

Adherence to a mixture of raw food-based diets and their effects on disease and illness.

Andrea D. Comer & Eli A. Cox

Western Oregon University

### **Abstract**

*Objective:* To further analyze the effects consumption of a plant based diet will have on conditions of chronic disease and other illnesses. *Methods:* We used tertiary data extracted from previous literature analysis pertaining to our topic of interest. *Results:* While there are proven benefits to eating a diet focused on raw foods in a short time span, more evidence is needed to show that a raw food diet alone can consistently have positive effects on disease and illness for long term adherents.

**Key Words:** Raw diet, uncooked health benefits, disease prevention, vegan, B12, obesity, food-borne illness, energy deficiency.

## Introduction

The association between dietary intake and overall physical health has proven to have a parallel relationship in conjunction with one another. The human diet plays a very important role in the etiology and prevention of cancer and other serious cardiovascular and neurodegenerative diseases.<sup>1</sup> Though consumption of raw foods has been advocated since the early 1900s in popular books, worldwide, little research data are available on the subject of raw foods diets.<sup>2</sup> Western diet patterns are high in fried foods, salty snacks, eggs, and meat.<sup>3</sup> These patterns make it difficult to achieve a high carotenoid diet intake and they are strong predictors of cardiovascular events.<sup>3,4</sup> Overall fat intake in adherents to a raw food diet was remarkably lower than in the average Western diet.<sup>5</sup> Various books and websites assert that raw vegan food has healing properties.<sup>6</sup>

## Methods

For our topic we searched a variety of databases including Psych Info, Medline, Gale, Ebsco, and Google Scholar. We started by using key words such as "Diet" "Raw" and "Uncooked Food" and kept finding the same articles repeated. We then expanded our search terms to include key words such as "benefits", "energy", "illness", and other descriptive words pertaining to our topic of interest. We also located potential articles by looking at the citations of prominent articles we found and checking out their original sources. Our associations of interest included the influence of diet in various conditions of disease and illness. For the purpose of this research, focus areas included but were not limited to overall well-being, plasma levels, body mass index and vitamin B<sub>12</sub> deficiency.

## Results

### *Definitions*

The basic ideas of a “living-food” or “raw food” diets are consuming all or primarily uncooked foods. These diets are a subset of vegan diets consisting of fruit, berries, vegetables, mushrooms, nuts, seeds, legumes, and cereals.<sup>2,4,7</sup> Many variants of the raw food diet exist and there is no one definition.<sup>5</sup> Some articles required that 40%-85% of an individual’s total dietary intake contain uncooked foods in order to be considered raw. High plant protein diets did include a small intake of meat products.<sup>2,3,8</sup>

Raw food adherent’s typically eat single item foods within a meal rather than a mixture of sorts.<sup>4,5</sup> The physicochemical and nutritional qualities of a number of foods can be widely modified by cooking processes.<sup>1</sup> However, uncooked foods can form a health risk if contaminated by viable pathogenic organisms<sup>9</sup> Some adherents believe that a beneficial component of plant matter is destroyed when food is heated beyond a certain temperature.<sup>2,9</sup>

### *Facts*

A large body of evidence indicates that predominately plant-based diets can effectively contribute to the prevention of cardiovascular disease.<sup>5</sup> Plant-based diets are considered a good source of carotenoids and a high intake of such is considered an important factor in prevention of degenerative diseases. However plant based diets contain factors such as dietary fiber that interfere with carotenoid absorption and can deprive the organism of valuable vitamins or other compounds such as iron.<sup>4,9</sup> Fruit and vegetable consumption among raw food diet adherents is much higher than the average consumption of the general population in the USA.<sup>4</sup> On average,

adherents did not meet recommendations for calcium-rich foods, protein-rich foods, and grains and have been related to low bone mass.<sup>2,5</sup>

#### *Plasma levels*

Results of several studies suggest that strict vegetarian diets have a high prevalence of elevated plasma total homocysteine, which is considered an independent risk factor for cardiovascular disease.<sup>5</sup> Added fats were the main predictor of plasma carotenoid concentrations. Results suggest that the low intake of visible fats was a limiting factor for absorption of carotenoids.<sup>4</sup> Serum triglyceride level also decreased significantly and 90% of participants showed desirable total cholesterol concentrations after consuming raw food-based diets.<sup>5,9</sup>

#### *Energy levels & BMI*

Upon acceptance and new practice of a raw food diet some experience mild weakness.<sup>8</sup> Although high in dietary fiber, this dietary regimen is low in energy.<sup>5,8</sup> Advocates of the diet report that the adoption phase of the diet causes several adverse symptoms like malaise, nausea, headache and increased mucus production.<sup>9</sup> Subjects' claims of health benefits and promotion of wellbeing are consistent with findings of other studies of adherents to a raw foods diet.<sup>2</sup> A stay at a raw vegan institute was associated with improved mental and emotional quality of life, noted an elevation in mood, and a feeling of well-being although it is unknown if diet alone is the primary reason for these findings.<sup>6,9</sup>

The diet appears to provide enough calories to support weights at or near ideal body weight or within the normal weight range of 18.5–24.9 for BMI for most subjects, though the majority reported weight losses at the outset of the diet, specifically a significant decrease in

BMI.<sup>2,7,9</sup> Considerations for this may include that uncooked food may contain more vitamins, thereby being more satiating, may reduce caloric intake and reduce weight.<sup>8</sup>

### *Vitamin B<sub>12</sub> Deficiency*

Consumption of a generally raw food diet lack sufficient vitamin B<sub>12</sub> sources.<sup>4,5,7,8,10</sup> While consuming the “living food” diet a supplement was advised and exclusively raw food diets are not recommended without a vitamin B<sub>12</sub> source included. It is noted that all strict vegans eventually suffer from vitamin B<sub>12</sub> deficiency.<sup>7,8,10</sup> Vitamin B<sub>12</sub> deficiency can lead to pernicious anemia, gastrointestinal disorders, and neurological damage.<sup>10</sup>

## **Discussion**

### *Study design & Limitations*

The study design in the articles selected for review included descriptive non-experimental, observational, case control, and cross sectional with time lengths from one week to thirteen years. A cross-over design would have increased the value of the study and further verify the results.<sup>2,3,5-7</sup>

A cross sectional study design can possess limitations as well as the heterogeneity with regard to the types of raw food diets.<sup>4</sup> This sort of experiment is impossible to carry out blindly due to its nature alone.<sup>7</sup> Non-randomization may have included a bias and therefore made it difficult to control for other confounders.<sup>2,6</sup> A small, nonrandom sample was used and, therefore, the results cannot be generalized to the larger population of individuals consuming a raw foods diet.<sup>2</sup> Raw food diets are extreme dietary regimens that have not been investigated extensively.<sup>5</sup> For those that have been investigated the benefits are still considered controversial.<sup>4</sup> There is also

little information about the effect of consuming a raw vegan diet on the immune system.<sup>6</sup> Extra caution is suggested when studying vulnerable populations and assessment of the nutritional adequacy of the diet is most reliably made on a case-by-case basis.<sup>2,6</sup>

## References

1. Domingo J. Influence of cooking processes on the concentrations of toxic metals and various organic environmental pollutants in food: a review of the published literature. *Crit Rev Food Sci Nutr.* 2011;51(1):29-37.
2. Hobbs S. Attitudes, practices, and beliefs of individuals consuming a raw food diet. *Explore.* 2005;1:272-277.
3. Fujita A, Hashimoto Y, Nakahara K, Tanaka T, Okuda T, Koda M. Effects of a low calorie vegan diet on disease activity and general conditions in patients with rheumatoid arthritis. *Rinsho Byori.* 1999;47(6):554-560.
4. Garcia A, Koebnick C, Hoffmann I, et al. Long-term strict raw food diet is associated with favourable plasma beta-carotene and low plasma lycopene concentrations in Germans. *Br J Nutr.* 2008;99(6):1293-1300.
5. Koebnick C, Garcia A, Hoffmann I, et al. Long-term consumption of a raw food diet is associated with favorable serum LDL cholesterol and triglycerides but also with elevated plasma homocysteine and low serum HDL cholesterol in humans. *J Nutr.* 2005;135(10):2372-2378.
6. Link L, Hussaini N, Jacobsen J. Change in quality of life and immune markers after a stay at a raw vegan institute: A pilot study. *Complement Ther Med.* 2008;16:124-130.
7. Kaartinen K, Lammi K, Hypen M, Nenonen M, Hanninen O, Rauma A.-L. Vegan diet alleviates fibromyalgia symptoms. *Scand J Rheumatol.* 2000;29:308-313.
8. Douglass J, Rasgon I, Fleiss P, Schmidt R, Peters S, Abelmann E. Effects of a raw food diet on hypertension and obesity. *South Med J.* 1985;78(7):841-844.

9. Hanninen O, Nenonen M, Ling W, Li D, Sihvonen L. Effects of eating an uncooked vegetable diet for 1 week. *Appetite*. 1992;19:243-254.
10. Donaldson M. Metabolic vitamin B12 status on a mostly raw vegan diet with follow-up using tablets, nutritional yeast, or probiotic supplements. *Annu Nutr Metab*. 2000;44:229-234.
11. Rauma A, Nenonen M, Helve T, Hanninen O. Effect of strict vegan diet on energy and nutrient intakes by Finnish rheumatoid patients. *Eur J Clin Nutr*. 1993;47(10):747-749.
12. Wrangham R, Brittain NL. Cooking as a biological trait. *Comp Biochem Physiol*. Part A. 2003;136:35-46.
13. Briscoe D. Raw foods, macrobiotic style!. *Macrobiotics Today*. July 2007;47(4):5-9.
14. Cook B. How she cooked health problems: Lisa Montgomery credits raw foods, and the Royersford woman has become an authority. *The Philadelphia Inquirer*. February 10, 2008.
15. Crowe K. Chocolate: Raw, organic and healthy. *The Frederick News-Post*. April 4, 2012.
16. Delcour J, Bruneel C, Lamberts L, et al. Fate of starch in food processing: from raw materials to final food products. *Annu Rev Food Sci Technol*. 2010;1:87-111.
17. Fontana L, Meyer T, Klein S, Holloszy J. Long-term low-calorie low-protein vegan diet and endurance exercise are associated with low cardiometabolic risk. *Rejuvenation Res*. 2007;10(2):225-234.
18. Garcia A, Mohan R, Hoffmann I, et al. Plasma beta-carotene is not a suitable biomarker of fruit and vegetable intake in german subjects with a long-term high consumption of fruits and vegetables. *Ann Nutr Metab*. 2010;56(1):23-30.

19. Hankison J. Differing opinions of raw food diet research. *J Am Vet Med Assoc.* 2001;218(0):1554.
20. Hanninen O, Rauma A, Kaartinen K, Nenonen M. Vegan diet in physiological health promotion. *Acta Physiol Hung.* 1999;86(3:4): 171-180.
21. Huynh D. Get fresh and eat in the raw: Devotees say uncooked food paves the way to better health. *Houston Chronicle.* January 5, 2009.
22. Jerry S. Healthful, raw-food trend is picking up steam. *USA Today.* n.d.
23. Link L, Jacobson J. Factors affecting adherence. to a raw vegan diet. *Complement Ther Clin Pract.* 2008;14(1):53-59.
24. Nash J. Eat it raw. *Essence.* 1992;23(1): 127.
25. Nash J. Live foods. *Essence.* 1995;26(2):91.
26. Nenonen M, Helve T, Rauma A, Hanninen O. Uncooked, lactobacilli-rich vegan food and rheumatoid arthritis. *Br J Rheumatol.* 1998;37(3):274-281.
27. Orenstein P. Totally uncooked. *New York Times Magazine.* September 2002;151(52228):52.
28. Robinson J. Nutrition educator advocates uncooked-food for good health. *The Charleston Gazette.* February 4, 2009.
29. Sharon K. All steamed up about raw food. *The Times.* n.d.
30. Song M, Rosenthal M, Song A, Yang H, Ao Y, Yamaguchi D. Raw vegetable food containing high cyclo (his-pro) improved insulin sensitivity and body weight control. *Metab Clin Exp.* 2005;54(11):1480-1489.
31. Tania A. Raw power. *The Sunday Times.* n.d.

32. Torronen A, Hanninen O, Mykkanen H. Vitamin B-12 status of long-term adherents of a strict uncooked vegan diet ("Living Food Diet") is compromised. *J Nutr.* 1995;125: 2511-2515.
33. Unknown. Is Raw Really Better? EN weighs in on the raw vs cooked debate. *Environ Nutr.* 2005;28(7):7.
34. Yakub M, Iqbal M, Iqbal R. Dietary patterns are associated with Hyperhomocysteinemia in an urban Pakistani population. *J Nutr.* 2010;109(12047):1261-1266.