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The Paleolithic Diet

The Paleolithic Diet is a controversial topic amongst nutritionists. This report explores the origins of this diet, contends that the modern western diet is discordant with our genetic inheritance and that such evolutionary discordance has enormous ramifications on fitness and survival (physical and mental health) and outlines the advantages and disadvantages of eating like a caveman in the 21st Century.¹

The 'Paleolithic Era' or 'the Stone Age' commenced well before modern people emerged from Africa and spread through Europe, Asia, Australia and the Americas (a migration that is thought to have begun about 130,000 years ago). It ended with the adoption of agriculture and the construction of the first cities about 10,000 years ago. During the Paleolithic Era rapid evolution of the human species was taking place. By about 40,000 years ago, our remote ancestors were virtually genetically identical to modern people and the human genome has changed little since then (0.005%).²

The word diet has its origins from the Greek word "diaita", which means way of life. During the Paleolithic Era, all people were hunter-gatherers and lived on game animals, seafood, vegetables, fruits, nuts, tubers). There were no crops of cereal foods such as rice and wheat, staples in most societies today and no-one ate milk products or drank milk after weaning. Potatoes, salt, yeast, legumes, caffeine, processed food and alcohol were also notably absent.^{1, 3}

Evidence from fossil records⁴, paleontological evidence⁵, ethnographic data from 181 modern hunter-gatherer societies (such as the Bushmen of southern Africa and Australian Aborigines) suggest that Palaeolithic diets varied considerably and there was no single diet.⁶ The range of available foods varied widely not only geographically but also seasonally and was far greater than the variety of food we eat today. In general, the mean plant to animal subsistence ratio in terms of energy was 35% plant and 65% animal.⁶⁻⁹ This suggests that humans evolved on a diet that was primarily animal based and consequently low to moderate in complex carbohydrates (fruits and vegetables- about 25% of total calories), high in protein (up to 35% of total calories) and low to moderate in fat (about 40% of total calories).¹⁻⁹ This is in stark contrast to the low fat, high carbohydrate diet, universally recommended by nutritionist today.⁴

Departure from the paleolithic diet and the adoption of agriculture with the inclusion of cereals, legumes, dairy products and processed foods is out of sync with our genetic blueprint and has created a plethora of modern diseases as our bodies try to cope with these foreign foods.^{10,11} The fossil record shows a massive decrease in average height, health and rapid increase in disease, obesity and population for cultures that survived the transition from a hunter-gatherer lifestyle to an agriculturally dependent one.¹⁰⁻¹⁴ A myriad of auto-immune diseases (coeliac, MS), food allergies, obesity, diabetes, cancer, cardiovascular disease, Attention Deficit Hyperactivity Disorder (ADHD), Autism, Depression and Schizophrenia has been shown to be linked to the adoption of these unnatural human foods.¹⁴⁻³⁶ Interestingly, after the age of five years humans do not produce the lactase enzyme and 87% of the world's population are lactose intolerant. Furthermore, gluten intolerance usually occurs with a lactose intolerance. Children with ADHD are seven times more likely to be intolerant to these universally accepted staples.³⁶

Our ancestors consumed a greater intake of vitamins, minerals and other food constituents that are now considered to be important to health, such as antioxidants, glyconutrients and bioflavonoids in their food, than we do today. Numerous scientific studies now extol the important health benefits of such a diet.³⁷⁻⁴⁹

The large quantities of unprocessed carbohydrates typically eaten by the hunter-gatherers provided much of the energy needed for hunting and gathering high-fibre fruits, primitive forms of leafy vegetables, root vegetables (such as yams and sweet potatoes) and contained abundant micro-nutrients. Since these are digested slowly and have a low glycemic index, early humans avoided the problem of large amounts of glucose being dumped into the bloodstream at once. Exposure to large glucose loads (50-60% calories in the modern diet), creates insulin resistance, leading to such ailments as obesity and Type 2 diabetes. Nutritionists at the Harvard School of Public Health have publicly criticised the food pyramid since this places breads, cereals, rice and pasta at its base and recommends that we consume 6-11 servings of these items daily and because it fails to distinguish between refined and complex carbohydrates and their relative glycemic responses. Dr. Willett further pointed out that there was little empirical evidence to support the dominant nutritional message that diets high in these foods promote good health.⁵⁰

Ironically, whole grain cereals espoused by nutritionists are devoid of Vitamin C and beta carotene (except for yellow maize). They have poorly absorbable vitamin B6, and the phytate levels in grains impairs the absorption of most of the divalent minerals- calcium, magnesium, iron and zinc.^{51, 52} Although they contain intrinsically higher nutrient levels than do refined cereal grains, the biological availability of nutrients in whole grain cereals remains paradoxically low because of their high anti-nutrient content.⁵¹ Wheat based starch has endogenous alpha amylase inhibitors which not only effectively inhibit salivary amylase but also influences pancreatic amylase secretion.⁵³ Legumes, soy and potatoes were notably absent from the Paleolithic diet. Legumes are poisonous if eaten raw and they are high in lectins, protease inhibitors and phytates. The high lectin content of whole grain cereals can bind enterocytes in the small intestine and cause villous atrophy in addition to changing tight junction characteristics thereby allowing intestinal antigens (both dietary and pathogenic)

access to the peripheral circulation. Lectins have been identified as inflammatory and toxic and have a causal relationship with auto-immune diseases such as rheumatoid arthritis, Type 1 diabetes and lupus.⁵⁴⁻⁵⁸

Furthermore, the presence of trypsin inhibitors in legumes and grains interferes with the breakdown of proteins into amino acids and increases pancreatic cholecystokinin levels and leads to pancreatic enlargement. Both alpha-amylase inhibitors (cereals & legumes) and trypsin inhibitors (legumes) are not fully denatured by normal cooking processes.^{56, 59} Commercially available soybean products retain 5-20% of trypsin inhibitors.⁵⁹ Therefore, vegetarians seeking protein from legumes may actually be making their protein deficiency worse. Furthermore, the soy industry has been pushing the benefits of soy with the result that most processed foods contain soy additives, lacing our food with possible toxins which at best will result in gastrointestinal problems and mineral deficiencies and at worst could induce an auto-immune response in biologically susceptible individuals.^{56, 57, 59, 60}

Additionally, cereal grains contain low levels of essential fats and have quite high omega 6 and omega 3 fatty acid ratios. Excessive consumption is associated with a wide variety of health problems. In animal models, rickets are routinely induced by feeding them high levels of cereal grains.⁶¹ Hypogonadal dwarfism is found more often in populations consuming high (~50% of total energy) from unleavened whole grain breads for example in Iran where they consume an unleavened bread called tanok.^{62, 63}

Protein intake (25-35%) was exclusively from game animals (high in iron, B vitamins and minerals but low in fat) and fish (omega-3) rather than the 10-15% consumed today which mainly comes from high fats meats, grains, dairy products and legumes. The alarming increase in Celiac and Chron's disease, Type 1 diabetes, rheumatoid arthritis, MS and other auto-immune diseases is a result of these new peptides from cereals, legumes and milk which through the process of molecular mimicry induces the HLA system response.^{64,65} Furthermore, the potentially psychoactive substances (exorphins) in cereals and milk produce qualitatively the same effect as those produced by other opioid and / or dopaminergic drugs (reward, motivation, reduction of anxiety, a sense of well being and even addiction).^{2, 66-75} This chemical reward was the incentive for the adoption of cereal agriculture in the Neolithic era. Regular self administration of these substances facilitated the behavioural changes that led to the subsequent appearance of civilisation.^{6, 70}

"The fact that overall health declined when they were incorporated into the diet suggests that their rapid, almost total replacement of other foods was due more to chemical reward than to nutritional reasons."⁶ Interestingly, major civilisations (in south-west Asia, Europe, India, Egypt, Ethiopia) stemmed from groups which practised cereal, particularly wheat, agriculture.^{3, 6, 8, 11, 51} Groups which practised "vegeculture", or no agriculture (Australia, north and central Asia, tropical and south Africa) did not become civilised to the same extent. Foods that were common in the diet before agriculture do not have this pharmacological property. It is perhaps relevant to point out that recent hunter-gatherer populations (Amazonian Indians, Bushmen, Australian Aborigines) were not afflicted by modern ailments such as heart disease,

diabetes, cancer, osteoporosis until they started eating a Western diet and adopt our sedentary lifestyle.^{1,3, 6, 11,15, 51}

While the Paleolithic diet comprised 35-40% fat, the fat content of "game animals" and fish is mostly monounsaturated and polyunsaturated fat compared to the quantity of saturated fats and trans fatty acids consumed today.^{3, 6, 8, 9, 10} Their omega 6 : omega 3 ratio would have been less than 4 compared to 10 in most western countries. Evidence linking dietary fat to serum total cholesterol concentrations is incontrovertible: the prime agents are saturated (15% in American diets) and trans fatty acids from hydrogenated vegetable fats and oils.^{3, 6} For ancestral humans the cholesterol-raising saturated fatty acids constituted about 5% of total energy intake and trans fatty acid intake was almost negligible.^{76, 77} The omega 6 : omega 3 imbalance in current Western diets also affects coronary disease. Excessive omega-6 Arachidonic Acid relative to omega-3 DHA and eicosapentaenoic acid (EPA) adversely affects platelets and arterial walls so as to promote development of coronary atherosclerosis.⁴⁰ The more balanced omega-6 : omega-3 dietary PUFA intake of Paleolithic humans would have negated this effect.⁸ Studies of plasma omega-6 : omega-3 ratios in patients with depression reveal a direct association with higher ratios of omega-6 to omega-3 that result in more frequent and severe depressive episodes.¹⁷⁻¹⁹

Infant nutrition in the Paleolithic Era was far more basic than now. Breastfeeding (currently encouraged and recommended as the sole source of nutrition for about six months) was probably continued for several years. The 'naturalness' of breastfeeding, and its many advantages to both mother and baby, are fully recognised by nutritionists today. Lactose intolerance would have been non-existent and betacasomorphin peptides would not have been in the digestive tract.⁷⁸ Furthermore essential fatty acids would have been abundant in mother's milk.⁴⁶ "Deficiency of long chain PUFA at any stage of foetal and or infant development can result in irreversible failure to accomplish specific components of brain growth. There is good evidence today that lack of abundant, balanced DHA and AA in utero and infancy leads to lower intelligence quotient and visual acuity and in the longer term contributes to clinical depression, and attention deficit hyperactivity disorder" (Broadhurst Cunnane and Crawford 1998).⁷⁹ Dyspraxia and learning difficulties are also associated with this deficiency and constitute 20% of the school population worldwide.⁸⁰⁻⁸²

During the Paleolithic era, micronutrient consumption was about three times that of today since the diet was rich in fruits and vegetables. Antioxidants, vitamins, minerals have been shown to lower the risk of cancer and heart disease.^{40, 41, 43-45} Additionally, the average salt intake was probably no more than about one-fifth that of most Australians today. However, rather than being a drawback of the Paleolithic diet, this is regarded as being beneficial, because low salt intake is strongly associated with reduced risk of hypertension.⁸³

As Cordain (1999) points out "low fat, high carbohydrate cereal and legume-based diets are not necessarily healthful and populations who consume low fat, high carbohydrate diets with little or no animal protein, paradoxically suffer high rates of diseases of insulin resistance and high levels of cardiovascular disease."⁶ Epidemiological studies of vegetarian Hindu populations from India have shown mortality rates from cardiovascular disease that are similar or greater than those rates found in European countries, despite their vegetarian diet.⁶

"The implications of a Paleolithic diet are that humans tend to do quite well on high protein animal-based diets in many regards including vitamin, minerals, and fatty acid profiles. The whole concept of animal-based foods as deleterious needs to be rectified. And the idea that if a little bit of whole grain is good for you, then a lot should be better, needs to be reconsidered" (Cordain⁶). Since the human body was designed for movement (analysis of skeletons of Paleolithic people shows that they were generally tall and strongly-built, as a result of their diet and physical activity¹⁴), exercise is an important part of the diet. Foods excluded include sugar, dairy products, grains (including cereals, corn, breads, pasta), potatoes, beans, soy beans and lentils.⁸⁴⁻⁸⁶

The major hurdle in adopting a truly paleolithic diet is that there simply isn't enough organic food to feed the planet. The food industry and fast food chains simply would not forgo massive profits in order to change the current system of food production if most people stopped eating bread, pasta, rice, beans, milk and milk products, and significantly increased their intake of meat and fresh fruit and vegetables. There would also be massive disruption to the environment and global reorganisation would be necessary.

However, the evidence presented suggests that human health and well being can be optimised when we use the evolutionary paradigm as the starting point for present day nutrition. The modern high carbohydrate, high fat, cereal based diet which is omnipresent in western, industrialised countries contributes to a myriad of diseases⁸⁶ and is in need of urgent revision.

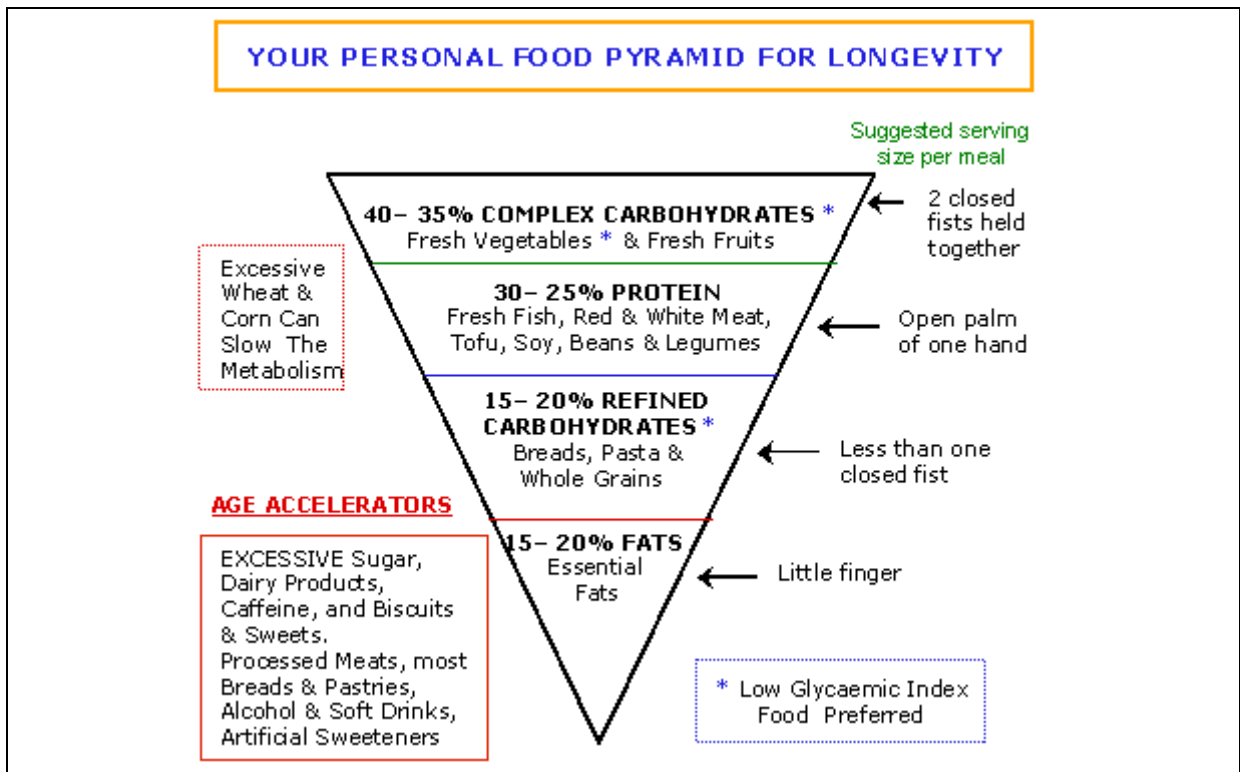


Diagram from: "The Anti-Ageing Diet" by Brain Sher

For more information or to make an appointment please contact us on (02) 9637 9998 during business hours.

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