The Plant-Based Paradox: Why Vegan Diets Conflict with Human Biology

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Section 1 - Addressing The Great Plant-Based Lie…

Introduction

In recent years, a long festering ideological dogma has gained increased and widespread cultural traction – veganism, rebranded as the 'plant-based movement', has been propelled into the mainstream by influencers, health authorities, and global institutions which now frequently and erroneously promote the plant-based approach as 'optimal' not only for individual well-being but for planetary survival. In fact, what we see pushed today as the 'plant-based agenda' is the amalgamation of three previously distinct ideological movements, namely: animal rights, climate change, and veganism.

Documentaries such as *What the Health* (2017) and *The Game Changers* (2018) have contributed to a widespread perception that the vegan diet is superior for human beings - cleaner, safer, and more ethical – but these are steadily being proven to be nothing more than ideological propaganda, as an ever-growing body of evidence challenges the idea that an entirely plant-based diet is physiologically appropriate, or even safe, for human beings because it conflicts with a substantial body of nutritional, physiological, and evolutionary science.

This essay argues that vegan and strictly plant-based diets are fundamentally misaligned with human biology, pose significant risks when adhered to long-term, and are especially hazardous for physiologically vulnerable populations: infants, children, and the elderly. While short-term improvements in weight, blood sugar, or cholesterol may occur in comparison to the standard western diet rich in processed and ultra-processed foods, these perceived benefits do not reflect the diet's capacity to sustain optimal health across a lifetime. Indeed, the nutritional limitations inherent to veganism - especially the absence or poor bioavailability of many essential nutrients - may result in cumulative damage, often manifesting only after years of sustained deficiency.

To be clear, this critique is not an argument for unrestricted consumption of ultra-processed products, animal or otherwise, nor does it deny the value of some plant foods in a supplemental capacity within a species appropriate diet for human beings. Rather, it confronts a growing ideological trend: the presumption that the complete exclusion of animal-derived foods is a healthy, evolutionary-appropriate, and universally applicable solution. This presumption is not only scientifically flawed but can be actively harmful when applied dogmatically - especially in developing children and the aging population and therefore warrants challenging!

Definitions and Clarification

For the purposes of this essay, the term vegan diet refers to a diet that excludes all animal products, including meat, fish, dairy, eggs, and often honey. A plant-based diet, while sometimes more loosely defined, typically refers to a dietary pattern where plant foods dominate and animal products are minimized or excluded. Though the terms are often used interchangeably in media and public discourse, they differ in strictness and intent. However, this essay focuses both on strict veganism and highly plant-dominant diets as well because many concerns raised are common to both.

The Rise of the Plant-Based Movement

Several factors have catalysed the rise of veganism: growing public concern over industrial animal agriculture, increasing awareness of climate change, and the belief that plant-based diets reduce the risk of chronic diseases such as cardiovascular disease, cancer, and type 2 diabetes. Market data reflects this trend: global plant-based food sales are projected to surpass $100 billion by 2030 (Bloomberg Intelligence, 2021). Institutions such as the EAT-Lancet Commission (Willett et al., 2019) have proposed global dietary shifts toward plant-based eating, citing sustainability and population health.

Yet these recommendations often assume that all nutrients found in animal foods can be easily and safely replaced by plant-based alternatives or supplements. This is a dangerous oversimplification. Not all nutrients are created equal, and many essential compounds found in animal-sourced foods - such as vitamin B12, heme iron, preformed vitamin A (retinol), long-chain omega-3 fatty acids (DHA and EPA), creatine, carnosine, taurine, and vitamin K2 - either do not exist in adequate or bioavailable forms in plants or are present in amounts insufficient to meet human needs, particularly under stress, growth, or aging conditions (Rogers et al., 2022; Baroni et al., 2018).

Evolutionary Context and Physiological Design

Human beings did not evolve as herbivores, nor as ‘true’ omnivores. The archaeological and biological record strongly supports the view that animal foods played a central, even indispensable, role in the development of the human brain, physiology, and metabolic system (Larsen, 2003; Lieberman, 2013). The development of smaller colons, increased stomach acidity, a high energy budget, and specific nutrient transport mechanisms all indicate a digestive tract adapted for nutrient-dense animal products – Human beings are in fact shown to be Hypercarnivores according to the study of our trophic level and digestive function (Ben-Dor et al., 2021). Modern vegan and plant-based diets are a cultural innovation, not an ancestrally appropriate way of eating - arguably, they represent one of the most radical nutritional experiments of modern history.

Hidden Dangers of a Seemingly Healthy Diet

Much of the appeal of veganism comes from its association with ethical purity, environmental consciousness, and dietary cleanliness, but these psychological and ideological drivers can obscure critical biological truths. While deficiencies in nutrients such as B12 or iron are well-documented in vegans (Pawlak et al., 2013), the deeper issue is not just individual nutrients but nutrient synergy, meaning how whole foods work together to support immunity, cognition, fertility, and resilience.

There is also the issue of latency because nutrient deficiencies do not always produce immediate symptoms. The human body is adept at compensating and depleting internal stores for years before dysfunction surfaces. By the time symptoms such as fatigue, impaired cognition, menstrual irregularity, stunted growth, or immune dysfunction appear, long-term damage may already be underway (Hertzler et al., 2020).

High-Risk Populations: Infants, Children, and the Elderly

Nowhere are these risks more acute than among the most physiologically vulnerable. Vegan and plant-based diets have been associated with impaired growth, lower bone density, and cognitive deficits in children and adolescents (Desmond et al., 2021). In the elderly, reduced nutrient absorption, increased protein requirements, and the threat of sarcopenia make animal-derived nutrients critically important (Bauer et al., 2013). While many vegan advocates argue that appropriate supplementation can offset these issues, this premise assumes high levels of education, access to fortified products, rigorous dietary planning, and individual compliance - conditions that are often absent in real-world settings and therefore not practical mitigations.

Purpose and Structure of the Essay

This essay synthesizes research from evolutionary biology, nutritional science, and clinical medicine to present a comprehensive critique of vegan and plant-based diets. The structure is as follows:

- **Section 2 -** examines human evolution and dietary adaptation.
- **Section 3 -** unpacks specific nutrient deficits in vegan and plant-based diets, including their bioavailability.
- **Section 4 -** analyses the impact of veganism and plant-based approaches across the lifespan, focusing on infants, children, adults, and the elderly.
- **Section 5 -** critiques the reliance on supplementation and fortification to mitigate inherent shortcomings.
- **Section 6 -** explores the ethics and environmental claims often used to promote veganism.
- **Section 7 -** addresses ideological bias and the illusion of consensus in nutritional science.
- **Conclusion -** concludes with a call for dietary realism grounded in biology, not ideology.

In challenging the prevailing narrative, this essay does not deny that some individuals may thrive temporarily on vegan or plant-based diets, especially in comparison to modern western dietary patterns high in processed and ultra-processed foods. It argues instead that when viewed through the lens of long-term human biology and real-world outcomes, such diets are not sustainable or safe across the general population - particularly for those who can least afford nutritional compromise.

Section 2: Human Evolution and Dietary Adaptation

To assess the appropriateness of vegan or plant-based diets for human beings, one must begin with an evolutionary perspective. Humans are not recent inventions; our physiology, nutrient requirements, and digestive systems are the product of over 2.5 million years of hominin evolution, during which the regular consumption of animal-sourced foods was not only typical - but it was also pivotal!

Evolutionary Pressures and Nutritional Demands

The genus *Homo* emerged around 2.5 million years ago with *Homo habilis*, marking the beginning of a profound shift in dietary strategy. Compared to our great ape relatives, early humans had relatively small guts, increased brain size, and greater energy demands - all adaptations that point to a shift toward nutrient-dense, calorie-rich animal foods (Aiello and Wheeler, 1995). This "expensive tissue hypothesis" posits that the energetic costs of a larger brain were offset by a reduction in gut size, made possible only by consuming foods that were easier to digest and more energy-rich than fibrous plant matter.

Animal foods – which are rich in bioavailable protein, iron, zinc, and long-chain fatty acids - were likely indispensable to this evolutionary leap. For instance, docosahexaenoic acid (DHA), a long-chain omega-3 fatty acid abundant in marine foods, is a crucial component of the human brain and retina yet is largely absent in terrestrial plant foods (Kuipers et al., 2012). The synthesis of DHA from its plant-based precursor (alpha-linolenic acid) is horribly inefficient, especially in infants and during periods of rapid brain development (Brenna et al., 2009).

Anatomical and Digestive Evidence

Humans possess digestive systems that reflect a reliance on high-quality, nutrient-dense animal sources of food. Compared to herbivores or true omnivores, humans have:

- **A small colon-to-small-intestine ratio**, favouring nutrient absorption via auto enzyme based digestion rather than fermentation (Milton, 1999).

- **High gastric acidity**, comparable to scavengers and carnivores, which evolved to kill pathogens found in animal tissues (Beasley et al., 2015).
- **Limited capacity to detoxify plant secondary compounds**, many of which require microbial fermentation or enzymatic adaptations that humans lack (Carmody and Wrangham, 2009).

These features indicate that humans are not natural herbivores, nor even textbook omnivores in the classical mammalian sense. Rather, humans evolved as opportunistic hypercarnivores with a fallback capacity for digesting some plant foods to stave off starvation in times of scarcity - a model supported by both modern ethnographic data and recent isotopic analyses (Ben-Dor et al., 2021).

Stable Isotope and Archaeological Evidence

Stable isotope studies of Neanderthal and Palaeolithic Homo sapiens remains reveal trophic levels comparable to apex predators, with diets rich in large herbivore meat (Bocherens, 2011). Even Palaeolithic populations with access to wild plants did not subsist on them. Isotope ratios of carbon and nitrogen in fossilized collagen indicate heavy reliance on animal protein for over 90% of caloric intake in some Upper Palaeolithic groups (Richards and Trinkaus, 2009).

This pattern is echoed by archaeological evidence showing:

- Butchering tools and marrow extraction from long bones.
- Fire use to cook and render fat digestible (Wrangham, 2009).
- Selective hunting of large herbivores over small prey (Stiner et al., 2000).

Fossilized dental calculus also reveals that even when plant foods were consumed, they were likely seasonal or supplementary rather than primary energy sources.

Ethnographic Evidence from Modern Hunter-Gatherers

Contemporary hunter-gatherer societies - though diverse and shaped by geography - consistently obtain a significant proportion of their calories from animal foods. In a landmark review of 229 hunter-gatherer societies, Cordain et al. (2000) found that 68–85% of dietary energy came from animal sources, with only 15–32% from gathered plant matter. No known traditional society has ever been documented to follow a completely plant-exclusive diet.

Groups like the Inuit, Maasai, Hadza, and Kung all consume animal-sourced foods when available. Even among foragers in tropical environments where plant diversity is high, animal foods remain highly sought after due to their nutritional density. The universality of this pattern across continents and climates suggests that animal consumption is not a cultural fluke - it is a human universal driven by biological necessity.

Evolution of Brain Size and Nutrient Density

The dramatic tripling of brain size in the *Homo* lineage - from *Australopithecus* (~450cc) to *Homo sapiens* (~1,350cc) - coincides with increased meat consumption, fire use, and the development of tools for processing animal carcasses. This brain expansion required not just energy but specific nutrients like:

- **Preformed vitamin A (retinol)** – found only in animal liver and fats.
- **Heme iron** – necessary for oxygen transport and neural myelination.
- **Creatine** – vital for ATP buffering in neurons and muscle.
- **Taurine and carnosine** – antioxidants and neurotransmission modulators.
- **Vitamin B12** – absent in plants and essential for DNA synthesis and neurological function.

These nutrients are either unavailable or poorly bioavailable in plant foods, and their absence leads to irreversible developmental and cognitive deficits when deficient during early life (Allen, 2008).

Mismatch with Modern Vegan Diets

The contemporary vegan diet, even when supplemented and well-planned, represents a radical departure from the diet to which humans are biologically adapted. Modern humans have not evolved the enzymatic machinery or metabolic pathways to convert plant-based precursors into adequate amounts of several essential nutrients. Moreover, many plant foods in the modern diet are novel cultivars with altered nutrient profiles and increased antinutrient loads compared to their wild ancestors which further complicates matters.

Even the caloric structure of modern veganism and plant-based approaches - often high in carbohydrates and low in saturated fats and protein - is alien to the human evolutionary template, which favoured fat-rich animal tissues (Speth, 1989). Given this mismatch, it is unsurprising that many long-term vegans experience declines in metabolic health, hormonal balance, fertility, and psychological resilience over time.

The Hypercarnivore Perspective

A recent synthesis by Ben-Dor et al. (2021) argues that humans were positioned near the top of the trophic chain for over two million years, functioning as hypercarnivores during most of the Pleistocene. This perspective is based on multiple converging lines of evidence:

- Trophic level modelling using nitrogen-15 isotopes.
- Low variability in energy extraction strategies compared to omnivores.
- Late adoption of plant food processing technologies.

- Morphological adaptations favouring meat digestion over fibre fermentation.

This framework challenges the conventional “omnivore” model and suggests that the human lineage adapted to prioritize animal foods and fat as its primary energy source - a pattern fundamentally incompatible with a plant-exclusive model.

Key Takeaway for Section 2

The totality of evolutionary, anatomical, and ecological evidence makes one point clear: human beings evolved to rely on animal-sourced foods not only for survival but for optimal development, fertility, cognition, and longevity. While humans have the flexibility to include plant foods supplementally, the idea that a wholly plant-based diet could support these functions across the lifespan is biologically untenable. Veganism is not consistent with our roots - it is an unprecedented nutritional experiment that disregards the core tenets of our species' dietary evolution.

Section 3 - Critical Nutrients Unavailable or Poorly Bioavailable in Vegan Diets

One of the strongest scientific critiques of vegan and strict plant-based diets lies in their inability to provide several essential nutrients in adequate, absorbable, or bioactive forms. These nutrients are not fringe or optional - they are mandatory and central to immune function, brain development, metabolic regulation, fertility, and long-term resilience. While many plant-based advocates argue that these can be compensated for through careful planning or supplementation, this claim often fails to reflect the biological complexity of nutrient absorption, conversion, and interaction within the human body. It also assumes a level of dietary literacy and compliance that is far from practical in real-world settings.

This section explores the most commonly deficient or poorly absorbed nutrients in vegan and plant-based diets, their physiological importance, and the limitations of plant-based alternatives.

Vitamin B12

Vitamin B12 (cobalamin) is essential for DNA synthesis, red blood cell formation, and neurological integrity. It is produced only by microorganisms and accumulates naturally in animal tissues. There are no reliable plant-based sources of B12. Seaweeds, algae, and fermented foods often contain analogues (pseudo–B12) that are inactive in humans and may even interfere with B12 absorption (Watanabe and Bito, 2018).

Deficiency can take years to manifest but may result in peripheral neuropathy, memory loss, depression, and irreversible brain damage, particularly in infants and the elderly (Pawlak et al., 2014). A systematic review found that up to 86% of adult vegans were B12 deficient or marginally deficient without supplementation (Rogers et al., 2022).

Heme Iron

Iron exists in two forms: heme (animal-based) and non-heme (plant-based). Heme iron, found in red meat and organ meats, is absorbed at a rate of 15–35%, compared to 2–20% for non-heme iron, depending on other dietary factors (Hurrell and Egli, 2010). Compounds such as phytates, polyphenols, and calcium, commonly found in vegan diets, inhibit non-heme iron absorption (Abbaspour et al., 2014).

Iron deficiency is the most common micronutrient deficiency globally, but vegans & followers of a strict plant-based diet - especially menstruating women and adolescents - are at even higher risk (Haider et al., 2021). Chronic deficiency can lead to anaemia, fatigue, impaired cognition, and reduced immune function.

Zinc

Zinc is critical for immune response, wound healing, taste, and fertility. While present in some plant foods (e.g., legumes, seeds), its bioavailability is significantly reduced due to the presence of phytates. Studies show that zinc absorption from plant-based meals can be up to 50% lower than from omnivorous diets (Hunt, 2003).

A review by Foster and Samman (2012) found that vegetarians and vegans consistently had lower serum zinc concentrations, particularly in men and children. Zinc deficiency has been associated with growth retardation, delayed sexual maturation, and increased susceptibility to infections.

Omega-3 Fatty Acids (DHA and EPA)

DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid) are long-chain omega-3 fatty acids critical for brain structure, mood regulation, and cardiovascular health. These are found predominantly in marine animals such as fatty fish and shellfish. Plant sources (e.g., flaxseeds, chia seeds) contain ALA (alpha-linolenic acid), a precursor that must be converted into DHA/EPA. Unfortunately, the human conversion rate is extremely low—often $<5\%$ for EPA and $<0.5\%$ for DHA, especially in men (Brenna et al., 2009).

Pregnant women, infants, and the elderly are particularly vulnerable to DHA deficiency, which has been linked to developmental delays, mood disorders, and cognitive decline (Innis, 2007). Algae-based DHA supplements are available but expensive and not commonly used in many vegan populations.

Vitamin A (Retinol)

Vitamin A exists in two forms: retinol (preformed), found in animal products like liver and egg yolks, and beta-carotene (provitamin A) in plants. The conversion of beta-carotene to retinol is genetically variable and highly inefficient in some individuals - particularly infants, those with diabetes, or those with specific SNPs in the BCMO1 gene (Tang et al., 2005).

Symptoms of deficiency include impaired vision, poor immunity, and infertility. WHO data shows that vitamin A deficiency is a leading cause of preventable blindness in children globally, a risk heightened by inadequate retinol intake during critical developmental windows (WHO, 2009).

Vitamin K2 (Menaquinone)

Vitamin K exists in two forms: K1 (phylloquinone) from leafy greens and K2 (menaquinone) from animal products and fermented foods. While K1 supports blood clotting, K2 plays a key role in calcium metabolism, helping direct calcium into bones and teeth rather than soft tissues and arteries.

Vegan diets are nearly devoid of K2 unless they include specific fermented foods like natto, which is rare in Western diets. Emerging evidence links low K2 intake to increased risk of osteoporosis and vascular calcification, especially in aging populations (Beulens et al., 2009).

Creatine

Creatine is found almost exclusively in animal muscle tissue. It plays a vital role in energy metabolism and brain function, acting as a phosphate donor in the ATP-PC energy system. Vegans consistently have lower muscle creatine concentrations, which can impair strength, anaerobic performance, and possibly cognitive processing (Rogerson, 2017).

Supplementation can restore levels, but creatine is not routinely included in vegan multivitamins or fortified foods, making deficiency likely among long-term adherents.

Carnosine and Taurine

Both carnosine and taurine are found almost exclusively in animal tissues. Carnosine functions as an intracellular buffer and antioxidant, while taurine supports bile salt formation, retina health, and central nervous system stability. While not classically “essential” (because the body can synthesize small amounts), endogenous production may be inadequate under physiological stress, during pregnancy, or in aging (Laidlaw et al., 1990; Chesney et al., 2010).

Plant-based diets supply negligible amounts of either, and the long-term implications of deficiency are not fully understood, but concern is growing, particularly for vegan children and pregnant women.

Calcium and Bone Nutrients

While calcium is found in some plant foods, its absorption is often impaired by oxalates and phytates, particularly in foods like spinach, rhubarb, and beans. Dairy products remain the most bioavailable source of calcium in Western diets.

A 2020 review found that vegans have lower bone mineral density and higher fracture rates than omnivores, even when calcium intake appears adequate (Iguacel et al., 2020). This may reflect synergistic deficiencies in calcium, vitamin D, K2, and protein.

Nutrient Synergy and Absorption Complexity

The issue is not merely whether plant foods contain these nutrients, it is how the body accesses and utilizes them. Nutrient synergy refers to the interdependent roles nutrients play in absorption and function. For example:

- Iron absorption is enhanced by animal protein and vitamin C but inhibited by phytates.
- Zinc competes with copper and iron for absorption.
- Vitamin A, D, and K2 function together in bone health and immune regulation.

Animal-sourced foods provide many of these nutrients in their activated, ready-to-use forms, with minimal inhibitors and optimal co-factors. Vegan diets, by contrast, often rely on isolated, synthetic supplements that fail to replicate this natural synergy.

Supplementation: A Necessary Compromise

Many of the nutrients listed above can be obtained through synthetic supplements, but this raises practical and philosophical concerns. A diet that cannot meet basic human nutritional needs without external pharmacological support cannot be considered biologically congruent or self-sustaining. While supplements may play a supportive role, they should not be structural requirements of a diet, especially one promoted as "natural" or "healthy".

Moreover, compliance with supplementation regimens varies widely. Studies suggest that many vegans either do not supplement consistently, or underestimate their needs, leading to widespread subclinical deficiencies (Schüpbach et al., 2017).

Key Takeaway for Section 3

Vegan and strict plant-based diets fail to deliver a full spectrum of essential nutrients in forms the body can efficiently absorb and utilize. While supplementation and food fortification can partially mitigate some of these deficiencies, they require constant vigilance, high nutritional literacy, and ideal conditions - not realistic expectations for most people, especially children, the elderly, or those with limited access to resources. This reality presents a hard limit to the safety, sustainability, and suitability of plant-exclusive diets as a long-term strategy for human health.

Section 4 - The Vegan and Plant-Based Diet and Its Risks Across the Lifespan

Nutritional needs vary across the human lifespan, shaped by rapid growth, hormonal shifts, immune development, reproductive cycles, and the physiological deterioration associated with aging. A diet may appear effective in one life stage but become inadequate or even dangerous in another. While vegan diets are often promoted as suitable “for all stages of life,” this sweeping claim does not hold up under scrutiny. It ignores the biological complexity and unique requirements of each developmental phase - particularly for infants, children, and the elderly - where nutritional sufficiency is not only critical, but unforgiving.

This section examines the specific risks posed by vegan and strict plant-based diets across the lifespan, highlighting the compounding dangers of long-term adherence in the absence of high-bioavailability nutrients.

Infants and Children

No phase of life is more sensitive to nutritional adequacy than infancy and childhood. During these years, the brain undergoes rapid growth, myelination, and structural development; the skeletal system mineralizes; and lifelong immune and metabolic set points are established. Nutrient deficits during this window - especially in B12, DHA, iron, zinc, and complete proteins - can lead to permanent developmental impairments that cannot be reversed later in life.

Breast milk naturally contains DHA, cholesterol, and saturated fat - nutrients absent in vegan infant formulas unless artificially added. Moreover, maternal veganism increases the risk of nutrient deficiency in breast milk, particularly B12, which directly affects the infant (Dror and Allen, 2008). Case studies have documented neurological regression, failure to thrive, and even death in infants breastfed by vegan mothers who were unaware of their own B12 deficiency (Clement and Brueton, 1994; Pawlak, 2013).

In young children, vegan diets often fall short on energy density, protein quality, calcium, zinc, and iron. A 2021 study comparing omnivorous, vegetarian, and vegan children found that the vegan group had lower bone mineral content, shorter stature, and less muscle mass despite adequate caloric intake (Desmond et al., 2021). Importantly, vitamin A and DHA intake were critically low, while 90% of children failed to meet recommended intakes for calcium.

While supporters argue that supplementation and food fortification can compensate, this places enormous reliance on parental knowledge, compliance, and access to specialty products - variables that cannot be assumed across populations or socioeconomic strata.

Adults

In early adulthood, many vegans report positive health markers such as improved digestion, weight loss, lower cholesterol, and perceived energy. However, these early changes often reflect the removal of ultra-processed foods, not the inherent superiority of a vegan diet. Over time - typically after 3 to 7 years - signs of nutritional depletion begin to emerge.

B12 deficiency becomes increasingly likely without aggressive supplementation. Iron status tends to decline more sharply in women due to menstruation. Zinc deficiency may manifest as acne, low libido, poor wound healing, and compromised immunity (Hunt, 2003). Long-chain omega-3 (DHA/EPA) depletion has been associated with mood disturbances, irritability, and cognitive “fog” - symptoms frequently reported anecdotally by ex-vegans, and increasingly investigated in clinical literature (Dyall, 2015).

Another area of concern is hormonal and reproductive health. Low-fat, low-cholesterol vegan diets may interfere with steroid hormone production, menstrual regularity, and fertility, particularly in women with low body fat (Wheatley, 2020). For men, studies have linked zinc and DHA deficiencies with reduced sperm count and motility (Zhang et al., 2018).

There is also the issue of protein quality. While total protein intake may appear adequate, plant-based proteins are often limiting in key amino acids such as lysine and methionine, and their digestibility is lower due to anti-nutrients. Muscle protein synthesis is less efficient without complete amino acid profiles, especially in those with higher activity levels or greater physiological demands (Phillips, 2016).

Finally, the long-term metabolic consequences of high-carbohydrate vegan diets - which often rely heavily on grains, legumes, and soy - may include elevated triglycerides, insulin resistance, and fatty liver, particularly in genetically susceptible individuals (Rogers et al., 2022).

The Elderly

Aging is accompanied by reduced gastric acid production, impaired nutrient absorption, hormonal shifts, and muscle wasting - all of which make the elderly uniquely vulnerable to malnutrition. In this context, the deficiencies inherent to a vegan diet are not simply suboptimal, they are potentially catastrophic.

B12 absorption naturally declines with age due to atrophic gastritis and reduced intrinsic factor production, even among omnivores. For elderly vegans, who already lack dietary B12 sources, this compounds into a major risk factor for neurological decline, depression, and cognitive impairment (Lindenbaum et al., 1994).

Sarcopenia - age-related loss of muscle mass and strength - is accelerated by inadequate protein intake and poor amino acid quality. A study by Bauer et al. (2013) found that older adults require higher relative protein intakes than younger people to preserve muscle mass, ideally from high-leucine, animal-based sources. Vegan protein sources are less anabolic and often coupled with higher carbohydrate loads, increasing the risk of sarcopenic obesity and metabolic syndrome.

Calcium, vitamin D, and vitamin K2 deficiencies - common in vegan diets - contribute to bone demineralization and increased fracture risk in aging adults. A meta-analysis by Iguacel et al. (2020) confirmed significantly lower bone mineral density and higher fracture rates in vegans compared to omnivores, particularly in those over 60.

Additionally, the elderly may face difficulties chewing fibrous plant foods, further reducing nutrient intake. The high fibre load of vegan diets can also impair absorption of critical minerals like iron and zinc due to chelation by phytates.

Taken together, these factors make vegan diets particularly risky for aging populations, for whom nutritional absorption and efficiency become more, not less, important.

Real-World Compliance and Social Risk

Across all life stages, the practicality of strict vegan diets is limited by social, economic, and cultural realities. Supplementation regimens must be rigorously maintained, meal planning must be micronutrient-conscious, and access to fortified products must be consistent. Yet in the real world:

- Parents may not know how to supplement B12 or DHA for their children.
- Young adults may lack the financial or logistical means to buy algae oil, vegan protein powders, or synthetic K2.
- Elderly individuals may face decreased appetite, taste loss, or reduced digestive capacity, exacerbating deficiencies.

Additionally, food insecurity and cultural food norms in many parts of the world make veganism not only impractical, but dangerous when prescribed as a blanket solution. The global health community has repeatedly warned against such one-size-fits-all dietary ideologies (Allen et al., 2014).

Key Takeaway for Section 4

Across infancy, adulthood, and old age, vegan diets impose increasing biological strain and nutritional compromise. While certain individuals may appear to do well in isolated life stages—particularly young adults with access to supplements and high dietary literacy—this does not generalize across the population or lifespan. The exclusion of animal-sourced foods may be survivable for a time, but it is not sustainable, safe, or optimal for vulnerable populations whose biological needs are greatest and whose margin for error is smallest.

Section 5 - Supplementation and Fortification: A Red Flag

The claim that vegan and plant-exclusive diets are "suitable for all stages of life" often rests on a single premise: that with careful supplementation and fortification, all nutritional needs can be met. This argument is both the weakest link in the pro-vegan narrative and the most revealing. A diet that cannot provide the full range of essential nutrients without synthetic input is, by definition, not self-sufficient and not species appropriate.

Humans are not lab experiments - we did not evolve to thrive on pills, powders, and fortified breakfast cereals. The need for continuous external supplementation should serve as a clear warning sign - not as a badge of responsible planning.

Synthetic Nutrition: A Poor Substitute for Whole Foods

Many of the nutrients that are either absent or poorly bioavailable in vegan diets - such as vitamin B12, iron, DHA, vitamin D3, creatine, and vitamin K2 - can technically be supplemented. However, synthetic forms of nutrients are not metabolically equivalent to whole-food sources.

For example:

- **Cyanocobalamin**, a common form of supplemental B12, requires conversion in the liver to methylcobalamin or adenosylcobalamin, which not all individuals do efficiently - particularly those with MTHFR polymorphisms (Obeid and Herrmann, 2015).

- **Folic acid**, the synthetic version of folate used in many fortified vegan foods, can accumulate unmetabolized in the blood and has been linked to increased cancer risk in some studies (Smith et al., 2008).
- **Synthetic vitamin A (retinyl palmitate)** poses toxicity risks if overdosed, while beta-carotene conversion is inefficient in a large portion of the population (Tang et al., 2005).

Additionally, many supplements are poorly absorbed, especially in individuals with gut inflammation, low stomach acid, or poor fat digestion - all of which can be exacerbated by a high-fibre, grain-heavy vegan or plant-based diet.

Nutrient Synergy: The Missing Puzzle Piece

Even when individual nutrients are supplemented, they are not delivered in the natural matrix of co-factors, enzymes, and synergistic compounds found in whole animal foods.

Take red meat as an example: it contains heme iron, zinc, B12, vitamin A, creatine, and carnosine - all in highly bioavailable forms, in proper ratios, and with molecular interactions that enhance absorption. By contrast, isolated nutrients in a multivitamin do not interact with the body in the same way and may even compete for absorption (e.g., calcium inhibiting zinc uptake, iron competing with copper).

Whole foods are more than the sum of their parts - nutrients are presented within our natural foods to be consumed together, in complex, structured systems which work in harmony with our digestive and metabolic function. The reductionist approach to nutrition that underpins vegan supplementation fails to replicate this biological intelligence.

The Real-World Problem: Compliance and Access

Most nutrition studies that declare vegan diets “adequate with careful planning” assume:

- Daily supplementation with B12, DHA, iron, and vitamin D.
- Fortified consumption of plant milks and cereals.
- Knowledge of anti-nutrients and strategies to mitigate them (e.g., soaking legumes).
- Access to diverse, nutrient-fortified vegan products.

This framework assumes wealth, literacy, internet access, and obsessive diligence. In practice, adherence is wildly inconsistent. A 2017 study in Switzerland found that nearly 80% of vegans failed to meet even the minimum B12 intake from supplements or fortified foods (Schüpbach et al., 2017). Another study found that over 60% of vegan women had suboptimal DHA levels, despite knowing the importance of omega-3s (Welch et al., 2010).

In children and the elderly - populations that rely on caregivers - this level of vigilance is even less likely. The very idea of needing a spreadsheet to ensure basic survival contradicts any notion of “natural” human nutrition.

Philosophical Contradictions

There’s also a profound contradiction at the heart of the vegan health argument: the movement often promotes itself as “natural,” “clean,” and “ancestral” in spirit. Yet it openly admits that its diet requires synthetic fortification and pharmaceutical correction to prevent system failure.

In other words: the diet is incomplete by default. Without industrial interventions, nutrient collapse is inevitable. This is the opposite of a species-appropriate pattern. A truly biologically coherent diet is one that supports human life without modification, chemical crutches, or hyper-engineering.

The fact that veganism cannot exist without modern science and supplementation makes it evolutionarily absurd - our ancestors would not have survived, let alone thrived, on such a diet.

What About Omnivorous Diets?

Many comparative studies pit vegan diets against “omnivorous diets,” but this is misleading. Most omnivorous diets in the literature are not nutrient-rich, whole-food, biologically coherent ways of eating - they’re the Standard Western Diet, filled with refined grains, seed oils, sugar, and factory-farmed meat products.

The proper reference point is not omnivory in the generic sense, but a species-appropriate diet built on:

- Whole animal foods (meat, organs, seafood, eggs).
- Raw or fermented dairy (for those tolerant).
- Seasonal plant foods in a supplemental role.
- Minimal or no reliance on synthetic inputs.

The answer is not the mere inclusion of animal products - it’s about eating in alignment with our digestive physiology, evolutionary biology, and nutrient requirements. Compared to this framework, vegan diets are not just inadequate - they are a fragile, modern construction held together by synthetic patchwork.

The Danger of Overconfidence

Vegan advocates often cite professional associations (e.g., Academy of Nutrition and Dietetics) that declare vegan diets “appropriate for all stages of life” but these positions are based on ideologically influenced consensus, not robust science. The actual evidence shows widespread deficiency patterns, even in high-income countries, among long-term vegans and vegetarians (Rogers et al., 2022).

Moreover, reliance on supplements introduces new risks:

- **Overdosing** fat-soluble vitamins like A or D when guessing dosages.
- **Interactions** with medications or minerals.
- **Deceptive sense of security**, leading people to ignore signs of biological stress.

This is not nutrition - it's management of fragility.

Key Takeaway for Section 5

The need for continuous supplementation and food fortification is not a sign of progress - it is a red flag. A truly suitable human diet does not require correction, chemical patchwork, or industrial rescue. The vegan diet, by its very design, is a synthetic construct that fails the test of evolutionary biology, nutrient bioavailability, and real-world sustainability. A species-appropriate diet meets human nutritional needs organically, efficiently, and reliably - not by defaulting to pills and powders, but by aligning with the biological systems that shaped us.

Section 6 – Reframing the Debate Around the Ethical and Environmental Assumptions

One of the most compelling drivers behind the vegan movement is the ethical and environmental narrative: the belief that avoiding animal products is not only healthier, but morally superior and environmentally essential. Veganism is framed not simply as a dietary choice, but as a moral imperative - an act of compassion and sustainability. However, when these claims are critically examined through the lens of ecology, food systems science, and long-term human well-being, the argument becomes far less clear-cut.

This section challenges the dominant ethical and environmental assumptions used to promote vegan diets and explores whether these frameworks genuinely align with human and planetary health or whether they simply reflect a reductionist, industrial, and ideologically loaded worldview.

Ethical Reductionism and the Illusion of Harm-Free Eating

At the core of vegan ethics is the idea of reducing harm - minimizing animal suffering by abstaining from animal products, but this overlooks the reality that all food systems involve death. Modern plant agriculture, particularly monoculture grain and legume production, contributes to:

- The mass death of small mammals, birds, reptiles, and insects through mechanized harvesting and pesticide use.
- Habitat destruction on a continental scale.
- Soil erosion, aquifer depletion, and nitrogen runoff from synthetic fertilizers.

As biologist Dr. Mike Archer once put it, “There’s no such thing as a bloodless meal” (Archer, 2011). The moral calculus of plant-based eating ignores the ecological systems that must be destroyed to create fields of soy, wheat, and corn.

Furthermore, a diet that excludes animals but relies on global trade, industrial processing, synthetic inputs, and monoculture farming is not ethically clean - it is simply abstracted. The suffering is still there, it’s just outsourced to other species, ecosystems, and often, to the global South.

Regenerative Animal Agriculture and the Ethics of Stewardship

The binary moral framework - meat equals harm, plants equal peace - ignores the existence of regenerative and ethical animal agriculture. Properly managed livestock systems can:

- Sequester carbon in soil via rotational grazing.
- Restore biodiversity and soil microbial life.
- Improve water retention and reduce erosion.
- Produce nutrient-dense food from marginal land unsuitable for crops.

Systems like holistic planned grazing, silvopasture, and adaptive multi-paddock grazing model natural predator-prey dynamics. These systems do not just minimize harm - they restore ecosystems and rebuild fertility while feeding humans in alignment with their biological needs (Teague et al., 2016).

From an ethical standpoint, raising animals humanely in ecological systems - where their life and death are part of a functional whole - is fundamentally different from the industrial meat production that vegans rightly criticize. The problem is not *that* animals die; the problem is *how* they live. A death integrated into a cycle of life and regeneration is not unethical - it is ecological.

The Environmental Cost of Monocultures and Global Veganism

Environmental arguments for veganism often rest on data from life cycle assessments (LCAs) showing that beef and dairy have higher greenhouse gas emissions per kilogram of product. But these metrics often:

- Ignore land quality, assuming land used for grazing could grow crops (which is untrue in many regions).
- Treat all beef as equal, failing to distinguish between feedlot operations and regenerative grass-fed systems.
- Focus narrowly on emissions, ignoring soil health, biodiversity, water cycles, and nutrient density.

Moreover, if veganism were adopted globally, it would drive further expansion of high-yield monocultures: soy, wheat, corn, pulses. These systems are not environmentally benign. They are responsible for:

- 70% of global freshwater withdrawal (FAO, 2017).
- The collapse of topsoil on nearly one-third of arable land (Montgomery, 2007).
- The poisoning of aquatic ecosystems through fertilizer runoff.

Ironically, many vegan staples - soy milk, almond milk, pea protein isolate - require intensive processing, chemical inputs, and long-distance transport, making them far more industrial and carbon-intensive than locally sourced animal products.

Nutrient Density and Land Use Efficiency

Another common claim is that plant-based agriculture feeds more people per acre, but this assumes that all calories are equal, and ignores the concept of nutrient density per unit of land. Animal products deliver:

- B12, heme iron, DHA, retinol, complete proteins, and zinc.
- High bioavailability, without antinutrients.
- Energy-dense sustenance suitable for diverse life stages.

In many regions - mountains, grasslands, semi-arid zones - grazing animals are the only viable way to convert sunlight and cellulose into human food. These are lands that cannot support crops but can support nutrient cycling through herbivores.

A 2017 study by White and Hall found that a food system with modest animal inclusion produced more complete nutrition per capita than a vegan system, while using less arable land overall. Removing animals from agriculture may reduce calories but increases the risk of micronutrient inadequacy and reliance on supplements or synthetic inputs (White and Hall, 2017).

Cultural Imperialism and Global Food Sovereignty

Veganism is often promoted as a moral and environmental solution for the world but this position often reflects a Western, privileged, and urban worldview. In many indigenous and traditional societies, animal foods are sacred, seasonal, and essential. Attempting to “plant-based reform” these food cultures risks:

- Destroying local foodways and economies.

- Replacing nutrient-dense native foods with processed vegan exports.
- Undermining food sovereignty under the guise of ethics.

Ethical eating must account for context, not impose a single ideology across divergent ecological and cultural systems.

The Ethics of Human Health

There is also a moral cost to diets that produce systemic malnutrition, cognitive delays, fertility problems, and long-term deterioration, particularly among children and the elderly. A diet that leads to widespread B12, DHA, iron, and zinc deficiencies is not ethical - it is negligent!

Ethics must consider outcomes. The health of future generations, the developmental potential of infants, and the resilience of aging bodies matter. If a diet causes harm to the people who adopt it long-term, it cannot be considered a moral advance.

Key Takeaway for Section 6

The ethical and environmental claims used to promote veganism often rely on oversimplified narratives that collapse under scrutiny. True ethical eating is not about avoiding animal death at all costs - it’s about participating in ecological cycles in ways that honour the land, the animal, and the human body. Likewise, true environmental stewardship means working with nature, not against it, using regenerative systems that mimic natural processes rather than override them with monoculture and synthetics.

A species-appropriate diet, rooted in ancestral wisdom and ecological reality, is not only biologically superior - it is more ethical, more sustainable, and more honest than the industrially dependent illusion of “harm-free” eating.

Section 7: The Illusion of Consensus and the Role of Ideology

One of the most persistent myths surrounding veganism is the claim that it enjoys the full weight of scientific consensus. Advocates often cite statements from dietetic associations or endorsements by public health institutions as proof that vegan diets are not only safe but ideal. However, consensus in science is not always evidence of truth - it can also reflect cultural drift, institutional capture, and the influence of ideology.

This section explores how the apparent consensus around veganism has been shaped by selective science, professional politics, financial incentives, and a broader cultural shift toward nutritional reductionism and moral absolutism.

Institutional Endorsements: The Thin Ice Beneath

Major health organizations such as the Academy of Nutrition and Dietetics (AND) and British Dietetic Association (BDA) have issued position papers stating that well-planned vegan diets are appropriate for all life stages. These statements are often presented as scientific fact, but closer scrutiny reveals several problems:

- The AND position was originally authored with the involvement of vegan advocacy groups, including individuals affiliated with the Seventh-day Adventist Church, a denomination known for its theological vegetarianism (Rauma and Mykkänen, 2000).
- The BDA's statements rely heavily on studies comparing vegan diets to the Standard Western Diet, which is itself deeply unhealthy - this sets a low bar for comparison.
- Both institutions acknowledge the need for supplementation to avoid deficiency, undermining the claim that veganism is inherently adequate.

These are not definitive scientific endorsements; they are policy positions influenced by cultural, economic, and political factors.

Peer-Reviewed Doesn't Mean Unbiased

Many studies promoting vegan diets are funded or co-authored by advocates, NGOs, or food industry groups with a vested interest in plant-based marketing. This is not unique to veganism, but it does matter - particularly in nutrition science, where methodological weaknesses are endemic.

A landmark paper by John Ioannidis (2005) argued that most published research findings are false, especially in fields like epidemiology and nutrition, where confounding variables and biases are difficult to eliminate. Studies showing benefits of veganism often:

- Rely on food frequency questionnaires, which are notoriously inaccurate.
- Use observational designs, incapable of proving causation.
- Fail to account for healthy user bias (vegans are often more health-conscious in other lifestyle domains).
- Conflate vegan diets with whole-food, plant-rich diets, obscuring the role of processed vegan products.

Put simply: correlation is not causation, and much of the research that supports plant-based diets is correlation-heavy and context-poor.

Ideological Capture in Nutrition Science

The rise of veganism reflects not just new data, but a new narrative architecture. Nutritional discourse has become increasingly moralized, with food framed as either pure or sinful, clean or toxic, ethical or cruel. This binary framing leaves little room for biological nuance or ecological realism.

Veganism has become, for many, a form of identity - a moral and ideological commitment that resists contradictory evidence. Researchers and influencers within this framework may downplay or ignore findings that challenge the diet's safety, while amplifying studies that reinforce the belief system.

This selective pressure leads to publication bias, editorial bias, and media distortion. Papers that question vegan diets are less likely to be funded, published, or widely circulated. Meanwhile, glowing endorsements of plant-based eating - however flawed - are amplified through legacy media, Netflix documentaries, and social media echo chambers.

The Role of Religious and Cultural Influences

It is rarely acknowledged that much of modern vegan ideology has roots in religious dietary laws, particularly those of the Seventh-day Adventist Church. The Adventist influence on American dietetics is deep and well-documented. Many of the early leaders of the American Dietetic Association (now AND) were Adventists or influenced by Ellen G. White's teachings on abstaining from meat for spiritual purity (Banta, 2018).

This legacy continues today in institutions such as Loma Linda University, a hub of plant-based research funded in part by religious organizations. While religious freedom is essential, science shaped by religious conviction should be labelled as such, not passed off as objective public health advice.

The Media Machine and Public Perception

In the digital age, public opinion on nutrition is shaped less by peer-reviewed studies and more by social media, influencer marketing, and curated documentary narratives. Films like *The Game Changers* and *What the Health* reach millions, often presenting cherry-picked or outright misleading claims without scientific context.

These media properties create the illusion of overwhelming scientific agreement while ignoring counterevidence or portraying critics as fringe. The result is a manufactured consensus, not an organic one - driven by media virality, not methodological rigor.

This shapes how the public, especially younger audiences, interpret food and health. Veganism becomes not just a dietary choice, but a moral identity reinforced by algorithmic feedback loops, making it harder for individuals to question or step away without social cost.

Science, Not Scientism

True science is always open to revision - it thrives on scrutiny, contradiction, and falsifiability. Whereas, in the case of veganism, science is often replaced by scientism - a rigid, faith-like adherence to an idea dressed in the language of evidence.

This has dangerous consequences:

- It silences dissent within academic institutions.
- It marginalizes valid criticism as "anti-science."
- It allows flawed paradigms to ossify under the illusion of consensus.

Ironically, this mirrors the very thing that evidence-based nutrition was meant to replace - dogma...

Key Takeaway for Section 7

The widespread acceptance of veganism as a scientifically settled, ethically superior, and environmentally responsible dietary model is less the result of overwhelming evidence, and more the product of ideological momentum, institutional convenience, and cultural capture. The illusion of consensus masks serious unresolved questions about human biology, nutrient adequacy, and long-term health outcomes.

To move forward, we must reclaim nutritional science from ideology. That means applying scepticism not just to the meat industry or Big Food, but also to plant-based narratives, policy statements, and advocacy-driven research. Human biology doesn't care about trends - it responds to nutrient density, bioavailability, and evolutionary compatibility - not to belief systems.

Conclusion and Call for Rethinking

The mainstream promotion of vegan and strictly plant-based diets as universally optimal is a modern fiction - one that collapses under the weight of biological, clinical, and evolutionary evidence. While often well-intentioned and grounded in concerns about animal welfare and environmental degradation, these diets are fundamentally misaligned with the complex nutritional requirements of the human species. What they promise in moral clarity and simplicity, they sacrifice in biological realism and long-term sustainability.

This essay has shown that vegan diets - by design - lack or severely limit access to essential nutrients such as B12, heme iron, DHA, retinol, zinc, creatine, taurine, and K2. These are not fringe compounds but keystones of human development, cognition, immunity, fertility, and aging. Their absence can be life-limiting, especially in infants, children, and the elderly. While supplementation and fortification are often proposed as solutions, they merely mask the deeper issue: veganism is not a self-sustaining system of human nourishment. It is a diet that requires constant intervention, industrial scaffolding, and nutritional engineering to prevent breakdown.

Yet, despite these red flags, the narrative persists. Veganism is upheld by a powerful blend of cultural ideology, selective science, institutional bias, and moral absolutism. It is enforced through social pressure, institutional policy, and the seductive simplicity of binary thinking: animal foods = bad; plants = good. But human biology is not binary. It is complex, adaptive, and shaped by millions of years of dietary evolution

- evolution that has centred animal-sourced nutrition as essential, not optional.

It's important to be clear about what this critique is not. It is not a defence of factory farming, industrial meat, or ultra-processed omnivory. It is not an argument for dietary libertarianism or indulgence. It is also not an attack on ethical concerns about animal welfare or environmental responsibility. These concerns are real, and they demand thoughtful, evidence-based responses. However, eliminating animal foods is not the answer - in fact, it may be part of the problem.

What this essay does advocate is a return to a species-appropriate or biologically congruent diet - one that reflects our evolutionary design, supports long-term health, and honours both human physiology and ecological responsibility. This means:

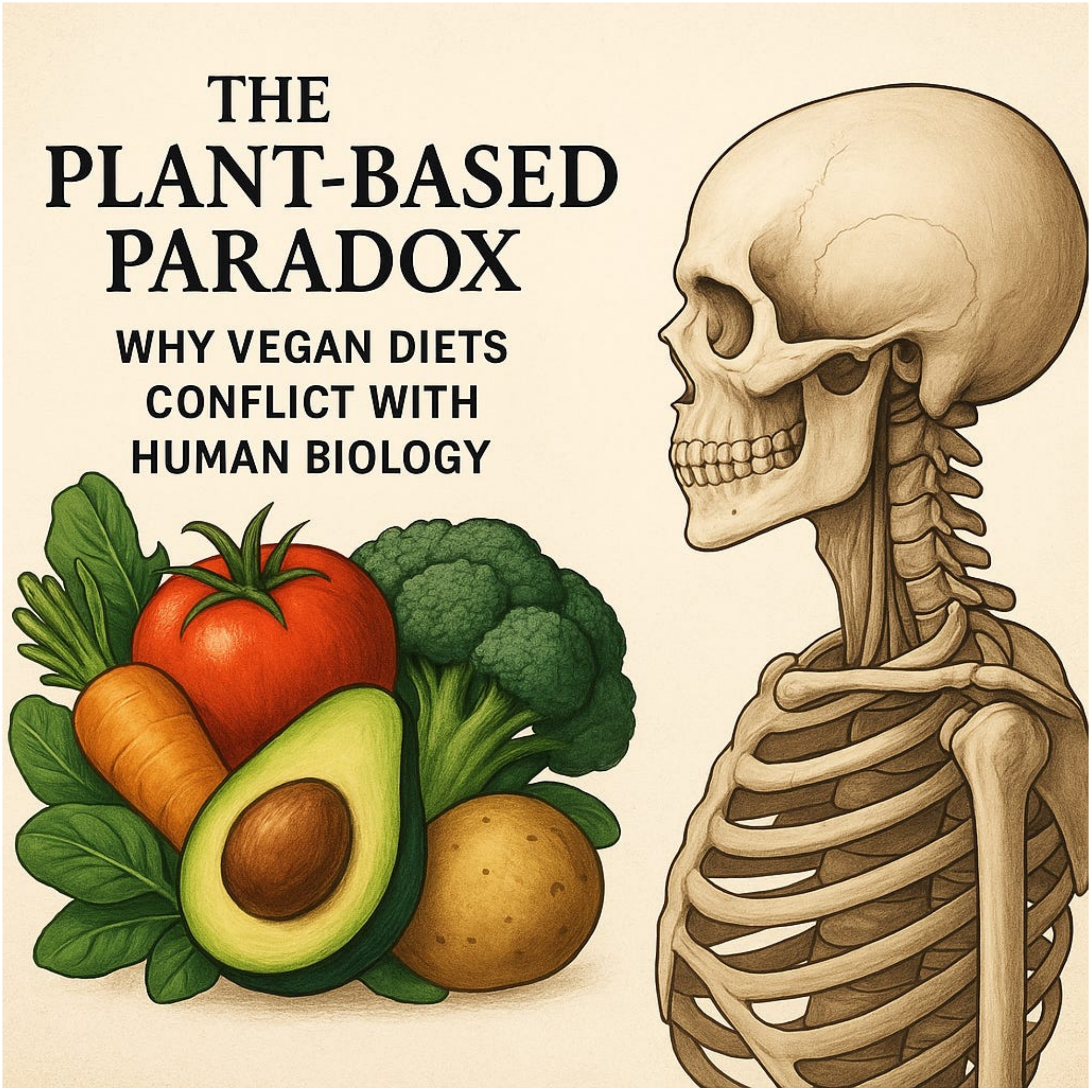
- Emphasizing nutrient-dense, whole animal foods - including meat, organs, eggs, seafood, and raw dairy.
- Incorporating plant foods seasonally or contextually, not as dietary foundations but as complements.
- Rejecting industrial food systems, both animal and plant-based, in favour of regenerative, ecosystem-aligned practices.
- Recognizing that health cannot be engineered through pills, powders, and synthetic fortification, but must be built through real food that nourishes from the ground up.

This approach is not nostalgic or dogmatic - it is pragmatic - it respects the body's hardwired requirements, the ecological logic of integrated food webs, and the ancestral patterns that have kept humans thriving for millennia. It acknowledges that ethics and sustainability must include nutritional sufficiency, developmental integrity, and intergenerational resilience.

We live in an era where more people are sick, infertile, and chronically undernourished than ever before - often in the midst of caloric abundance. Dietary ideology cannot fix this – only a return to biological truth can.

It’s time to stop treating food as a moral purity contest or a planetary PR strategy and start treating it as what it truly is: the foundational interface between biology, culture, and survival. Veganism, for all its aspirations, fails at that interface - whereas, biologically aligned, species-appropriate diet does not.

The path forward is not about returning to the past - it’s about reconnecting with what worked, updating it where necessary, and rejecting what clearly doesn’t. That begins by dropping the illusion of consensus, stepping outside ideological echo chambers, and reclaiming human nutrition as a field grounded in reality - not belief!



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