meatless, the Health Effects of Vegan Diets: Findings from the Adventist Cohorts. *Nutrients*. 2014;6(6):2131-2147.

2. Appleby P, Key T. The long-term health of vegetarians and vegans. *Proceedings of the Nutrition Society*. 2015;75(03):287-293.

# Positive health outcomes

- Lower BMI- leaner body mass
- Lower rates of heart disease, stroke, type-2 diabetes, some cancers
- Possible mechanisms
  - More soluble and insoluble fiber
  - More phytochemicals, anti-oxidants
  - Less saturated fat
  - Whole grains, beans, fruits, vegetables, nuts, seeds



# Plant-based recommendations

- Network for a Healthy California, USDA
  - American Heart Association
- “Choose foods like vegetables, fruits, whole-grain products and fat-free or low-fat dairy products most often.”
- American Diabetes Association
- “Fill the largest section of your plate with non-starchy vegetables.”

# Academy of Nutrition and Dietetics Position Paper

“Appropriately planned vegetarian diets, including vegan diets, are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases...

[and] are appropriate for individuals during all stages of the lifecycle, including pregnancy, lactation, infancy, childhood, adolescence and for athletes.”

1. Position of the Academy of Nutrition and Dietetics: Vegetarian Diets. Journal of the Academy of Nutrition and Dietetics. 2016;116(12):1970-80.

# Scott Jurek wins the 2006 Badwater Ultramarathon

- 135 mile running race through Death Valley in July
- Wins 2 straight years, sets the course record
- Credited vegan diet



# Change in perception of vegan diets

- From ideological vegans doing sport to an advantageous diet
- Rich Roll, Scott Jurek
- From body builders to mixed martial artists
- Even BBQ?

# Jehina Malik- vegan since birth





# Sports Nutrition

- Nutrition and Athletic Performance<sup>1</sup>
  - Joint Position Paper with Academy and American College of Sports Nutrition
- Vegetarian and Omnivorous Nutrition: Comparing Physical Performance<sup>2</sup>
  - No distinguished differences found.....more research needed

1. Nutrition and Athletic Performance. Medicine & Science in Sports & Exercise. 2016;48(3):543-568.
2. Craddock J, Probst Y, Peoples G. Vegetarian and Omnivorous Nutrition—Comparing Physical Performance. IJSNEM. 2016;26(3):212-220.

# Sports nutrition

- Total calories

Mechanism: fuel for cells, muscles

Requirements: varies by life stage, activity level

Deficiency: muscle degeneration, lethargy

Sources: carbohydrate, fat, protein

# Carbohydrate

- Academy / SCAN recommendations
  - 45 to 65% of calories
- American College of Sports Medicine
  - 6 to 10 grams/kg body weight
- Paleo for Athletes
  - 45 to 55% of calories (!)

# Protein

Regulation/growth of cells, organs, muscles

\*Requirements: 0.8-2.0 grams per kg body weight or ~10 to 25% of total calories

Deficiency: muscle mass loss, fatigue

“Meet daily needs for protein and essential amino acids by eating a variety of plant-based protein sources.”

-SCAN DPG

# Protein continued

- Plant foods contain all of the essential amino acids
- Need to combine proteins is a myth
- Term 'incomplete protein' is misleading
- Legumes, nuts, seeds, whole grains and more
- Spinach is 30% protein, 1 cup cooked = 5 grams
- Protein Primer on [nomeatathlete.com](http://nomeatathlete.com)



# Amino acid content- legumes

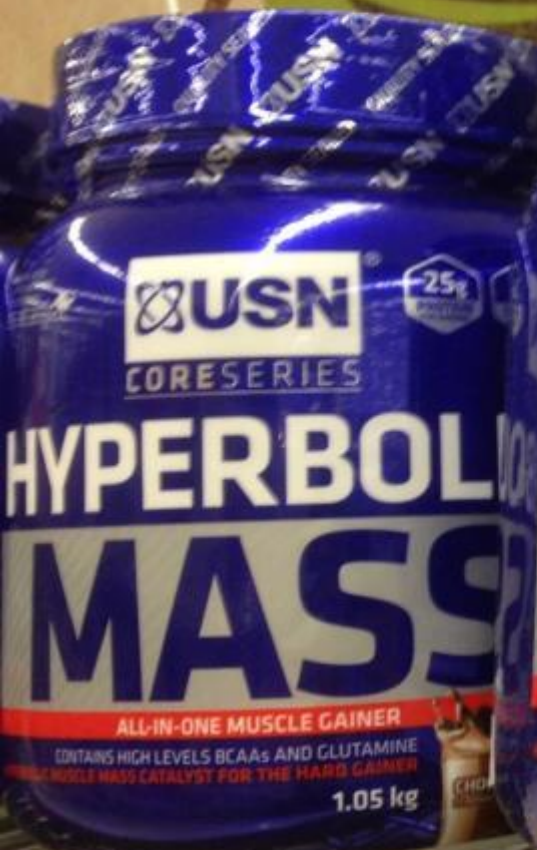
| Legumes  |     |     |     |     |     |            |            |     |     |     |
|--|-----|-----|-----|-----|-----|------------|------------|-----|-----|-----|
| Food   | PRO | HIS | ISO | LEU | LYS | MET<br>CYS | PHE<br>TYR | THR | TRP | VAL |
| <b>Black Beans - cooked</b><br>Serving: 0.50 cup (86 g)            | 7.6 | 212 | 336 | 609 | 523 | 197        | 627        | 321 | 90  | 399 |
| Number of servings to meet RDA                                     | 8.4 | 5.3 | 4.5 | 5.5 | 5.8 | 7.7        | 4.2        | 5.0 | 4.4 | 4.8 |
| <b>Garbanzos (Chick Peas) - cooked</b><br>Serving: 0.50 cup (82 g) | 7.3 | 200 | 312 | 517 | 486 | 193        | 569        | 270 | 70  | 305 |
| Number of servings to meet RDA                                     | 8.8 | 5.6 | 4.8 | 6.5 | 6.2 | 7.8        | 4.6        | 5.9 | 5.7 | 6.3 |
| <b>Kidney Beans - cooked</b><br>Serving: 0.50 cup (89 g)           | 7.7 | 214 | 339 | 613 | 527 | 198        | 631        | 323 | 91  | 402 |
| Number of servings to meet RDA                                     | 8.3 | 5.2 | 4.5 | 5.5 | 5.7 | 7.6        | 4.2        | 4.9 | 4.4 | 4.7 |
| <b>Lentils - cooked</b><br>Serving: 0.50 cup (99 g)                | 8.9 | 251 | 386 | 647 | 624 | 193        | 680        | 320 | 80  | 444 |
| Number of servings to meet RDA                                     | 7.1 | 4.4 | 3.9 | 5.2 | 4.8 | 7.8        | 3.9        | 5.0 | 5.0 | 4.3 |

Compiled by Jack Norris, RD for [veganhealth.org](http://veganhealth.org)

# Amino acid content- vegetables

| Vegetables   |       |      |      |      |      |            |            |      |      |      |
|--|-------|------|------|------|------|------------|------------|------|------|------|
| Food   | PRO   | HIS  | ISO  | LEU  | LYS  | MET<br>CYS | PHE<br>TYR | THR  | TRP  | VAL  |
| <b>Baked Potato</b><br>Serving: 1.00 med (173 g)               | 4.3   | 93   | 175  | 260  | 263  | 121        | 351        | 157  | 67   | 244  |
| Number of servings to meet RDA                                 | 14.8  | 12.0 | 8.6  | 12.8 | 11.5 | 12.5       | 7.5        | 10.1 | 5.9  | 7.8  |
| <b>Broccoli - cooked, chopped</b><br>Serving: 1.00 cup (156 g) | 3.6   | 82   | 180  | 216  | 234  | 88         | 244        | 152  | 48   | 212  |
| Number of servings to meet RDA                                 | 17.7  | 13.6 | 8.4  | 15.5 | 12.9 | 17.2       | 10.8       | 10.5 | 8.3  | 9.0  |
| <b>Carrot - 5 12 inches long</b><br>Serving: 1.00 small (50 g) | 0.5   | 20   | 38   | 51   | 51   | 52         | 51         | 96   | 6    | 35   |
| Number of servings to meet RDA                                 | 135.4 | 55.7 | 39.8 | 65.5 | 59.3 | 29.1       | 51.5       | 16.6 | 66.3 | 54.5 |
| <b>Kale - cooked, shredded</b><br>Serving: 1.00 cup (130 g)    | 2.5   | 52   | 148  | 173  | 148  | 56         | 215        | 111  | 30   | 135  |
| Number of servings to meet RDA                                 | 25.5  | 21.4 | 10.2 | 19.3 | 20.4 | 27.0       | 12.2       | 14.3 | 13.3 | 14.1 |

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# Protein in plant foods

| FOOD                    | AMOUNT   | PROTEIN<br>(gm) | PROTEIN<br>(gm/100 cal) |
|-------------------------|----------|-----------------|-------------------------|
| Tempeh                  | 1 cup    | 31              | 9.6                     |
| Soybeans, cooked        | 1 cup    | 29              | 9.6                     |
| Seitan                  | 3 ounces | 21              | 17.5                    |
| Lentils, cooked         | 1 cup    | 18              | 7.8                     |
| Black beans, cooked     | 1 cup    | 15              | 6.7                     |
| Kidney beans, cooked    | 1 cup    | 15              | 6.8                     |
| Chickpeas, cooked       | 1 cup    | 15              | 5.4                     |
| Pinto beans, cooked     | 1 cup    | 15              | 6.3                     |
| Lima beans, cooked      | 1 cup    | 15              | 6.8                     |
| Black-eyed peas, cooked | 1 cup    | 13              | 6.7                     |
| Veggie burger           | 1 patty  | 13              | 18.6                    |





# Iron

- Iron needs of athletes and plant-based eaters are increased
- Non-heme iron is less well absorbed...
- Vit-C increases absorption ~ 5-fold!
- Vegans may have higher iron intake than vegetarians
- Variety of sources increases absorption

# Plant sources of iron

**Table 1: Iron Content of Selected Vegan Foods**

| <b>Food</b>             | <b>Amount</b> | <b>Iron (mg)</b> |
|-------------------------|---------------|------------------|
| Soybeans,cooked         | 1 cup         | 8.8              |
| Blackstrap molasses     | 2 Tbsp        | 7.2              |
| Lentils, cooked         | 1 cup         | 6.6              |
| Spinach, cooked         | 1 cup         | 6.4              |
| Tofu                    | 4 ounces      | 6.4              |
| Bagel, enriched         | 1 medium      | 6.4              |
| Chickpeas, cooked       | 1 cup         | 4.7              |
| Tempeh                  | 1 cup         | 4.5              |
| Lima beans, cooked      | 1 cup         | 4.5              |
| Black-eyed peas, cooked | 1 cup         | 4.3              |
| Swiss chard, cooked     | 1 cup         | 4.0              |

# Sample meal

- Whole wheat pasta with broccoli, olive oil and tomato sauce

67% carbohydrate, 20% fat, 13% protein

< 800 calories, 32g protein, 22g fiber

167% vit-A, 418% vit-C, 19% calcium, 45% iron

- Add 0.5 cup lentils, remove 1 T oil

78% carbohydrate, 5% fat, 17% protein

41g protein, 30g fiber, Iron 63%, <900 calories





# Non-nutrients in plant foods

- Phytochemicals and antioxidants
  - Reduced inflammatory markers
  - Same function in cardiovascular disease prevention
- Nitric oxide- beets, cacao, plant foods
  - Increase vasodilation and oxygen flow to muscles
  - Increased time to exhaustion

# The future of nutrition is plants

- 25,000 (!) different phytochemicals with potential disease fighting properties

Carotenoids- carrots

Lycopene- tomatoes

Isoflavones- soybeans

Flavonoids- cacao

Anthocyanins- berries

Betalains- beets



# Benefits of plants

- Great carbohydrate to protein ratio
- Fruits and vegetables are hydrating
- Anti-oxidants that may aid recovery
- Healthy fats for increased caloric needs
- Easy to eat

Many athletes are eating  
plant foods most of the time!

# Nutrition for plant-based eating

- Nutrients are derived from more diverse foods than the Standard American Diet (SAD)
- General rule: eating smaller amounts of nutrients more often
- Fruits and vegetables are nutrient-dense: many nutrients for fewer calories. BIG portions!
- Phytochemicals: non-nutritive benefits

# Creating plant-based meals

- Grains, veggies (leafy!), legumes, nuts or seeds
- Emphasis on whole foods
- Vegan meat and cheese can complement
- Variety, variety, variety
- Fruits and salads can be meals
- Discretionary calories...

# Making the switch

- Don't overly restrict:  
    organic, non-GMO, local, raw, juice
- Fat: plant fat is calorically-dense and healthy
- Focus on meal timing
- BIG portions of fruits and vegetables

It's more about what you eat  
than what you don't eat.



## Strongest Hearts 11; Vegan Track Cyclists

from **Strongest Hearts** PLUS 1 year ago / CC BY NC ND ALL AUDIENCES

Meet 3 vegan track cyclists: Kevin Selker, Jack Lindquist and Zak Kovalcik. See full post here, including Kevin's amazing lasagna recipe: [truelovehealth.com/2013/09/17/day-in-the-life-11-vegan-track-cyclists/](http://truelovehealth.com/2013/09/17/day-in-the-life-11-vegan-track-cyclists/)

Matt Ruscigno, MPH, RD  
[www.truelovehealth.com](http://www.truelovehealth.com)





## Vegetarian Nutrition

a dietetic practice group of the  
**eat right.** American Dietetic Association

**RD Resources for Professionals:**

# Sports Nutrition for Vegetarians

**Good nutrition is vital for optimal exercise training and performance.**

To train and perform optimally, athletes of all levels—from recreational to elite—should consume a diet comprised of wholesome foods high in carbohydrate (>50% of energy), low to moderate in fat (20-35%) and adequate in protein, vitamins, minerals, and fluid. A vegetarian diet easily meets these needs and offers additional health and performance advantages. The key is to consume a variety of vegetarian foods including whole-grains, fruits, vegetables, legumes,

for the upper end (8-10 g/kg). Foods high in complex carbohydrates also contain fiber, protein, vitamins, and minerals and offer the best nutrients for enhanced performance.

### Dietary Fat

In the past, athletes have adopted very low-fat diets with the belief that they can lose fat mass. Such diets, however, can impair performance and have negative health consequences such



# Nutrition resources

Vegetarian Sports Nutrition (update 2019!)

-Enette Larson-Meyer, PhD, RD

Vegan For Life -Ginny Messina, MPH, RD; Jack Norris, RD

Plant-powered Diet -Sharon Palmer, RD

Vegetarian Nutrition (.net)

Vegan Health (.org)



Thank you!

Matt Ruscigno, MPH, RD

[mattruscigno@gmail.com](mailto:mattruscigno@gmail.com)

[nutrinic.com](http://nutrinic.com)

@Mattruscigno



# Protein References

Protein requirements for endurance athletes. Tarnopolsky, M. Nutrition. 2004 Jul-Aug;20(7-8):662-8

Plant proteins in relation to human protein and amino acid nutrition. Young VR. Am J Clin Nutr. 1994 May;59(5 Suppl):1203S-1212S

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Protein for exercise and recovery. Krieger RB. Phys Sportsmed. 2009 Jun;37(2):13-21