



Sylvia R. Karasu M.D.
The Gravity of Weight

Vegetarianism: "Shunning the Sacrilegious Taste of Blood"

A "nourishing life" on a diet of fruits, vegetables, grains, and seeds.

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"Spring Morning," by French artist James Tissot, ca. 1875. Author Michael Pollan, in "Food Rules: An Eater's Manual," (2009) writes, "Eat food. Not too much. Mostly plants."

Source: Metropolitan Museum of Art, NYC. Gift of Mrs. Charles Wrightsman, 2009. Public Domain



"Pythagoras Advocating Vegetarianism" by Peter Paul Rubens, ca 1618-1630. Royal Collection, UK. Greek philosopher and mathematician Pythagoras staunchly believed it was a "monstrous crime" to kill animals for food, as described in Ovid's Book XV of "Metamorphoses." Rubens' painting was inspired by Ovid's poem.

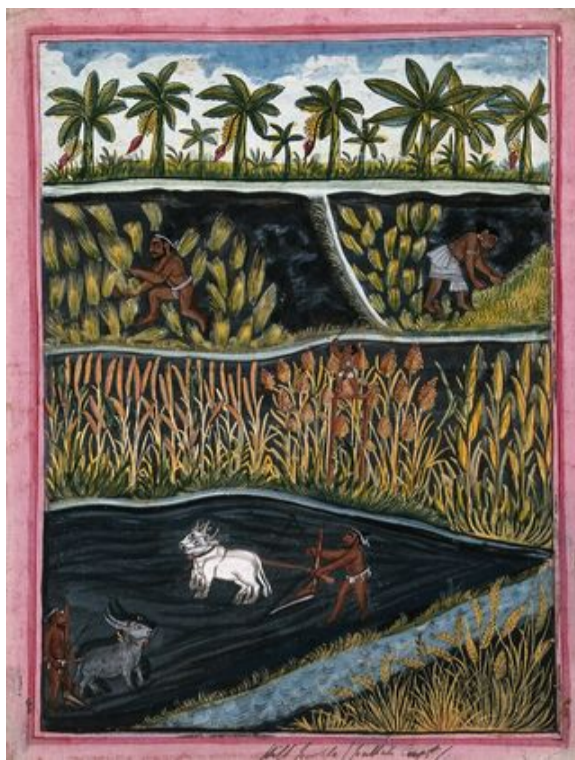
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Pythagoras, the sixth century B.C. mathematician and philosopher of theorem fame, was "a man of science" whose followers "gathered in silence and amazement" as he taught them about the beginnings of the universe. So wrote the Roman poet Ovid in Book XV of his *Metamorphoses*. Most remarkably, though, "He was the first to speak against the use of animals as human food." (Ovid) Says Pythagoras, as quoted by Ovid, "O mortals, don't contaminate your bodies with food procured so sacrilegiously...the earth provides so much abundance... there is no need to slaughter beasts, to shed their blood...It's a monstrous crime indeed...letting another die that you may live." Ovid's tale of Pythagoras apparently inspired the painting by Peter Paul Rubens, "Pythagoras Advocating Vegetarianism." (1618-20) Centuries before the word "vegetarian" was coined in the 1840s, those who abstained from meat were called "Pythagoreans." (*Oxford English Dictionary*), Other reputed vegetarians were Percy Bysshe Shelley, Leo Tolstoy, Leonardo da Vinci, Franz Kafka, and perhaps most famously, Mahatma Gandhi.

For Gandhi, as for Pythagoras, eating meat involved "the infliction of unnecessary pain on and cruelty toward harmless animals," (p. 50) explains Nico Slate in his new book, *Gandhi's Search for the Perfect Diet*, 2019. His vegetarianism grew out of a kind of "radical empathy" for all creatures, says Slate (p. 177). "The pillars of his diet--vegetarianism, limiting salt and sweets, rejecting processed food, eating raw food, fasting--were all deeply connected to his politics, and in particular, to his conception of nonviolence." (Slate, p. 5) For example, Gandhi's decision to limit salt grew out of his protests against British regulations and taxes on salt and his decision to limit sugar, and particularly chocolate, grew out of his concern for the inhuman treatment of indentured laborers. (For more on Gandhi's 1930s 240-mile *Salt Satyagraha* protest, see my previous blog, *Salt Intake: Taking Advice with that Proverbial Grain*: <http://bit.ly/2w93pDi>)

Gandhi had a "remarkably complex relationship with food" (Slate, p. 171) that constantly evolved over time. For much of his life, Gandhi

restricted his food intake, often in response to injustice: Sometimes he limited his food to one meal a day (Slate, p. 150) or five foods a day, or even had prolonged fasts "for penance and purification." (Slate, p. 154) His body mass index (BMI) was calculated to be a severely underweight 16.1 kg/m.² (Slate, p. 7) Gandhi believed, though, that all food should be seen as medicine and, in fact, the Sanskrit word for food and medicine is the same. (Slate, p. 93) His practice of vegetarianism was obviously extreme and not typical of his fellow Indians, one-third of whom are vegetarians.



Indian agriculture and crops. Gouache drawing. In India, approximately one-third of people are vegetarian.

Source: Wellcome Trust Collection, Public Domain



"Costumed Woman with Vegetables," mid-19th century, artist not known, but probably English. From the Robert Lehman Collection, 1975, Metropolitan Museum of Art, NYC.

Source: Metropolitan Museum of Art, NYC. Public Domain.

al, 2019) Beef protein production requires 18 times more land, 11 times more water, 12 times more fertilizers, and 10 times more pesticides than the production of beans, and produces 6 times more animal waste than production required for egg protein. (Segovia-Siapco and Sabaté, 2018)



Two farmers using oxen to plough the land. Watercolor painting by an Indian artist, 19th century.

Source: Wellcome Trust Collection, Public Domain

Vegetarianism can be "traced back to the beginnings of human history." (Segovia-Siapco and Sabaté, *European Journal of Clinical Nutrition*, 2018) There is even the famous short-term "clinical trial" as described in the Bible's *Book of Daniel* in which Daniel demonstrates to King Nebuchadnezzar the health benefits of a vegetarian diet. Except for the Indian population, vegetarianism represents a "small minority worldwide." In the U.S., estimates vary: Approximately 3.3% (Segovia-Siapco and Sabaté, 2018) to between 2% (strictly vegan) to 5% (Appleby and Key, *Proceedings of the Nutrition Society*, 2016) of the population practicing some form of it, with women doing so somewhat more commonly than men.

There are several different patterns subsumed under the plant-based diet of *vegetarian*. These diets "are defined by the foods they exclude" and hence can vary significantly (Appleby and Key, 2016).

Vegans have the strictest diet and do not eat fish, eggs, dairy, or meat; *lacto-ovo vegetarians* will eat the animal products of eggs and dairy, including milk; so-called *semi-vegetarians (pescatarians)* eat fish but no animal flesh, and *flexitarians* will occasionally eat small amounts of meat. (Segovia-Siapco and Sabaté, 2018)

People choose a plant-based diet for three major reasons: concern about their own health, concern about animal welfare, and concern for the environment. In one British study, though, concern for an individual's health was the primary reason; awareness of the impact of food production on climate was low, and there was a "certain culture invisibility" about the treatment of animals slaughtered for food. (Clonan et al, *Public Health Nutrition*, 2015)

Food production and consumption, though, do have an impact on our climate. *The New York Times* (5/1/19, *Food Section*) featured a major article on our food supply and its effects. A plant-based diet is apparently considerably better for the environment: lower greenhouse gas emissions, less topsoil erosion on farmland, less depletion of water resources and less pollution. Beef and lamb, followed by dairy, eggs, pork, and seafood, have "by far the greatest carbon footprint per unit of protein produced." (Gardner et al, *Nutrition Reviews*, 2019) Americans, for the years 2015-2017, consumed about 200 pounds of meat per person and more meat from livestock per person a year than any other country. (Gardner et

The health advantages of a plant-based diet are significant. For example, vegetarianism promotes changes in our microbiome. While humans are 99.9% identical to each other in terms of their genome, their gut microbiome can be up to 80 to 90% different, often related to diet. By lowering the pH of the gastrointestinal tract, a plant-based diet prevents the growth of certain pathogens and may improve systemic inflammation. (Tomova et al, *Frontiers in Nutrition*, 2019) Further, increased dietary fiber bulks up the stool and helps with satiety, and soluble fiber, by binding to bile acids in the small intestine, increases fecal bile salt excretion and ultimately leads to decreased

cholesterol. (Kahleova et al, *Nutrients*, 2014) Discrepancies in results, though, may occur because of different "microbiome profiling methodologies," genetics, BMI, and even consumption of red wine or aspartame. (Tomova et al, 2019)

Further, plant-based diets have been credited with improving insulin resistance (i.e. increased insulin sensitivity), lowering the risk of diabetes, and lowering cardio-metabolic disease (Glick-Bauer and Yeh, *Nutrients*, 2014) as well as improving blood lipid levels, blood pressure, and decreasing the risk of obesity. (Kahleova et al, 2017) They have also been associated with decreasing chronic low-grade inflammation as measured by C-reactive protein (CRP), especially when a vegetarian diet is adhered to for more than two years. (Haghighatdoost et al, *Public Health Nutrition*, 2017.) Many data about eating patterns (as assessed by self-administered food-frequency questionnaires) and morbidity and mortality risks have come from two major ongoing prospective studies, each with a high proportion of vegetarians, *European Prospective Investigation into Cancer and Nutrition* (EPIC-Oxford Study), with over 65,000 participants, (52% meat-eaters) and the *Seventh-day Adventists Study* in North America, with over 96,000 participants (48% meat-eaters.) (Segovia-Siapco and Sabaté, 2018)

Those following a strictly vegan diet may need B₁₂ and calcium supplementation. (Clarys et al, *Nutrients*, 2014) There is an intriguing theory that vegetarian Leonardo da Vinci suffered his stroke (leading to a hemiparesis in the last five years of his life) due to low B₁₂ levels. (Oztürk, *Journal of Medical Biography*, 2009; Oztürk et al, *Frontiers of Neurology and Neuroscience*, 2010) The role of diet for healthy bones is "complex:" there may be a higher risk of fractures and lower bone density in those on a vegan regimen. (Appleby and Key, 2016)



"The Four Seasons Merchant," by French artist Louis Marie de Schryver, 1895.
Source: Alamy Stock Photo. Contributor, Peter Horree, used with permission.

(Clonan et al, 2015)



American artist Thomas Anshutz, "The Way They Live," 1879. Metropolitan Museum of Art, NYC., Morris K. Jesup Fund, 1940.
Source: Metropolitan Museum of Art, NYC, Public Domain.

Studying the benefits of a vegetarian diet, though, is complicated by many of the difficulties typically seen with nutrition studies, including use of different methodologies for measurement and even inconsistent definitions of what constitutes a vegetarian diet. Most studies, as well, are based on self-report from food-frequency questionnaires. In one long-term Finnish study (follow-up of over 22 years), researchers recorded a baseline food record for only four days. (Virtanen et al, *American Journal of Clinical Nutrition*, 2019) Further, studies don't necessarily take into account other aspects of a healthy lifestyle such as exercise, lack of smoking, lower alcohol intake, etc. that vegetarians may be practicing as well (Glick-Bauer and Yeh 2014), and studies often do not consider methods of food preparation, frequency of meat-based meals, and portion sizes.

Bottom Line: People practice vegetarianism because of concern for their own health, concern for animal welfare, and/or concern for the environment. Both observational and randomized controlled trials suggest that a plant-based diet has many health benefits and may even increase longevity, though it is not clear that a strict vegan diet that eliminates not only meat, but eggs, fish, and dairy, is "uniquely" more protective to obtain these health benefits than other forms of vegetarianism. Those who adhere to a strictly vegan diet, though, must be careful to get enough vitamin B₁₂ and calcium. All plant-based foods contain enough protein. A vegetarian diet, with its increased fiber, increases stool bulk and speeds transit time through the bowel and also positively changes the microbiome of our intestinal tract so there are fewer pathogens. Further, there are benefits for our planet in choosing a vegetarian diet: It is more sustainable and less taxing on the environment in terms of land and water usage and results in fewer greenhouse gases.

Note: For those classical scholars among you, you will know my title comes from the John Dryden translation of Book XV of Ovid's *Metamorphoses*.

About the Author



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