Challenges to the Plant-Based Diet in the 90's

A Vegan Health Article from All-Creatures.org

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Although largely ignored by the media, and essentially absent from most people's daily awareness, the need to evolve our dietary choices towards plant-based foods - as individuals, as societies, and as co-inhabitants of this fragile planet - grows ever more urgent. Daily, topsoil blows and washes off farm fields worldwide, groundwater levels fall - and most ominous of all, the human population continues to balloon towards ten billion mouths to feed by the middle of the coming century. The land, water, and other resources needed to produce meat will inevitably grow much more costly. Arable acreage will necessarily be increasingly dedicated to growing plant foods which can be consumed directly by humans. It is a safe prediction that during the next few decades plant-based foods will come to constitute most or all of the protein and calories consumed by the majority of Earth's peoples - including those citizens of "developed" countries.

For most every pressing reason you choose to consider - personal health, ecological sustainability, economic stability, world hunger - we must start to learn as much as possible about how the human body functions when it is fueled largely or exclusively by plant-derived foods. A better understanding of vegan and vegetarian nutrition and physiology will permit the development of guidelines so that every person who chooses to nourish their body on purely vegetarian foods can do so with optimal benefits to their health.

What are the key questions in vegetarian nutrition? Over the last ten years, clinical experience and laboratory research have underscored the concept of biologic individuality. I have great interest in finding out why some people appear to do better on a pure vegetarian (vegan) diet while some have difficulty in maintaining it. The underlying, perhaps more primordial questions are, "Is Homo sapiens metabolically required to eat the flesh of other animals for optimal health and function?" "Are some Homo sapiens obligate carnivores and others not?" "Are there physical or laboratory markers that can identify people who are especially suited (or un-suited) to sustaining themselves on plant-based diets?" "Can nutrients consumed in animal-based foods be identified and successfully replaced by plant-derived foods?"

I believe we need to gather as much reliable data about these questions as possible. Through the Institute of Nutrition Education and Research, we will be conducting an in-depth, long-term nutrition study on the health effects of vegan diets. The research will consist of a registry to track thousands of vegans over many years to document the course of their health, as well as causes of their morbidity and mortality. We will also be conducting non-invasive laboratory tests on blood, urine, saliva, etc., of volunteers who consume vegan, vegetarian, and omnivore-type diets in order to explore key subjects in vegan physiology and nutrition, such as: protein requirements, blood type frequencies, mineral balance,
fatty acid metabolism, carnitine function, immune status, and many other critical areas.

**The Zone Diet**

When you do the mathematics, The "Zone Diet" program shows itself to be a low-calorie (approximately 1500 calories/day) diet with such a low carbohydrate content that the body is put into a constant state of ketosis. (Ketones are acidic waste products from fat breakdown.) People who run commercial weight loss programs (and who write popular diet books) have known for years that most everyone will lose weight on a low calorie, ketosis-producing diet - but this is not viewed as a healthy weight loss. Keeping the body in a constant state of ketosis places a large load of metabolic acid on the kidneys and liver that must be excreted over time, causing calcium loss from the bones, and possibly damaging the kidneys. Besides, no one will maintain themselves in a state of semi-starvation for more than a few days or weeks. Most everyone abandons low calorie diets after a while.

Flesh-heavy diets, like those recommended in "The Zone" and related books, can cause other serious health problems, such as fostering the growth of pathogenic organisms in the intestine, which can injure the intestinal wall and lead to the "leaky gut syndrome" - a condition of increased intestinal permeability which allows injurious fragments of antigenic food proteins and bacterial breakdown products to leak into the bloodstream (1). These foreign, inflammation-inciting substances can, in turn, exacerbate arthritis, lupus, and other autoimmune diseases in tissues throughout the body (2). The bacteria in the colons of people who consume whole foods vegan diets are far less likely to cause these kinds of diseases (3). Repeatedly packing the colon full of meat residue from a high protein diet has been shown to be highly correlated with cancer of the colon - among the leading killers of industrial nations (4). In fact, animal protein seems to be "high octane fuel" for the growth of many kinds of cancers(5). I fear that the apparent improvement experienced by many people who use the "zone" rationale to become big-time carnivores will ultimately be at the cost of damaged vital organs and more lethal degenerative diseases.

**The Blood Type Diet**

The "blood type diet" theory has gained widespread attention from the public since the release of "Eat Right For Your Type" by Peter J. D'Adamo, N. D. (G. P. Putnam's Sons, New York, 1996). The book's basic premise - that Type O's are the dominant, hunter-caveman type that require meat in the diet, that Type A's are docile vegetarians, while Type B's are dairy-eating omnivores - has become a manifesto for many people to rationalize including regular portions of meat and other animal products in their diet. ("After all, my ancestors did it.") However, the "blood type diet" theory, and the book that promotes it, presents many problems that prevent me from seriously basing any of my dietary choices upon them. One of the book's most disturbing characteristics is the frightening images that the author calls forth without providing scientific documentation. For example, D'Adamo hangs much of his theory on the action of lectins, proteins found on the surface of certain foods that can cause various molecules and some types of cells to stick together. He blames lectins for serious disruptions throughout the body, from agglutination of the blood cells to cirrhosis and kidney failure (page 24). He even scares the reader about these lectin "boogie men" with the tale of ex-KGB agent Georgie Markov who was murdered with an injection of the ultra-potent lectin, ricin. Then, on Page 53, D'Adamo states that, "...certain beans and legumes, especially lentils and kidney beans, contain lectins that deposit in your muscle tissues, making them more alkaline and less charged for physical activity." This is quite a serious scientific charge, and an alarming thought if you are blood Type O - namely, that after eating a bowl of bean chili or lentil stew, lectin proteins are depositing in your muscles and altering their function, changing their acidity, and diminishing your capability for physical action. If one is going to make a statement like that - and
publish it in a book destined for the New York Times bestseller list and intended to change the eating habits of a nation – I believe the author is obligated to present solid scientific evidence of supporting their assertions, which D'Adamo repeatedly fails to do. (An example of an author who presents credible proof is Dean Ornish, M.D., who published in his book the "before and after" photographs of X-rays demonstrating increased blood flow through arteries which had opened more widely after patients had participated in his diet and lifestyle program.) If an author is going to frighten millions of Type O readers about eating kidney beans, lentils, and wheat, I think they are obligated to provide verifiable evidence. To begin to convince me of the existence of his "lectin gremlins," he would have to publish photographs, taken through a microscope, of muscle tissue biopsied from people with Type O, Type A, Type B, and Type AB blood after they have eaten kidney beans and/or lentils. The photographs should clearly show the lectin deposits in the muscles of people with Type O blood - and not in the tissue samples from the muscles of people with Type A blood. If an author cannot produce proof like this, or clearly cite the scientific references in the text where other people have demonstrated such proof, his credibility, to me, is severely diminished. D'Adamo presents neither photos nor corroborating studies to support his speculations.

As for the rest of his statement regarding lectins changing the muscles, "making them more alkaline and less charged for physical activity," to substantiate that assertion the author would need to publish or cite studies wherein microelectrodes that measure acidity inside the cells were inserted into the muscles of people of various blood types. After they all ate a meal of lentils and kidney beans, if D'Adamo is to be believed, a significantly greater shift towards alkalinity should be seen in the muscles of the Type O subjects. Yet, no such studies are presented. If an author doesn't have this kind of proof, is it responsible for him to make statements that may frighten millions of people from eating high-protein, high-fibre legumes and other potentially valuable foods? It may indeed be best for a particular person not to eat a particular legume - but they should do so for solid nutritional/medical reasons (allergies, colitis, etc.) independent of their blood type. What finally pushes the "blood type" theory beyond the limits of believability for me is the primary mechanism of physiologic damage that D'Adamo postulates - namely, lectin proteins on some foods causing blood agglutination in certain people of blood types who are "not genetically/evolutionarily suited" to eat those foods. This is a very serious - and potentially life-threatening - phenomenon that he proposes. Agglutination means that the red cells in your bloodstream are irreversibly sticking together and forming clumps. Once they begin to clump together, they don't come apart. (Note that this is very different than blood sludging, or so-called rouleaux formation – a phenomenon seen when the surface of the red cells become coated with fat or other substances to make them sticky enough to temporarily and reversibly adhere to each other's surfaces - but not to become permanently bonded through irreversible intertwining of surface proteins, which is what happens in agglutination.) Having your blood agglutinate as it circulates through your body is not conducive to good health - or to long term (or short term) survival...

What is so bad about little clumps of red blood cells sailing through the bloodstream? Red blood cells deliver oxygen to the cells of vital tissues like the brain, heart and kidneys. To accomplish this delivery, they must flow through the tiniest of blood vessels - capillaries so narrow that the red blood cells must line up single file to get through. If the red cells are being agglutinated by lectins or anything else, clumps of red cells will clog up the capillaries and block the blood flow. Thus, the blood stream will be prevented from delivering its life-sustaining cargo of oxygen to the tissues served by those capillaries. Cells deprived of oxygen become damaged, and eventually die (cell death is called "infarction" of tissue.)

Since most people are unaware of their blood types, let alone what foods are
"evolutionarily inappropriate" for them to eat, it is reasonable to assume that on most days most people eat the "wrong foods" for their blood type (e.g., Type O eating wheat, Type A eating meat, etc.). Thus, according to D'Adamo's theory, most everyone experiences repeated showers of agglutinated red cells throughout their bloodstream after most every meal – day after day, month after month, year after year. If the capillary beds in your heart, lungs, kidneys, brain, eyes, and other essential organs are subjected to barrage after barrage of agglutinated red cells, they will eventually begin to clog up. These micro-areas of diminished blood flow would at first cause scattered, then more concentrated areas of tissue damage - with eventually many micro-infarctions scattered throughout these vital structures. The brain, heart, lungs, kidneys and adrenals would soon be irreparably damaged by these processes, resulting in potentially fatal outcomes in millions of people. Such a syndrome of organ failures due to lectin-induced micro-infarctions of the brain, heart, kidneys, retinas, and adrenals would be well known to pathologists and other medical scientists. It would not be a subtle disease. In the pathology texts, there would be clear descriptions - complete with photographs taken through high-power, optical microscopes as well as electron microscopes - of damage from lectin deposits and blood agglutination in most major organ systems. The existence and intricacies of such a widespread disease would be as common knowledge among physicians and cell scientists as atherosclerosis is today. Yet, I am aware of no such descriptions in the pathologic literature. No pathologist I know has ever mentioned tissue infarction from lectin-induced red cell agglutination as a cause of any disease in humans. So when I read a "one size fits all" statement like on page 63, "Type O's do not tolerate whole wheat products at all," I have to ask, "What does he mean, 'at all'?" Do Type O's eat a whole wheat cracker and fall on the ground holding their abdomen and vomiting - or worse yet, suffer immediate brain damage due to their blood cells agglutinating throughout their brain? How much wheat can a Type O eat before their blood agglutinates? One hamburger bun? One noodle? I'm not denying that many people do experience problems when they eat wheat. They do, but they do so because they have a true wheat allergy, gluten intolerance, or some other verifiable mechanism - not because of some sugar and protein molecules sticking up from the surface of their red blood cells. Like D'Adamo, I grant that wheat can be a problematic food for people with colitis, and I often recommend eliminating it from the diet. Lectins may even play a role in the inflammatory process for some people. However, before one tells millions of individuals with Type O blood to never eat whole wheat - many of whom apparently have no difficulty with whole wheat and who rely on breads as a major source of energy and protein - isn't some convincing scientific proof required? I feel that author D'Adamo at least owes his readers a text citation with supporting evidence that wheat-induced colon dysfunction is a condition peculiar to Type O's. Yet, his text is devoid of scientific endnote citations.

To convince me, he would need to show me photographs of intestinal tissue from Type O people who have recently eaten wheat and who clearly have evidence of lectin agglutination clogging up the function of their intestinal cells. I would also need to see pictures of tissue biopsies from Types A, B, and AB whose intestinal walls are seen to be undamaged and far less burdened with lectin deposits than those with Type O blood. As far as I know, inflammation of the intestine, like colitis, Crohn's disease, and gluten sensitivities, occurs in people of all blood groups, not just Type O - and D'Adamo cites no convincing proof to the contrary. Author D'Adamo also makes three hard-to-believe statements concerning dairy products – two which made me doubt his understanding of basic science and one that raises concerns about the safety of his nutritional advice:

1.) D'Adamo states on Page 23 that, "If a person with Type A blood drinks it (milk), his system will immediately start the agglutination process in order to reject it." If he wants me to believe a statement like that, he had best show me pictures of Type A blood cells under the microscope agglutinating after the person drinks milk, wherein Type O and Type B blood cells are shown not to agglutinate. He again shows no
such photos or other believable evidence of the phenomenon. D'Adamo would also have to explain why Type A people who drink milk (sometimes-massive quantities of it) do not suffer strokes and emboli as their blood agglutinates throughout their vascular system. He presents neither proof nor even plausible explanations for the above - very troubling in a book presented as "based on science."

2.) On page 151, D'Adamo states that, "...the primary sugar in the Type B antigen is D-galactosamine, the very same sugar present in milk." Actually, the primary sugar present in milk is not D-galactosamine, but rather, lactose. Lactose is a very different molecule than D-galactosamine, with very different chemical properties. Even if there were significant amounts of D-galactosamine in cow's milk, the antibodies in a Type A person's blood that agglutinate with a Type B person's blood cells do so by reacting not with D-galactosamine alone, but with a molecule of D-galactosamine combined with a molecule of the sugar, fucose, projecting from the surface of the red blood cell. Just because Type A antibodies will agglutinate with D-galactosamine+fucose on the surface of a Type B red cell, does not mean Type A blood will agglutinate with the lactose (or even free D-galactosamine) in cow's milk. (It is recognized that people of any blood type may react badly to cow's milk and other dairy products - for a variety of reasons, but likely not because lectins in the milk are agglutinating their "wrong" type blood cells.)

3.) A statement that causes me great concern regarding the safety of D'Adamo's dietary advice appears on page 37, where, despite widespread knowledge that many non-Caucasians are intolerant of dairy products due to the normal disappearance of lactase enzymes in their intestinal cells, D'Adamo recommends that "Type B's of Asian descent may need to incorporate them (dairy products) more slowly into their diets as they adjust their systems to them." This seems like strange counsel from an author trying to improve the intestinal health of his public. I fear that the consequences for many of his unsuspecting, lactase-deficient readers who follow such advice will be severe bouts of abdominal cramps and diarrhea. Another assertion in this book that make me not want to recommend it to my patients is on page 53, where D'Adamo writes that: "This condition, called hypothyroidism, occurs because Type O's tend not to produce enough iodine." The reality is that the body does not "produce" iodine at all, any more than it produces calcium, magnesium, sodium, or any other earth mineral. Iodine is a halogen element, related to chlorine and bromine, which is taken up by plants from the soil and in the sea – which are then consumed in the diet. To worry tens of millions of Type O readers that they "may not be producing enough iodine" (which no one does) and are thus at risk for hypothyroidism, is unfounded and, I feel, unnecessarily worrying. The causes of clinical hypothyroidism are complex issues, probably involving autoimmune and other mechanisms of injury to the thyroid tissue. To imply that eating red meat and avoiding wheat (a "Type O diet") will help the Type O person "produce iodine" is unsubstantiated and may not only raise false hopes in the reader, but may also increase the risk of meat-associated diseases. Also disturbing is D'Adamo's portrayal of people of vegetarian persuasion. Where in the book, he tells flesh-eating Type O's that they have a "genetic memory of strength, endurance, self-reliance, daring, intuition, and innate optimism...", "the epitome of focus, drive...", "hardy and strong, fueled by a high protein diet" (is he describing a Type O "master race"?), he paints the "more vegetarian" Type A as submissive tofu eaters, "biologically predisposed to heart disease, cancer and diabetes" (p. 97). He paints Type A's with personalities "...poorly suited for the intense, high-pressured leadership positions at which Type O's excel" (p.142), stating that, in pressure situations, people with Type A blood "tend to unravel" and "become anxious and paranoid, taking everything personally." Finally, on page 143, he saddles the group with the dark image of Adolph Hitler, "...a mutated Type A personality." D'Adamo's system seems to create a "blood type astrology" ("What's your type? O Positive? I knew it! So am I!") that imposes strange, limiting stereotypes on very complex human beings.

Remember, there is nothing sacrosanct about the ABO blood typing system
devised by Dr. Landsteiner in the 1920's. It is only one system classifying more than thirty proteins on the surface of cells that determine other blood groups, with names like Auberger, Diego, Duffy, I, Kell, Kidd, Lewis, Lutheran, MNSs, P, Rh, Sutter, and Xg. This means that food selections that may be "right" for the ABO blood group system might be "dead wrong" for someone's Kell or Kidd antigens. Why are we deifying the D-galactosamine-fucose molecules on the red cell surfaces that determine ABO Type?

In my opinion, D'Adamo has spun an evolutionary fairy tale that leaves many unanswered questions. What exactly is he proposing happened to Type O hunter-gatherers when the Type A people began growing wheat, barley and other grains? Do Type O people eat a mouthful of barley and fall down in the dust, unable to work and reproduce? Do they then become warlike and club the agrarian people to death because lectins are clogging their intestines? Do the genetic changes to Type A blood type magically appear just before a society grows new grains (allowing them to eat the new grains in the first place), or did Type A blood types emerge after the grains are grown, as the people with Type O blood died out from their blood agglutinating in their brains? And why would so many of the native Indians of North America, classic Type O hunters, go to the trouble of cultivating high-lectin corn (maize)? Someone talk some science to me, please... Is the blood type the ultimate determinant of successful adaptation to a particular dietary style? How do we explain the experience of people who say, "I tried to be a vegetarian and it didn't work for me - so I added some meat back into my diet and I feel better. I guess I'm a Type O caveman," or "A practitioner of 'live cell' analysis stuck my finger and I saw my blood agglutinate! He said I must have eaten foods wrong for my blood type!" I hear variations of these two statements several times per year. Do either of these phenomena validate D'Adamo's blood type theory?

First, the red cell clumping on the TV screen... I have walked through many medical meetings and health expos and seen this demonstration set up and performed many times. A subject's finger is punctured and a drop of their blood is placed under the microscope slide with the image projected on a large screen or television monitor. The results can appear quite dramatic as a person often sees on the TV screen their red blood cells, platelets, and other cellular elements apparently misshapen and clumped together. It can then be an opportune time to convince the startled person that their blood is laden with toxins or deficient in vital minerals or some other nutrient - and then sell them the "necessary" supplements that the "live cell analyst" happens to be purveying.

Though the images may be graphically convincing, the unsuspecting subject is probably unaware that they may have just witnessed a biological parlor trick. The "live cell analyst" has probably failed to inform them that the "agglutinating" effect seen on the screen can be produced by a number of factors, most having nothing to do with lectins, blood type, or any other forces beyond the physics and chemistry of a drop of blood on a slide. Remember, that a drop of blood on the microscope slide is very different than a drop of blood flowing through your bloodstream.

While flowing naturally through the bloodstream within the arteries and veins, the blood is shielded from light, is held at a constant temperature of 98.6 F., is under much higher pressure than room air, and is physically moving very rapidly through the "piping" system of blood vessels. These are all factors which profoundly affect the surface characteristics of the red blood cells, making them less likely to stick together. The red cells' rapid motion through the bloodstream also prevents antibody fixation, blood clotting factor activation, and other pro-agglutinating forces from exerting much effect. When the drop of blood is squeezed out onto the microscope slide, all these factors are changed or eliminated. At that point, physical forces - cooler temperatures, lower pressure, exposure to light, physical stagnation, activation of enzyme systems, etc. - begin to affect the blood on the slide in ways that may make it much more likely that the cells may begin to clump together - independent of blood type or presence of lectins. In addition to the above purely
physical influences, other chemical factors may be at work on the slide to create the appearance of clumping - independent of the person's blood group. These chemical agents include:

1. The person's last meal. In particular, the fats from the egg yolk at breakfast or the olive oil in the salad dressing at lunch may be invisibly coating the red blood cells, making them stickier and more likely to adhere together. Fats will make red blood cells of all blood types sticky and more likely to clump together. In my experience, "live cell analysts" seldom ask the subject about their last meal nor analyze it for the fat content.

2. Antibodies (immune proteins that can bind to cells) left over from a recent viral infection or allergic reaction - but not associated with food lectins - can coat red blood cells and make them prone to clump together.

3. Molecules with unknown chemical properties, introduced into our blood from living in the "civilized world" - such as food colorings, food preservatives like BHT (butylated hydroxytoluene), hydrogenated oils eaten in fast foods, snacks, and restaurant meals, as well as birth control pills, aspirin, cold medications, and over-the-counter remedies, etc. - may affect the tendency of blood cells to clump, independent of lectins or blood type.

4. The acidity (pH) of the blood, the levels of calcium, sodium, and other circulating minerals - even the concentration of salt in the "saline solution" that the "live cell analyst" mixes with the drop of blood - can all dramatically affect its behavior and appearance on the slide. Add to this the effects of exercise, medications, even a prolonged time since the last drink of water – it's no wonder the blood on the slide might look strange. There are hundreds of unseen forces acting upon the red blood cells, platelets, and suspended plasma proteins. Under some conditions, the blood cells of some individuals might even tend to clump together when viewed on the television screen. However, this does not mean that individual is ill, suffering from a nutritional deficiency, or is being agglutinated internally from the lectins in their diet. Unfortunately, this is often not the message they receive from the "live cell analyst" about to make a recommendation as to which one of their proprietary supplements to buy in order to remedy the "condition."

(This is not to imply that all people performing "live cell analysis" are unscrupulous, but only that the technology creates a powerful imagery and it is easy to abuse. There seems to be quite a number of people demonstrating the televised technique for the public who are unaware of the subtleties of the blood stream and the body - and thus not qualified to make clinical diagnoses based upon what they are seeing on the TV monitor. Yet, it is very easy for "a live cell analyst" - for reasons altruistic, capitalistic, or otherwise – to issue an ominous-sounding term or diagnosis to an unsuspecting member of the public. I have had several people consult me, worried that their blood was agglutinating inside their arteries, or that their "immune system was shot," based upon comments made at a health expo by a "live cell analyst" - who had received little more than a weekend training course. The public should be made aware of the limitations of the "live cell analysis" technique, so they are not unduly frightened by what they may see on the screen or hear from the analyst.)

What of the people who say they feel better when they resumed flesh eating after intervals of consuming vegetarian or vegan diets? Unquestionably, their experiences have some important messages for us. But what are they? Here are some possibilities... It is known that, in some people, merely adjusting the proportions of proteins, fats and sugars in any manner significantly new to their body can produce noticeable improvements in the way they feel. Changing the proportion of raw vs. cooked foods can similarly have beneficial effects. Some people who feel that their health has improved after adopting a "zone" or "blood
type” diet may actually be benefiting from just eating less carbohydrates, more protein, etc. We plan to investigate whether some of the individuals who re-introduced animal products into their diet could have achieved similar effects by altering their selection and quantities of plant-based foods. We recognize that there are significant metabolic differences between people. It may well be that some of these differences may propel certain individuals towards flesh consumption. It may be, however, that the cause is not so much genetic, as acquired after birth. Remember, virtually every person who reports adding meat back into a previously vegetarian diet is an individual who was raised on a meat-based diet.

Why is this important? The kind of foods one eats in their early years may set biochemical patterns that last for a lifetime. For example, the human body can synthesize from simpler molecules some essential substances like carnitine (required for energy production) and some long-chain fatty acids (EPA, DHA, etc., needed for hormone function, membrane synthesis, etc.). People who eat meat ingest these substances, pre-formed, in the muscles and other animal tissues they consume. It may be that the body of a person raised as a life-long omnivore becomes functionally dependent upon a diet that contains these pre-formed nutrients. As adults, if they suddenly change to a completely plant-based style of eating, where the foods are essentially devoid of pre-formed carnitine, EPA, DHA, etc., they may find themselves in a body with enzyme systems unable to synthesize all the energy-generating compounds, fatty acids, and other molecules they may require.

After months or years on a flesh-free diet, these individuals might experience deterioration of their health or energy - only to feel better upon resumption of meat ingestion. To the person, this may seem like confirmation that they are "natural meat eaters." Rather, it may be evidence of an acquired dependency on flesh-borne nutrients formed through early eating patterns. If this is the case, it may be possible to prevent, repair, or at least compensate for these imbalances through provision of additional nutrients, removal of inhibiting substances in the diet, varying combinations of food, etc., utilizing foods of plant-based origin. There is much to learn about the subject and much research needs to be done.

In my experience, these problems are not encountered in people raised on vegetarian diets from infancy. This effect might be especially pronounced in long-term omnivores who make an abrupt change to a vegan diet, as opposed to those who taper flesh foods out of their diet more gradually. It may be that some “omnivore-from-birth” people who desire to sustain themselves on a vegan diet may have to make a more graded transition to completely plant-based foods, sometimes over several weeks or months, to give the body time to “gear up” its metabolic machinery. In other words, what appears to be a “natural need for meat” may really be the need for an attenuated weaning process from animal products in order to overcome metabolic patterns begun early in life, created largely by cultural practices.

Through the Institute of Education and Research, we plan to study these phenomena in detail and will attempt to identify any nutrients that may be required in larger amounts when consuming vegetarian diets. A goal of our research is to develop science-based guidelines to aid anyone who chooses to nourish their body on exclusively plant-based foods to do so with optimal benefits to their health and well being. An additional thought: Less than optimal function on a plant-based diet (or any diet) may not stem from a “lack of meat” or a nutrient deficiency at all, but rather from an individual’s other health conditions, like digestive dysfunction, malabsorption by the intestine, parasite problems, adverse immune reactions, etc. To me, these are far more likely mechanisms that could explain the “failure-to-thrive” syndrome occasionally seen in vegetarians and vegans - rather than a genetic mandate to consume flesh determined by their blood type. Much more research is needed to obtain the answers to so many questions in this essential but
subtle science.

Beyond the "blood type issue," perhaps a deeper question about any book which advocates a meat-based diet for the majority of the population is, "In today's world, is eating meat, in any form, safe?" It appears that to base one's diet around animal foods is becoming a high-risk activity, similar to unsafe sex or driving without wearing a seat belt. Consider the smorgasbord of health hazards available at today's meat counters… It's a safe bet that virtually every cut of "fresh" meat produced commercially in North America today contains:

Residues of hydrocarbon pesticides and herbicides, linked to cancers and birth defects,

Residues of antibiotics and growth-augmenting sex hormones fed to the animals and stored in their tissues, Fecal microbes, like the potentially lethal E. coli 0:157 and Salmonella bacteria. (Hamburger roulette, anyone?)

The nightmare specter of the brain-destroying prion protein, the cause of spongiform encephalopathies - "mad cow disease" in bovines - Creutzfeldt-Jacob disease, or CJD in humans. (I feel sadly certain that what occurred in England with mad cow disease will probably occur here in North America and other parts of the world within in the next two years. I sincerely hope I'm wrong.) Given these ever-increasing risks connected to meat consumption, I fear that the theories and books that attempt to justify and promote the eating of flesh - for whatever reason - could be opening the floodgates of ghastly epidemics five or ten years from now. These plagues likely will have a magnitude that will dwarf everybody's concerns about "being in the zone" or eating "right for your type."

Finally, no matter what advocates of animal-based diets might say about the merits of being in the "zone" or "eating right for your blood type," from an ecological standpoint, a meat-based diet for the world's population is non-achievable and, for even a sizeable minority, is non-sustainable. The world's soils, waters, and forests are being decimated to produce meat-based diets. We are destroying the life support systems of our planet - of our children's planet - for a mouthful of flesh. To me, the promotion of diets centered around meat increases the chances of ecological catastrophes and thus jeopardizes each of our futures.

I wish for everyone optimal health, happiness, and longevity. We owe it to ourselves, to our children, and to all who come after them, to see how optimal function and life span can be achieved on diets that are truly sustainable - for individuals, for societies, and for the planet. It is, after all, the food of all our futures.

REFERENCES:


The Plant-Based Advantage also explains how unchecked inflammation can not only prolong recovery times between workouts and competitions, but can also increase joint pain and risk of disease. People who train or compete frequently, especially in endurance activities that rely upon thousands of repetitive motions (or, in the case of Scott Jurek’s 2200-mile run featured in The Game Changers, millions), are at higher risk of repetitive stress injuries and degenerative joint diseases (14-16). While many people might consider this a challenge to achieve on a plant-based diet, research has shown that endurance athletes who don’t consume meat get the same amount of protein per pound as those who do (10,35). Plant-based diets have been associated with reduced risk of certain cancers, high blood pressure, high cholesterol, and hyperglycemia, as well as lower body fat and body mass index, says Calabasas, California–based Julieanna Hever, RD, author of The Healthspan Solution: How and What to Eat to Add Life to Your Years. However, setting parameters for yourself is going to help you stick to the plan while pushing you to try new recipes, dishes, and ingredient combinations, says Wolfram. For instance, she says, declare one day meatless (e.g., meatless Monday), bring vegetarian lunches to work during the week, or decide to eat all breakfasts and lunches meatless (saving meat for dinner). To find the best choice for you, consider your lifestyle, resources, and eating preferences, she says. Nearly 90% of Americans fall below fruit and vegetable consumption recommendations. Yet eating vegetables is essential to get the nutrients our bodies require to feel energized, function properly and fight disease. Including an abundance of vegetables in our diets can prove challenging, especially if you didn’t grow up eating them regularly or you feel overwhelmed at the idea of chopping, peeling and otherwise prepping them on a busy weeknight. However, with a little strategy, vegetables can be an enjoyable and easy addition to any meal. Shred vegetables like carrots, zucchini and spinach and add them to the batter when you bake muffins, brownies, quick breads, pancakes and waffles. Batch prepare vegetables.