Back To Our Ancestor's Diet- A Healthy Move

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Abstract: The first building blocks of life may have originated when the radiation from the sun on the primordial oceans and beaches oxidized compounds to produce pantetheine, a form of the B-vitamin pantothenic acid. Pantetheine is the precursor of coenzyme A, a molecule that links amino acids together to form proteins-and makes possible the creation of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) that are the building blocks of the genes that make life possible on this planet.

Modern diets are out of sync with our genetic requirements. The less we eat like our ancestors, the more susceptible we are to coronary heart disease, cancer, diabetes, and many other "diseases of civilization".

100,000 generations of people were hunter-gatherers, 500 generations have depended on agriculture, 10 generations have lived since the start of the industrial age, and only two generations have grown up with highly processed fast foods.

Our diet today is substantially different from our evolutionary diet. In other words, our diet today fails to provide the biochemical and molecular requirements of H. sapiens.

It would appear that the guidelines put forth in the Building Blocks for Healthy Eating would certainly bring us closer to the Paleolithic diet which our genes are dictating is of greatest benefit than those put forth by the 1992 US Department of Agriculture Food Pyramid[28] as it currently stands. Perhaps, as a society, we would be better served to adopt the guidelines of the Building Blocks for Healthy Eating in place of those put forth by the USDA Food Pyramid.

Key Words:
Nutrition, Paleolithic, diet, dietary guidelines, USDA Food Pyramid, Building Blocks for Healthy Eating.

Today's newspaper carried the front-page article that scientists have just completed mapping out the human genome. This is a marvelous finale to the twentieth century and the old millenium. We are on the brink of new discoveries in virtually all fields of human knowledge. It is an exciting time to be alive. It is also a time of retrospect, of looking back to see where we came from and just how the journey went.

Perhaps it is time to look back to the beginning - the very beginning, to see where we came from, where we are headed, and if our current path is the one that we truly desire. [1]

It has been postulated, by Stanley L Miller, Ph.D. of the University of California, San Diego, that the first building blocks of life may have originated when the radiation from the sun on the primordial oceans and beaches oxidized compounds to produce pantetheine, a form of the B-vitamin pantothenic acid.[2]

Pantetheine is the precursor of coenzyme A, a molecule that links amino acids together to form proteins-and makes possible the creation of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) that are the building blocks of the genes that make life possible on this planet. Many other molecules formed over the next several billion years and helped to construct the countless forms of life we see today. Due to their common ancestry, all of these life forms became dependent on essentially the same group of nutrients. [1]

According to S. Boyd Eaton, M.D., one of the foremost authorities on paleolithic (prehistoric) diets, modern diets are out of sync with our genetic requirements. He makes the point that the less you eat like your ancestors, the more susceptible you'll be to coronary heart disease, cancer, diabetes, and many other "diseases of civilization." [3]

Also, according to Eaton, 99 percent of our genetic heritage dates from before our biological ancestors evolved into Homo sapiens about 40,000 years ago, and 99.99 percent of our genes were formed before the development of agriculture about 10,000 years ago.

Before the advent of agriculture, all people were hunter-gatherers: they gathered various fruits and vegetables to eat and they hunted animals for their meat. Of necessity, the ratio of meat and fruits/vegetables varied with geographic location, climate and season. Until these hunter-gatherers began to cultivate grains and livestock, they rarely drank milk beyond infancy or ate grains. [1]

With the spread of agriculture, the nomadic groups became more stable larger societies in order to tend the fields. Culture and knowledge became more commonplace and flourished. People also began to consume large amounts of grains, milk and domesticated meat. They also became more sedentary. [1]

With the advent of the industrial revolution, even more dramatic changes were forthcoming. Beginning around 1900, whole grains were routinely refined, removing much of their nutrition, and refined sugar started to become commonplace. In 1939, nutritionist Jean Bogert noted, "The machine age has had the effect of forcing upon the peoples of the industrial nations (especially the United States) the most gigantic human feeding experiment ever attempted."[4] Over the past 40 years, the average diet has changed even more dramatically than Bogert could have imagined, due primarily to the growth of fast-food restaurants.

According to Eaton, the many dietary changes over the past 10,000 years have outpaced our ability to genetically adapt to them. "That the vast majority of our genes are ancient in origin means that nearly all of our biochemistry and physiology are fine-tuned to conditions of life that existed before 10,000 years ago," he says. [5]

To put this into another perspective, 100,000 generations of people were hunter-gatherers, 500 generations have depended on agriculture, 10 generations have lived since the start of the industrial age, and only two generations have grown up with highly processed fast foods. "The problem is that our genes don't know it," Eaton points out. "They are programming us today in much the same way they have been programming humans for at least 40,000 years. Genetically, our bodies now are virtually the same as they were then." [6]

By working with anthropologists, Eaton has created what many experts consider a clear picture of our prehistoric diet and lifestyle.

Today's plethora of diets - from fast-food burgers to various concepts of balanced diets and food groups - bear little resemblance, superficially or in actual nutritional constituents, to the diet H. sapiens and its ancestors consumed over millions of years. For example, vitamin intake is lower today and the dietary fatty acid profile is substantially different from our evolutionary diet. In other words, our diet today fails to provide the biochemical and molecular requirements of H. sapiens. [1]

We might do well to examine how the dietary constituents, past and present, stack up. We will compare and contrast the recommendations made in the 1992 U.S. Department of Agriculture Food Pyramid (DAFP) and those of the Building Blocks for Healthy Eating (BBHE), a document devised by members of the American Chiropractic Association Council on Nutrition.

To better understand how this document came into being, a brief history of its development might be in order.

At the 1997 annual meeting of the American Chiropractic Association Council on Nutrition (ACA-CON), President Dr. Jerrold Simon brought up a motion on a position that was presented at the ACA meeting that year. The ACA asked if the Council on Nutrition (CON) would endorse the standard 1992 USDA Food Pyramid. We had a rather lengthy, heated discussion on the topic, but the overwhelming feeling was "absolutely not." It was suggested that we respond with statement that we are investigating it ourselves. At that, Dr. Simon created a committee from the membership of the CON to formulate a new "pyramid" with Dr. William J. Rice as the chairman.

Over the next year, Dr. Rice communicated via fax and e-mail with the fifteen or so people who volunteered to be on the committee. We used the pyramid as a guide, but quickly decided what the flaws were in the pyramid design and concept. We researched the recommendations from many sources. This was not a simple task as there are a number of our fellow practitioners who are vehemently opposed to certain foods in the diet, such as dairy products. We tempered all radical ideas with the concept that this program was for everyone and needed to reflect moderation.

Therefore, dairy products are included, but we recommend organic, natural products free of pesticides, herbicides and hormones. In addition, we recognize that a great number of people are either allergic and/or sensitive to dairy products or do not have the necessary enzyme (lactase) to digest dairy products. So we added a caveat about that. We also made it clear that this document was intended as a generalized chart and that people should check with their health care practitioner for specific recommendations.

One of the most important differences between the BBHE and the 1992 DAFP is that the BBHE chart lists the most important foods first on top - where they belong - not at the base of some arbitrary geometric shape. We also considered water to be the most important nutrient as our bodies are almost 70% water. [13]

Another important difference is that our group was not influenced by any outside organization or industry. We were only concerned with what foods are best for the general public. We were not concerned with offending the cattle or dairy industry, etc.

One major criticism of our chart was the lack serving sizes. That was done intentionally to give the practitioner the prerogative of making individual plans for their patients. There were adequate references for drinking 6-8 glasses of water daily, so that remained. Another problem we encountered was where to put certain foods such as beans and legumes that are vegetables, but also quite high in protein. We compromised by including them in both categories.

The BBHE is a model for a balanced diet. It moved away from the very high carbohydrate diets, yet is careful to not be classified as a high protein diet. It is much closer to the Zone diet (40-30-30) with an emphasis away from the fats and processed foods.[26] This dietary approach will help to keep the blood glucose and insulin levels balanced, and is therefore, anti-inflammatory in nature.

There are many foods listed on the BBHE chart that may be strange to many people. The idea is to give people a wide variety of foods to choose from which will help reduce the risk of developing food allergies and provides a variety of nutrients unavailable in monotonous diet. Whole grains such as kamut, millet, kasha, spelt, and amaranth for example, are all readily available in every health food store and many supermarkets across the country.

Our goal is to replace the 1992 Department of Agriculture Food Pyramid with the Building Blocks for Healthy Eating in every nutritional-oriented source in the world. We would like to distribute these charts and posters to the schools and practitioners and make them aware of the means of healthier eating. This chart will be available in 8 ½ x 11-inch pads of 50 and 16 x 20-inch posters through the ACA Council on Nutrition.

In the interest of clarity, a comparison chart is provided below.

A Comparison Chart of the Building Blocks for Healthy Eating and The 1992 U.S Dept. of Agriculture Food Pyramid.

NUTRIENT	BUILDING BLOCKS	FOOD PYRAMID
Water, Purified	**6-8 (8 oz.) glasses daily**	**No recommendations.**
Complex Carbohydrates (from vegetables and beans)	Vegetables, tofu, beans & legumes-fresh or frozen; vegetable juices. **4-6 servings daily.**	**No specific recommendations.** Included in complex carbohydrates from starches.
Complex Carbohydrates (from starches)	Bread, cereals & baked goods. Unprocessed whole grains- Whole wheat, barley, oats, brown rice, rye, corn, millet, kasha, spelt, amaranth, kamut, etc. Potatoes with skins, whole grain breads, whole grain breakfast cereals, whole grain pasta, whole grain crackers. Rice cakes, whole grain pretzels, popcorn. **2-3 servings daily-Balanced with Protein.**	Breads, cereals, rice and pasta. Includes complex carbohydrates from starch sources. **6-11 servings daily.**
Protein	Fish, wild game, poultry, free-range beef and lamb, nuts tofu seeds, eggs, beans & legumes **2-3 servings daily.** Milk - skim or 1%, yogurt, kefir, buttermilk, low-fat cheese. (If approved by your health care practitioner. **1-2 servings daily**	Meat, poultry, fish, dry beans, eggs & nuts. **2-3 servings daily.** Milk yogurt, and cheese **2-3 servings daily.**
Fruits	Fresh, frozen, dried or juice **1-3 servings daily.**	Fresh fruits, fruit juices, and frozen, canned, or dried fruit. **2-4 servings daily.**
Vegetables	Included with complex carbohydrates (from vegetables and beans)	Starchy vegetables, (potatoes, corn, peas) Legumes (navy, pinto, and kidney beans, chickpeas), other vegetables(lettuce, potatoes. onions, green beans.) **3-5 servings daily.**
Fats	Avocados, olives, cold-pressed oils (safflower, olive, flax), butter mayonnaise, salad dressings, nuts seeds (avoid saturated fats, margarine, hydrogenated & partially hydrogenated oils and trans-fatty acids.) **1-2 servings daily.**	It is recommended that Americans limit fat in their diets to 30 percent of the calories. **Use sparingly.**
Simple carbohydrates	Sugars, white flour, sweets, cookies, cakes and processed foods **Not recommended**	**Use sparingly**

When we originally began writing this article, we had in mind to compare the DAFP model of good nutrition to the BBHE. In the process of trying to do this, we found that it was a little like trying to compare apples and oranges-both fruit but very different in their structure and value.

Water: For one thing, the food pyramid model makes no mention at all of water. Since the human body is comprised of 57 to 75 percent water, these authors found this disconcerting. In a newborn infant, the percentage may approach 75 percent, undergoing a steady decline from birth to old age. Also obesity decreases the percentage of water in the body to as low as 45 percent. [13]

Water is the universal solvent used for virtually all biochemical processes in the body. Its importance cannot be overstated.[27] To be adequate to perform these functions, the water must be free of organisms and chemicals that cause disease. The tap water that many of us drink often does not fulfill this requirement. Too often, tap water still bears chemicals (such as trihalomethanes, a by-product of chlorination) or parasites that produce spores that are impervious to chlorination (such as cryptosporidium). [14,15,16]

There are many sources of pure water available. Bottled water is available in the supermarket or can be ordered delivered by a company specializing in bottled water. While bottled water obtained from a reputable source is one of the most common options, there are inconveniences associated with its use. A 5-gallon bottle of water is cumbersome to change when empty and necessitates the purchase or rental of a dispenser.

Another method involves point-of-use filtration. With this system, an activated carbon filter is connected to the water supply just before the sink faucet. The primary advantages to this system is convenience, cost, and an assurance that the water being consumed is not in danger of being contaminated by the plumbing between the municipal water treatment facility and your faucet. There are several companies producing excellent water filtration systems. Look for the NSF certification to determine what contaminates the filter is capable of eliminating.

The recommendations for the amount of pure water that should be consumed varies with the individual making the recommendation, but the consensus of opinion seems to be that the American public does not drink enough water, considering water's importance to the body. Many authorities recommend drinking 1 oz. of purified water per kilogram (about 2 pounds) of body weight. [27] As mentioned earlier, that amount increases with advancing age and/or obesity.

Carbohydrates. Early humans obtained about half of their calories from carbohydrates, but these carbohydrates were rarely grains. Most carbohydrates came from vegetables and fruit.

"Current carbohydrates often takes the form of sugars and sweeteners...Products of this sort, together with items made from highly refined grain flours constitute empty calories...devoid of accompanying essential amino and fatty acids, vitamins, minerals and possibly phytochemicals," says Eaton. [7]

Fruits, vegetables, and fiber. Over the course of a year, gatherer-hunters typically consumed more than 100 different species of fruits and vegetables. These foods provided more than 100 grams of fiber daily, promoting regular bowel movements. Says Eaton: "The fiber in preagricultural diets came almost exclusively from fruits, roots, legumes, nuts and other naturally occurring noncereal plant sources, so it was less associated with phytic acid than is fiber from cereal grains." (Phytic acid interferes with mineral absorption.)

Today, fewer than 9 percent of Americans eat the recommended five daily servings of fruits and vegetables. According to Gladys Block, Ph.D., a nutritional epidemiologist at the University of California, Berkeley. Even people who regularly do eat fruits and vegetables generally limit themselves to a handful of different foods. [8]

Protein and Fat. Early humans consumed about 30 percent protein, although it varied with the season and geographic location. Much of this protein came from what people now call "game meat" - undomesticated animals, such as deer and bison. Based on contemporary studies of hunter-gatherer societies, early humans consumed relatively large amounts of cholesterol (480 mg daily), but their blood cholesterol levels were much lower than those of the average American (about 125 mg per deciliter of blood). There are a couple of reasons for this.

1. Domestication of animals increases their saturated fat levels and alters the ratio of omega-6 to omega-3 fatty acids. Most Americans consume an 11:1 ratio of omega-6 to omega-3 fatty acids. But, based on evolutionary and anthropological data, a more ideal ratio would be in the range of 1:1 to 4:1. In other words, our ancestors consumed a higher percentage of omega-3 fatty acids - and we probably should too.

2. Gathering and hunting required considerable physical effort, which means early humans exercised a lot, which would have burned fat and lowered cholesterol levels. "Their nomadic foraging lifestyle required vigorous physical exertion, and skeletal remains indicate that they were typically more muscular than we are today," says Eaton. "Life during the agricultural period was also strenuous, but industrialization has progressively reduced obligatory physical exertion." [9]

Vitamins and minerals. Both meats derived from wild game and wild plant foods contain higher amounts of vitamins and minerals relative to their protein and carbohydrates. Eaton observed: "The fruits, nuts, legumes, roots and other non-cereals that provided 65-70% of typical gatherer-hunter subsistence were generally consumed within hours of being gathered, with little or no processing and often uncooked...it seems inescapable that pre-agrarian humans would generally have had an intake of most vitamins and minerals that exceeded currently recommended dietary allowances." [10]

Especially dramatic is the difference in consumption of sodium and potassium - electrolyte minerals necessary for normal heart function.

According to Eaton, the typical adult American consumes about 4,000 mg of sodium daily, but less than 10 percent of this amount occurs naturally in food. The rest is added during processing, cooking, or seasoning at the table.

Potassium consumption is lower, about 3,000 mg daily. In contrast, early humans consumed only an estimated 600 mg of sodium, but 7,000 mg of potassium daily. People, says Eaton, are the "only free-living terrestrial mammals whose electrolyte intake exhibits this relationship." [10] That reversed ratio could be one reason why people are so prone to hypertension and other heart ailments.

Dietary vitamin and mineral levels in the past were 1.5 to 5 times higher than they are today. There is evolutionary evidence that large doses of vitamin C may be needed for optimal health. The reason has less to do with diet than it does with an accident of evolution. There was a time in our history, according to biochemist Irwin Stone, Ph.D., some 25 to 70 million years ago, that a catastrophic event of an unknown nature occurred that led to a mutation that prevented the descendants of our species from manufacturing their own Vitamin C. Nearly all other species, from insects to mammals, continue to produce their own Vitamin C. Scientists generally accept his theory regarding how our ancestors lost their ability to produce vitamin C. His other theory is more controversial. He contended that people never lost the need for large amounts of vitamin C, although they lost the ability to manufacture it. Based on animal data, he estimated that people might require 1.8 to 13 grams of vitamin C daily. [12]

According to a new theory, losing the ability to produce vitamin C may have actually accelerated the evolution of primates into modern human beings. Vitamin C is an important antioxidant, and losing the ability to produce it would have allowed the formation of large number of free radicals. These excessive free radicals would have caused large numbers of DNA mutations, contributing to the aging process and diseases. Some of these mutations would also have been inherited by offspring, creating many biological variations - one of which eventually became H. sapiens.

Other significant departures of the BBHE from the 1992 DAFP are the recommended sources for complex carbohydrates. The 1992 DAFP recommends primarily grains and grain products (starches) as the major source for these, while the BBHE recommends that the primary source of complex carbohydrates be found in vegetables, tofu, beans, legumes and vegetable juices. The BBHE also recommends complex carbohydrates from starches, just less (2-3 servings of whole grain products) than from vegetables and beans (4-6 servings daily)

Another major departure from the 1992 DAFP is in the area of protein sources. While the food pyramid recommends 2-3 servings daily of lean beef, pork, veal, lamb, chicken and turkey, the BBHE recommends the same 2-3 servings of proteins from meat sources, but from somewhat different sources (fish, wild game poultry, free-range beef and lamb, nuts, seeds, eggs, tofu, beans and legumes.) It has been well documented that cold-water fish is very beneficial in restoring a much more desirable Omega 3 to Omega 6 ratio. [17,18,19]

The 1992 DAFP recommends 2-3 servings daily of milk, yogurt and cheese, while the BBHE recommends only 1-2 servings daily of skim or 1% milk, yogurt, kefir, buttermilk, or low-fat cheese.

The final point of departure between the two systems in question has to do with fats. While the BBHE calls for 1-2 daily servings of fat (from avocados, olives, cold-pressed oils, butter, mayonnaise, salad dressings, nuts and seeds), the 1992 DAFP simply advises to use sources of fats and oils sparingly. There is, however, increasing

evidence that some of the mono-saturated oils (such as olive oil) and some of the higher fat vegetables may actually be beneficial to our health. [20-25]

Upon close comparison, it would appear that the guidelines put forth in the BBHE would certainly bring us closer to the Paleolithic diet which our genes are dictating is of greatest benefit than those put forth by the 1992 DAFP as it currently stands. Perhaps, as a society, we would be better served to adopt the guidelines of the Building Blocks for Healthy Eating in place of those put forth by the 1992 USDA Food Pyramid.

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