Nutrition and Health Info Sheet:
The Paleo Diet

For Health Professionals

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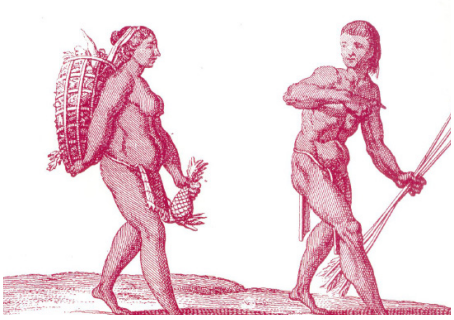
2018

What is the Paleo Diet?



The Paleo diet, also referred to as the Paleolithic diet, emphasizes an increased consumption of lean meat, fish, shellfish, fruit, vegetables, eggs, nuts, and seeds while excluding grains, legumes, cereals, dairy, processed foods, refined sugars and added salt.[1] The Paleo diet has gained popularity all over the world, and in 2014, it was the most searched diet-related term via Google.[2]

This diet pattern finds its roots in our human Paleolithic ancestors who consumed foods available from their environments through hunting, fishing, and gathering. Since humans followed hunter-gatherer lifestyles for many thousands of years, the advocates of the Paleo diet claim the human body became especially well adapted to this diet.[3] However, the composition of the ancient Paleolithic diet varied greatly based on geographic region.[2]

Critics of the contemporary Western diet postulate that the rise in chronic illnesses such as diabetes mellitus, hypertension, and cardiovascular disease, is due to the influx of processed, refined, and sodium-heavy foods made widely available to the public, and that the nutritional quality of an ancestor-based diet may have therapeutic value in the treatment of chronic disease.[3,4]

Are there benefits to consuming a Paleo diet?

At first glance, it appears as if the Paleo diet would be healthy as it encourages an increased consumption of fruits and vegetables, which may reduce blood pressure, low-density lipoprotein (LDL) levels, and reduce risk for congestive heart disease and stroke.[5] The increase in consumption of fruits and vegetables also increases the dietary consumption of some essential vitamins like Vitamins A, C, and E.[1] However, there is a paucity of scientific research supporting many of the claims associated with the diet.

The Paleo diet discourages the consumption of sodium; short-term reductions in sodium may reduce blood pressure in some individuals. In addition, the Paleo diet eliminates the consumption of refined carbohydrates, which in excess, can be associated with an increased risk for type 2 diabetes and congestive heart disease.[5]

Under short-term circumstances (i.e. 12 weeks), a Paleo diet has been shown to improve fat mass, insulin sensitivity, glycemic control and leptin in patients with type 2 diabetes.[6,7] Limited research shows that the Paleolithic-like diets may also decrease markers of inflammation and oxidative stress

in adults,[8] and are inversely associated with all-cause and cause-specific mortality in adults.[9]

A review of four randomized, controlled trials examining the effects of the Paleo diet on factors related to metabolic syndrome reported that waist circumference, triglycerides and blood pressure were significantly decreased with consumption of the Paleo diet; HDL-cholesterol and fasting blood sugar were not affected. Positive effects were more drastic in the single trial that provided the meals to participants rather than ones that only gave dietary recommendation. The quality of this evidence was rated as moderate based on the grading Recommendation Assessment, Development and Evaluation Approach used by Manheimer and team, with some concerns noted about high risk bias in one study.[2]

What are the negative aspects to consuming the Paleo diet?

The Paleo diet strongly discourages the consumption of many foods that provide health benefits, such as legumes, whole grains, and dairy. Observational studies have shown that legume consumption improves multiple cardiovascular risk factors, protects against type 2 diabetes, reduces systolic blood pressure and arterial pressure, reduces hemoglobin A1c levels in diabetic patients, and reduces LDL concentrations in the blood. Low-fat dairy has also been associated with positive health benefits such as lower blood LDL concentrations, triglycerides, plasma insulin, BMI, blood pressure, waist circumference, and reduced diabetes risk. Fermented dairy products have been found to be inversely associated with type 2 diabetes.[5]

Limitation of grains and dairy in the Paleo diet may limit the intake of key nutrients like fiber, vitamin D, calcium, thiamin, riboflavin and iron.[1] The limitation of salt and dairy in the Paleo diet also increases one's risk for developing iodine deficiency.[1,10]

Short term studies on the effects of the Paleo diet have shown that calcium intake is well below the recommended daily intake levels for healthy adults.[1] This is especially concerning as the increase in dietary protein increases loss of calcium in the urine, further reducing calcium levels. This may increase the risk for bone demineralization, osteoporosis, and osteopenia in the modern day if not sufficiently balanced with increased fruit and vegetable intake that are sources of calcium. The Paleo diet also provides no dietary vitamin D, further affecting the absorption of calcium.[3] There is also a debatable risk of high-protein intake on kidney function.[11]

Scientific literature does not support the claims made by proponents of the Paleo diet because, at this time, there is a paucity of empirical research. When compared to other diets, like the Atkins diet, there is less proof to suggest either short-term or long-term weight loss benefits from the Paleo diet.[12] Data in support of long-term adoption of the Paleo Diet are not strong at this time as it tends to be a difficult diet for study participants to adhere to for long-term follow-up.[13]

How does the Paleo diet compare to the current Dietary Guidelines for Americans 2015-2020?

Adherence to a Paleo diet results in a macronutrient makeup that varies from the recommendations set forth in the Dietary Guidelines for Americans 2015-2020. Table 1 shows some notable differences in nutrients in reported hunter-gatherer diets, a contemporary Paleo diet, and Dietary Guidelines recommendations.

> Protein: While evidence shows that the average late Paleolithic era diet has protein composition that falls within the current guidelines, the contemporary diet contains slightly more protein than the Dietary Guidelines recommend. The diets of hunter-gatherers were

likely to be made up of 50 to 80 percent plant sources and 20 to 50 percent animal sources of protein, which would suggest that some groups of hunter-gatherers also fell outside the guidelines.[14]

Carbohydrates: The contemporary Paleo diet falls quite short of the recommended carbohydrate intake compared to the Dietary Guidelines despite evidence that ancient hunter-gatherers had higher intakes of carbohydrates than what is suggested by the modern diet.

Fats: The contemporary Paleo diet exceeds the recommended fat intake despite lower fat content in ancient diets. This may be due to the animal protein; ancient game meat was vastly different than the domesticated animal protein consumed today in both total fat content and macronutrient content of the meat.[14]

Table 1: Comparison of Paleo Diet Nutrient Composition and the Dietary Guidelines

	Late Paleolithic Era Diet[14,15] *	Contemporary Paleo Diet[3] †	Dietary Guidelines for Americans[16] ‡
Protein (% energy)	34%	38%	10-35%
Carbohydrate (% energy)	45%	23%	45-65%
Fiber (g)	45.7	38.6	28
Total Fat (% energy)	21%	39%	20-35%
Saturated Fat (% energy)	6%	7%	<10%
Sodium (mg)	687	660	2300
Potassium (mg)	7000	8238	4700
Vitamin A (mcg)	††	5805	700
Folate (mcg)	††	810	400
Vitamin B12 (mcg)	††	16	2.4
Vitamin C (mg)	392.3	680	75
Vitamin D (IU)	††	‡‡	600
Vitamin E (IU)	††	17.7	15
Calcium (mg)	1580	628	1000
Iron (mg)	††	22.1	18
Zinc (mg)	††	24.9	8

**based on 3000kcal daily intake †based on 25-year-old female, 2000kcal daily intake calculated ‡based on 19-30 year old female, 2000kcal daily intake ††all values for the Late Paleolithic Diet are not known ‡‡estimates of vitamin D intake on the modern Paleo diet are unavailable, however there is concern that the Paleo diet severely limits dietary sources of vitamin D*

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