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1

Hestloom Tomato

"Fall in love with plants and they will love you back," Sharon Palmer, MSFS, RDN, Plant-Powered for Life

There are 40,000 edible species of plants on the planet, each with the power to nourish and help heal our bodies; each plant has its own story. There are 25,000 types of tomatoes alone!

otos and modros by Chama Balman MCEC BDM

2

Objectives

- Identify health benefits associated with plant-based diets.
- 2. List plant proteins that can replace animal proteins.
- 3. Synthesize strategies for helping people eat a plant-based diet.
- Review how to incorporate plant-based tube feeding formulas for those who are unable to eat by mouth.



Sharen Police

6

3

5

Plant-Based Eating Is Breaking News Why the Clobal Rise in Vegan and Plant-Based Eating Isn't A Fad (600% increase in U.S. Vegans + Other Astourding Stats) 88,879 Interest in Sustainability, Plant-Based Diets Health Survey Note of the Company of the Company

Plant-Based Eating is Hot, Hot, Hot!



- 24% consumers eat more plant protein than previous year (IFIC, 2019).
- Estimated \$140B market for alternative meat in 10 years (Marketwatch, 2019).
- Impossible Burger going nationwide at fast food restaurant, such as BK.
- Veganism on the rise: 11% of Gen Z, 10% of millennials (Hartman, 2017).
- Two-thirds of U.S. consumers say they are eating less meat (Johns Hopkins Center for a Livable Future, 2018).

Photos and recipes by Sharon Palmer, MSFS, RI

Eat food. Not too much. Mostly plants.

Michael Pollan In Defense of Food



Plant-Based Diet: Hits Best Diet List

Plant-based diets are good for the environment, your heart, your weight and your overall health. U.S. News defines plant-based as an approach that emphasizes minimally processed foods from plants, with modest amounts of fish, lean meat and low-fat dairy, " and red meat only sparingly.

US News Best Diets in 2019 Expert Panel

7

Even 2015-2020 Dietary Guidelines More Plant-Based



- Focused on plant-based diet patterns:
 - Mediterranean
 - US Healthy Diet Pattern
 - Vegetarian
- Limit saturated fat
- Eat more fruits and vegetables
- Include more pulses

Plant-Based Diet Part of Blue Zones

- · People live the longest
- · Eat a plant-based diet
- · Sense of community
- Exercise

10





Plants are Part of Indigenous, Traditional Diets

- · Common Features:
 - Local whole grain
 - Local legumes
 - Seasonal cultivated and foraged fruits and vegetables
 - Seeds and nuts
 - Minimally processed
 - Low use of animal foods







We Have Moved to Western Diet



- High in animal foods, highly processed foods, fast foods
- High in sugars, sodium, saturated fat
- · Low in fruits, vegetables, whole grains, legumes
- · Low in fiber, vitamins, minerals, phytochemicals

Sharon Palmer 12

11 12

Plant-Based Eating Has it All

One eating style with so much power:

- Environmental benefits
- · Health benefits
- · Animal welfare benefits
- · Solution for feeding a growing population



Rise of Meatless Monday

Showing Support:



Associated with Johns Hopkins' Bloomberg School of Public Health

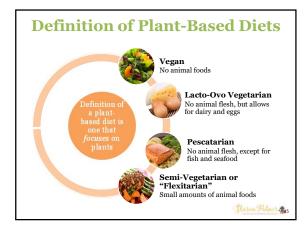
- Organizations, hospitals, schools, universities, restaurants, and more
- · Stars lining up, from Tom Hanks to Rita Wilson
- Key influencers, including Michael Pollan
- Chefs, like Bryce Shuman of Betony, and Anthony Lamas of Seviche



13

15

14



Environmental Benefits of Plant-Based Eating

Plant-Based Eating Patterns: Better Eco-Impact

Lower carbon footprint: compared to non-vegetarians, lower by 20% semi-vegetarian; 24% pescetarian, 28% lactoovo, 42% vegan (AHS-2)



"Nothing will benefit human health and increase chances for survival of life on Earth as much as the evolution to a vegetarian diet.' Albert Einstein

Plant-Based Eating Patterns: Better Eco-Impact



- Reducing livestock production by 50% in EU will reduce greenhouse gas emissions (GHGE) by 25-40% (Global Environmental Change)
- Plant-based diet reduced GHGE 72%, land use 58%, energy consumption 52%, water consumption 33% in Spain, compared to Western diet (Environmental Health Journal)
- Reducing animal products saves water resources; up to amount needed to feed 1.8 billion additional people globally (*IOP Science*)

Thuron Palmer \$17

16

protein=18X less land, 10X less water, 9X less fuel, 12X less fertilizer, 10X less pesticides than beef (Public Health Nutrition)

Person consuming average diet releases 701 kg of CO2 per year more than emissions of person

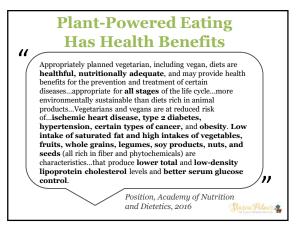
consuming only plants (Earth Interactions) Legumes most efficient protein source: 1 kg



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18





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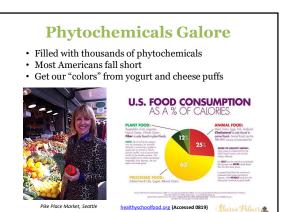


- · High in the "good" stuff:
 - fiber, vitamins, minerals, healthy fats, phytochemicals, low glycemic carbs
- · Low in the "bad" stuff:
 - saturated fat, dietary cholesterol, sodium, toxins (nitroso compounds, heterocyclic amines, polycyclic aromatic hydrocarbons, glycation end products formed in cooking, curing, processing meats)

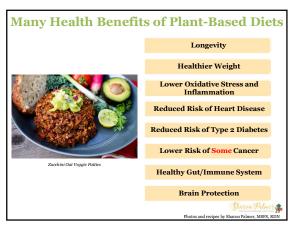


Green Bean, Chickpea, and Farro Salad with Za'atar

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21



Longevity

- EPIC-Elderly Study (European Prospective Investigation into Cancer and Nutrition), more closely adhered to plant-based diet, longer lifespan (Public Health Nutr).
- Vegetarians: 12% lower risk of dying over the study period compared to meat eaters; vegans 15% lower (JAMA Intern Med).
- Diets with higher amount of protein from plants linked with lower mortality (Am J Kidney Dis).
- High animal protein linked with increasedmortality; sub plant protein lower mortality (JAMA Intern Med).



23 24

Healthier Weight

Patients assigned to vegan or vegetarian diet lost significantly more weight over 2 months than those omnivorous diet — about 5% of body weight compared with a 2% loss.



- EPIC study, BMI fish eaters, vegetarians, and particularly vegans lower than meat eaters (Int J Obes Relat Metab Disord) Example: 55 year old male or female vegan weighs 30 pounds less than non-vegetarian of similar height.
- Vegan diet most effective in weight loss among 5 diet patterns, vegetarian, pescatarian, semivegetarian, and omnivorous (Nutrition).
- Meta-analysis: Med diet may be useful for weight reduction (Metab Syndr Relat Disord).
- Review: Flexitarian diet weight and metabolic benefits (Front



Reduced Risk of Heart Disease

25

Lower Oxidative Stress & Inflammation

- Studies show high intake of whole plant foods, such as fruits, vegetables, whole grains, nuts, tea, coffee, red wine and olive oil, decreases levels of oxidative stress and inflammation, which are associated with the development of chronic disease (Am J Clin Nutr, 2006, J Am Coll Cardiol).
- In Adventist Health Study II, vegetarian diet linked to lower CRP levels, a marker of inflammation (Ethn Dis).
- Framingham Heart Study, higher intakes of anthocyanins and flavonols linked with reduction in oxidative stress biomarkers (Am J Clin Nutr).



The risk of hospitalization or death from heart disease is 32% lower in vegetarians than in people who eat meat and fish, according to a British study (Am J Clin Nutr).

26

28

Meta-analysis, 25% reduced risk of ischemic heart disease with vegetarian and vegan diet (Crit Rev Food Sci Nutr). Several studies show heart

benefits, possibly due to lower inflammation, oxidative stress, blood pressure, LDL levels (Am J Clin Nutr).

Veg diet linked with more favorable CVD biomarkers, vascular function (Int J Cardiol).

27

Lower Risk of Type 2 Diabetes

- Red meat linked with higher risk type 2 diabetes, but when one serving swapped for nuts every day, decreased risk by 21%, substituting whole grains reduced risk by 23% (Am J Clin Nutr).
- (Am J Clin Nutr).

 Meat-eaters significantly higher risk of developing diabetes, compared with people who avoided meat (Nutrients).

 Vegetarian diet patterns linked with lower Metabolic Syndrome, and lower risk of developing type 2 diabetes (Br J Nutr).
- Review from Canadian Diabetes
 Association: Plant-based diets
 beneficial in management of
 type 2 diabetes (Can J Diabetes).





29 30

Lower Risk of Cancer

- Meta-analysis, 8% reduced risk of total cancer with vegetarian and vegan diet (Crit Rev Food Sci Nutr). Plant foods linked with
- protection against mouth, pharynx, esophagus, stomach, lung, pancreas, and prostate cancer; in particular, high fiber plant foods may protect in digestive cancers (AICR).
- Study linked **plant-based diet to 20% lower breast cancer risk**(Am J Epidemiol).
- Vegetarians 22% lower risk colorectal cancer (JAMA Intern Med).



World Cancer Research Fund Cancer Prevention Recommendations

- Be as lean as possible without becoming
- Be physically active for at least 30 minutes every day.
- Limit consumption of energy-dense foods.
- Eat more of a variety of vegetables, fruits, whole grains, & pulses, such



- · Limit consumption of red meats (such as beef, pork and lamb) and avoid processed meats.
- Limit alcoholic drinks
- Limit consumption of salt & avoid moldy grains and cereals. Don't use supplements to
- protect against cancer.
- It is best for mothers to breastfeed exclusively for up to 6 months and then add other liquids and foods.

Photos and recipes by Sharon Palmer, MSFS, RDN 3:

31

33

32

Healthy Gut & Immune Function



Increasing evidence fiber-rich, plant-based diet promotes healthy gut microbiota, linked to immune support and digestive

Vegan gut profile: **reduced pathobionts** (**disease**causing organisms), increased protective species (Nutrients).

EPIC study, lower rate of hospital admissions, risk of death from diverticular disease in vegetarians (BMJ). Mediterranean diet beneficial

for gut microbiota (Gut).

Chronic inflammation and oxidative stress lead to development of Alzheimer's disease (AD).

Brain Function

- Adherence to Mediterranean, plant-based diet linked with lower risk of AD (Arch Neurol).
- 7 Dietary and Lifestyle guidelines to reduce risk of
 - · Minimize saturated and trans fat
 - · Eat plant-based foods
 - Consume 15 mg vitamin E from foods each day (Neurobiol Aging)



34

Adventist Health Study-2

Vegan Tamale Pie

96,000 adults 5 diet patterns

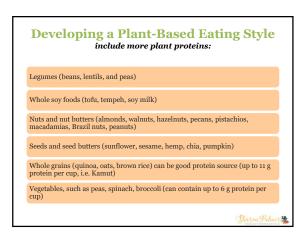
(non-vegetarian, semi-vegetarian, pescetarian, lacto-ovo vegetarian, vegan)

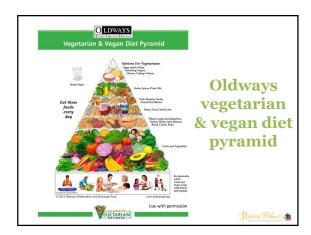
Showed overall linear relationship: BMI, HTN, type 2 diabetes, elevated total cholesterol, CRP, insulin, overall cancer, mortality, carbon footprint

AHS-2: Relative mean food intake of vegetarian groups compared to non-vegetarians Food consumption differs substantially across dietary patterns • Vegetarians consume greater plant foods and reduced amounts of sweets, added fats, non-water beverages, and animal foods as commared to nonfruit vegetables avocados potatoes grains legumes oy foods & meat analogues compared to nonnuts & seeds ■ Vegan vs. Nonveg meat Lacto vs. Nonveg dairy products Pesco vs. Nonveg eggs added fats Semi vs. Nonveg sweets Sabate J, Wien M. Am J Clin Nutr. 2010;91(5):1525S-1529S. snack foods Sabaté J, Wien M.. Br J Nutr. 2015;113(2):S136-43. doi: 10.1017/S0007114514004139 beverages drinking water

0.00 0.50 1.00 1.50 2.00 2.50 3.00

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Laws Enacted for Plant-Based Meals Requirement

- CA signs law (SB 1138) making state first to require prisons, hospitals, nursing homes, and other state-operated facilities to offer plant-based meals (no animal products).
- NY state law (S1471) passed requiring hospital patients plant-based options.
- It's Happening! Bellevue NYC Plant-Based Lifestyle Medicine Program (plant-based doctor, RD, coach)



Support for Plant-Based Hospital Food



- In 2017, AMA adopted resolution calling hospitals to align their menus with their health care mission and to "improve the health of patients, staff, and visitors by providing a variety of healthful food, including plant-based meals and meals that are low in fat, sodium, and added sugars, eliminating processed meats from menus, and providing and promoting healthful beverages.

 57% of hospitals serve less meat than
- 57% of hospitals serve less meat than previous years
- 82% of hospitals purchase locally produced foods
- produced toods
 20% of hospitals have farmers markets,
 gardens, produce prescription, and/or
 community supported agriculture (CSA)
 programs (Health Care Without Harm)
 Cool Food Pledge (HCWH): reduce GHGE
 by 25% by 2030, increase plants and
 reduce animal foods.

39 40

Plant-Based Trends in Tube Feedings

- We've come full circle from the old days of blenderized tube feeding formulas to synthetic formulas and back to foods in tube feedings. Offer plant-based options for patients, even for those who are tube-fed.
- Families want to provide real, plant-based foods for tube-fed members, especially for children long-term.
- Want to feel "normal", "healthy", and "real".
 Follows right along with
- mainstream eating trends, for "clean", organic, plant-based eating.
- Desire real foods in tube feedings, such as fruits, vegetables, nuts, grains, pulses.



Plant-Based Tube Feeding Options

New plant-based formulas available, such as:



- Functional Formularies® Liquid Hope®: Organic garbanzo beans, green peas, carrots, brow rice, flax oil, quinoa, sweet potato, broccoli, almond butter, kale, garlic, turmeric, rosemary, ginger, seaweed, vitamin blend.
- Kate Farms®: Pea protein formula with phytonutrients, includes brown rice syrup, sunflower oil, inulin, flax seed oil, quinoa flour, chia, with added vitamin and minerals.
- Nestlé Health Science Compleat® Organic Plant-Based Blends: Blueberries, kale, pears, sweet potatoes, brown rice flour, pea protein, cinnamon and ginger, with added vitamins and minerals to meet age-appropriate DRI (distinct formulas for adults and children).
- Real Food Blends®: Quinoa, kale & hemp: Grape juice, kale, hemp, olive oil, quinoa, cinnamon.

41 42

Positive Vibes for Real Food, Plant-Based Feedings

- Well received by health care professionals (RD, MD, RN), caregivers, families.
- Use in healthcare setting, as well as, home care setting.
- Provides synergistic benefits of whole
- Survey shows HCP like for: ingredient list, better tolerance, failure with other formulas, improved diarrhea/stools, improved pro/cal status (Kate Farms, 2018).
- "Tastes" better (when burped); less retching/gagging (J Par Ent Nutr).

43

Increased interest in home blenderized foods using high quality blender; shared meals, increased variety, lower cost, improved tolerance. Importance of food safety, contaminants, difficulty in administration through tube, nutritional planning, PBEN may be better option.



Concerns: Nutritional Status for Children on Plant-Based TF



- Long term pediatric use of plant-based tube feedings prompts nutrition concerns for growth and development.
- Well-planned plant-based diets (vegan, vegetarian) appropriate for all ages and life cycles, including infants and toddlers (AND, AAP).
- Over 30 years know that well-planned vegan diets are nutritionally adequate for growth and development during early years (JADA).
- Long history of plant-based diets among children.
 - Support family's concerns and desires with accurate information.

Plant-Based Benefits For Children

- Research shows kids on plant-based diets have lower risks of obesity, heart disease, type 2 diabetes, hypertension, cancer and other conditions (Eur J Nutr)
- Compared with nonvegetarians, vegetarian children leaner, and BMI difference becomes greater during adolescence (Am J Clin Nutr).
- (Am J Clin Nutr).
 Diets low in energy density, high
 in complex carbs, fiber, water,
 which may increase satiety and
 resting energy expenditure
 (Am J Clin Nutr).
- Vegetarian children consume more nutrients, i.e., vitamins A, C, and folate, fiber and iron than non-vegetarians (JADA).



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Plant-Based Nutrient Needs for Children · Iron: Children on vegan diets do not

Vegan children meet or exceed recommendations for most nutrients and have higher intakes of fiber, lower intakes of fat, saturated fat, cholesterol. Yet, nutrients of concern:

44

Protein: Plant foods can provide all essential amino acids; no need to complement proteins at same feeding.



- experience anemia; but increased iron needs due to bioavailability (vitamin C can enhance).
- Zinc: Deficiency rare in vegans; found in soy, legumes, nuts.
- Calcium: May be of concern among vegan children; supplementation, consumption of plant sources (soy, low-oxalate greens) key.
- Fat: Lower fat intake impact on growth is negligible. Important to get ALA for conversion to EPA, DHA or microalgae supplements.
- Vitamin B12: Intake essential (5 50 mcg/day, depending on age).
- Vitamin D: Should be supplemented, in addition to sun exposure 20-30 min three times/week (depending on skin, location).
- Iodine: Via iodized salt or supplements. (Paediatr Child Health)

45 46

Research on Plant-Based Enteral Feedings (PBEN):

- PBEN improves health of microbiota in chronically ill children (JPEN).
- Plant derivatives in enteral nutrition may help reduce side effects and improve immune response, per preliminary research (Univ Wisconsin).
- Need more research to fully understand benefits and risks.



Sharon Palmer

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47 48



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49