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Review Article

Western Diets Implications on Health, Including Its Influence on Metabolism and the Immunity

Hayam Aziz Mohammed[1], Rasha Ahmed Hashim[1*], K.M. Tawfiq[1]
[1]Chemistry Department, College of Education for Pure Science/Ibn Al-Haitham, University of Baghdad

***Corresponding Author:** Rasha Ahmed Hashim
Chemistry Department, College of Education for Pure Science/Ibn Al-Haitham, University of Baghdad

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Abstract: Processed and red The Western diet, a modern dietary pattern, typically consists of meat, sugar-filled beverages, candies, chocolates, fried foods, prefabricated meals, refined cereals, conventionally produced animal products, high-fat dairy products, and high-fructose items. The goal of this review is to outline how the Western pattern diet affects gut microbiota and mitochondrial fitness, as well as metabolism, inflammation, and antioxidant status. Cancer, mental health, and cardiovascular health; We offer a thorough analysis of how the westernized diet and related nutrients affect immune cell responses as well as the hygienic costs of the Western diet. A consensus critical evaluation utilizing primary sources, including scientific journals, was carried out in order to accomplish this purpose and secondary sources, such as websites, databases, and bibliographic indexes. The project was finished using the Web of Science, Sports Discuss, Embase, Science Direct, ResearchGate, and Scopus. MeSH-compliant terms like "metabolic health," "inflammation," and "Western diet" The terms "metabolism," "oxidative stress," "cancer," "heart disease," "metabolic fitness," and "mental health" were utilized Better knowledge of this dietary pattern, how it affects a person's health and metabolism, and how it affects national sanitary systems will be made possible by this knowledge. Lastly, useful applications based on this knowledge are presented.

Keywords: Health, Western Diet, Immune Cell, Metabolism, Foods.

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INTRODUCTION

Humans today, like all other animals, have a genetic profile that has been conditioned by their ancestors' environment [1]. About 10,000 years ago, agriculture and animal husbandry were introduced, which has resulted in significant dietary and lifestyle modifications for these "modern humans" [2]. The issue is that these changes happened too recently in terms of evolution for the human genome to adjust, which causes a conflict between our ancient biology and modern way of life. Prior to the development of agriculture and animal husbandry, hominins could only eat minimally processed wild plant and animal products [3]. But when plants and animals were domesticated, the nutrition Following the Industrial Revolution, the properties of these meals altered, and this transition was expedited by the development of technology. Novel foods that the human genome had limited evolutionary experience with were introduced as mainstays with the advent of agriculture. Additionally, methods for preparing food were created that permitted combinations of foods and substances that were unfamiliar to human evolution. It is important to take into account not only the foods and nutritional characteristics that pre-agricultural hominins would have consumed, as well as the kinds of foods and nutritional characteristics that weren't feasible for them to regularly consume prior to the advancement of agriculture, industry, and sophisticated technology. Furthermore, it is important to remember that 72.1% of the energy used every day by everyone Americans originates from refined sugars, refined vegetable oils, dairy products, cereals, and alcohol [4]. However, would have made up very little, if any, of the energy found in the average Pre-agricultural hominin [5]. Furthermore, processed foods including cookies, cakes, bakery goods, breakfast cereals, and snack foods predominate in a normal Western diet [6].

Impact, Expenses, and Health Consequences:

As a result, the food and nutritional model is altered, causing dissonance and exposing a number of epidemiological issues, such as the rise in numerous illnesses that plague society, such as heart disease and diabetes, and obesity [7, 8]. About 65% of American grownups who are 20 years of age or older are overweight or obese. As a result, obesity alone is thought to be the cause of 280,184 deaths annually. More than 64 million Americans suffer from cardiovascular diseases (CVD) [7], and they continue to be the country's biggest cause of mortality, making for 38.5% of all fatalities [4]. Additionally, 50 million Americans have high blood pressure and inadequate nutrition, which contributes to extended hospital stays and significantly raises public health expenses, In addition, 37 million people have high-risk total cholesterol levels of 240 mg/dL, and 11 million people have type 2 diabetes [9]. About 7.2% of postmenopausal women over 50 have osteoporosis, and 39.6% have osteopenia [10]. Furthermore, a 20% higher death rate in the year after the fracture has been linked to osteoporotic hip fractures. 25% of all deaths in the nation are caused by cancer, making it the second most common cause of death [11]. Therefore, in order to manage these issues, measures like promoting physical activity and a balanced diet are required. Public health campaigns and efforts can educate people about the need of a balanced diet and an active lifestyle [12, 13]. Additionally, lawmakers can implement laws pertaining to food labeling and taxing unhealthy meals in order to promote healthier options. Proactive action is necessary to address these problems and enhance the country's general health.

The Western Diet's Nutritious Features

In the world of nutrition, there has been a lot of debate about the Western diet. This contemporary dietary pattern is defined by low consumption of whole grains, nuts, fruits, and vegetables and high intake of processed and red foods, processed and processed meals, added sugars, as well as trans and saturated fats.

Numerous The Western diet has been linked to a number of chronic diseases, including as obesity, type 2 diabetes, cardiovascular disease, and many cancers. The Western diet's nutritional features, its impact on health, and potential solutions to improve eating patterns in Western cultures will all be covered in this essay [12].

The Western Diet Theory:

Fast food, Soft drinks and highly processed foods that contain extra sugars and saturated fats, and salt are examples of nutrient-poor, energy-dense foods that are a hallmark of the Western diet. On the other hand, traditional non-Western diets, like the Mediterranean diet, emphasize a lot includes fruits, vegetables, whole grains, legumes, and healthy fats like nuts and olive oil [14]. The use of refined and processed foods is among the primary characteristics of the Western diet meals that have been altered from their original condition, usually to extend their longevity or improve their flavor, are referred to as processed foods. Sugary drinks, packaged snacks, and quick food are a few examples [15]. White flour, white rice, and added sugars are examples of refined foods, which have had their inherent fiber and nutrients stripped away during processing. Another characteristic of the Western diet is the high intake of red and processed meats [16, 17]. While eating red meat has been connected to an increased risk of colon cancer and colorectal cancer, while processed meat has been linked to an increased risk of cardiovascular disease and type 2 diabetes [18]. The Western diet's excessive consumption of added sugars is another important feature. Added sugars are sugars and syrups, such as table sugar in baked products and high-fructose corn syrup in soft drinks. That are added to food while it is being processed. Excessive consumption of added sugars has been linked to an increased risk of obesity, type 2 diabetes, and cardiovascular disease [19]. Another feature of the Western diet is the excessive consumption of trans and saturated fats. Meat, butter, and cheese are examples of animal products that contain saturated fats., but processed foods like baked goods and fried, dishes contain trans fats. An elevated risk of cardiovascular disease has been associated with high consumption of trans and saturated fats [20]. We present official FAO data to shed light on which nations have been exposed to this diet concept. Using food balance sheets from the FAO, adjusted for consumer waste, each country's Western Dietary Similarity Index (WSI) is determined. The proportion of calories from fats, oils, animal products, and sugars to the total number of calories consumed by an individual can be computed using this information [21]. The US WSI in 2013 is equivalent to WSI = 70, which is a reasonable figure. This means that the worldwide steady-state WSI will match a dietary pattern where 70% of calories come from animal products, fats and oils, and sweeteners. The "Western diet countries" group consists of the following countries: Iceland (72), Switzerland (72), the United States (70), Australia (69), Sweden (67), Hungary (66), France (66), Austria (66), Germany (66), Denmark (66), New Zealand (64) the Czech Republic (65), the Netherlands (65), Spain (65), Belgium (65), and Finland (64).

The Western Diet's Impact on Metabolism:

The Western diet is frequently linked to cardiovascular disease, obesity, hyperlipidemia, diabetes, including insulin resistance and hyperinsulinemia [10]. Due to the high fat content of the Western diet and its effects on oxidative stress, recent research has shown how systemic inflammation may be made worse by diet [22].

It's interesting to observe this section discusses the potential effects of the Western diet on general health, taking into account both the amount and quality of macronutrients. Quantity-wise, Western diets have been connected to higher consumptions of animal fats and ultra-processed foods, including processed meats, candies, soft drinks, high-fat dairy products, as well as

processed corn and potato goods. Additionally, it has been noted that the Western diet has been connected to a decreased consumption of whole cereals, seeds, unprocessed fruits, vegetables, and seafood [12]. The Western diet has been linked to higher consumption of some nutrients of omega-6 and saturated polyunsaturated fatty acids and lower intakes of omega-3 polyunsaturated fatty acids, which may be detrimental to cardiovascular health [23]. But not all the evidence is in agreement, according to Nicholls *et al*., When compared to maize oil, in individuals including omega-3 in regular background regimens did not significantly alter the composite outcome of major adverse cardiovascular events in those with a high cardiovascular risk. These results run counter to the use of this formulation of omega-3 fatty acids. Could shield high-risk patients from serious cardiovascular side effects [24]. Furthermore, the most recent research suggested that a reduced consumption of fruits and vegetables may be linked to a lesser exposure to the fiber and antioxidants included in these foods, hence avoiding their positive effects on overall health, The protective effect of fruits and vegetables in managing general health is further supported by recent research suggesting that lower consumption of these items has been inversely linked to metabolic syndrome (25).(26)found that 28.7% of individuals in a research that combined Physical activity (PA) combined with a fruit and vegetable diet resulted in metabolic syndrome (MS), with prevalence rates of 32.9% for women and 24.7% for men. Those with appropriate Those with PA and sufficient FV intake had the lowest risk of MS. when compared to those with poor FV intake and PA [27]. Understanding the critical function of inflammation, potentially contributing to the development of metabolic syndrome, is essential to improving understanding of health effects of the Western diet [20]. Also referred to as syndrome X or insulin resistance syndrome, multiple sclerosis (MS) is characterized by a wide variety of phenotypic variations. A complicated illness linked to obesity, sedentary lifestyles, and the development of bad eating habits [26]. Accordingly, pro-inflammatory drugs raise oxidative stress, which leads to several metabolic syndrome-related diseases, including heart failure, hypertension, atherosclerosis, cardiomyopathy, obesity, dyslipidemia, and type 2 diabetes [28]. Therefore, earlier investigators suggested that the possibility of a link between elevated saturated fatty acid intake and postprandial inflammation could account for these findings. The period between 6 and 12 hours following food consumption, known as the postprandial state, is when there is an increase in fatty acids and carbs [29]. Furthermore, because earlier writers suggested that saturated fatty Acids have the ability to activate the immune system, and the postprandial state may be a source of pro-inflammatory chemicals [30]. According to these findings, saturated fatty acids might have molecular effects similar to those of lipopolysaccharide, a chemical that stimulates Toll-like receptor 4, which in turn causes the disruption of cellular metabolism and the release of pro-inflammatory cytokines. Additionally, since omega-3 fatty acids were linked to the reduction of inflammation after meals and Omega-6 fatty acids were linked to inflammatory processes, but polyunsaturated fatty acids may potentially have a major impact on metabolic processes, according to earlier research illnesses [31]. Both recent and earlier research, which demonstrated favorable correlations link postprandial state, Type 2 diabetes, atherosclerosis, and non-alcoholic fatty liver disease [28], also corroborated these finding. High lighting the significance of postprandial inflammation and how it relates to the various illnesses that make up metabolic syndrome. Accordingly, hesperidin, in model systems, naringin, narirutin, hesperetin, and naringenin exhibit anti-inflammatory qualities, while hesperidin causes inflammatory markers to decrease have been reported in human trials, according to an overview of how citrus fruits are used. In humans, orange juice decreased inflammation brought on by a diet heavy in fat and carbohydrates [25]. Previous studies on fiber discovered that individuals consuming a Western diet had a higher risk of developing obesogenic environments, which accelerated the development of insulin resistance and visceral obesity [32]. These results showed that Diets with higher fiber intake were associated with lower prevalences of metabolic syndrome, cardiovascular disease, and gastrointestinal disorders [21]. Because of its impact on the gastrointestinal system, fiber's beneficial role can be accounted for by its ability to control proliferative and inflammatory processes. Consequently, when fibers are ingested by an organism, the gut microbiota ferments them instead of digesting them in the gastrointestinal tract, producing short-chain fatty acids that are crucial anti-inflammatory compounds [33]. For example, Tremblay *et al*., determined that a sufficient consumption of After a 3-week randomized controlled study, dietary fiber ought to be a crucial part of diet-based weight-management strategies. Rigorous diet-exercise intervention [30]. These results imply that because fiber reduces oxidative stress, it could be a useful tool in the fight against metabolic disorders. Molecules known as antioxidant compounds have the ability to lessen oxidative stress and may therefore improve health. Polyphenols have been suggested as a possible method for controlling and preventing diabetes. Because of their demonstrated anti-oxidative and anti-inflammatory qualities [32]. Furthermore, prior research suggested that eating citrus-based items can provide antioxidant benefits because the citrus flavonoid narangin may lower inducible NO synthase activity and proinflammatory chemicals like TNF-a and cyclooxygenase- [21]. Citrus flavonoids appear to be helpful in treating metabolic syndrome and obesity in light of these findings [20]. Because they reduce inflammatory processes and play a significant antioxidant role. The most recent research on the effect of fatty acids on oxidative stress suggested that a larger ratio of omega-6 to omega-3 fatty acids was significantly associated with higher mortality from cardiovascular disease, cancer, and all causes of death [29]. The fact that

polyunsaturated fatty acids with omega-3 exhibit antioxidant properties and there is strong pro-inflammatory action in omega-6 fatty acids may help to explain these findings. Additionally, it has been widely suggested that the Mediterranean diet, as opposed to the Western diet, is made up of a number of antioxidant compounds, including alpha-linolenic acid, an omega-3-polyunsaturated fatty acid found in oleic acid, a monounsaturated fatty acid present in olive oil, and nuts and seafood such as sardines, salmon, or tuna [34]. Finally, it's been observed that this kind of diet also contains a sizable quantity of fiber and polyphenols, including flavonoids, which are antioxidant components found in fruits and vegetables and can improve health by lowering oxidative damage [35]. It is possible that the Western diet has a detrimental effect on metabolic syndrome in light of these results.

The Effects on Immunity of the Diet in the West:

The Western High intake of omega-6 and saturated fatty acids and low intake of omega-3 are characteristics of this diet fats, excessive use of salt, and excessive consumption of refined sugar [1]. Most people know that this kind of diet can harm the kidneys, heart, and waistlines if it is not moderated, but it is also becoming more and more obvious that the modern diet harms the immune system. Additionally, the modern lifestyle is characterized by higher levels of stress, increased exposure to pollutants, decreased exposure to microbes, and a numerous other remarkably thoroughly examined factors that probably play a role in immunological dysfunction [2]. Consequently, even though dietary influences on immunity shouldn't be considered separately, we concentrate on the body of research describing the ways in which the Western diet affects immunological function.

A- Total Amount of Nutrients Consumed:

Consuming enough Micronutrients and calories are necessary for optimal immunological function. As seen in famine-affected areas of the world, inadequate consumption of total calories and/or protein significantly impairs the immune system's capacity to react. For instance, inflammatory Since cytokines are proteins, other proteins in tissues and blood may be sacrificed in their production, when an infection occurs during hunger [3]. But the obesity pandemic makes it abundantly evident that there are too many nutrients in today's diet [1]. Although the West is not exempt from deficits in micronutrients, since the purpose of the purpose of this review is to explain how a Western diet affects immunonutrition. That is not commonly characterized by deficiencies in certain micronutrients, they include Consequently, it is deemed outside the focus. As a result, we advise readers who are interested in learning more about the immunological effects and molecular understandings of dietary vitamins and minerals to look for beautiful review publications [3-6]. Tumor necrosis factor and interleukin (IL-1) (TNF), and IL6 are among the inflammatory chemicals released by adipocytes [7]. It seems that these signals in animal models can serve as false alarms that, when present in sufficient quantities and over an extended period of time, make the system as a whole to become less sensitive; this is comparable to someone taking the battery out of a twitchy smoke detector that regularly sounds an alarm when there are no indications of a fire [7, 8]. When a real infection occurs, the reaction might be postponed as a result of the early warning system being turned off, similar to how turning off a smoke alarm increases the risk of a house catching fire [7]. Although human confirmation is inadequate; this idea is not exclusive to immunity; for instance abusers, of opioids downregulate innate opiate responses [10], and abusers of anabolic steroids downregulate their steroid responses [9]. People who are obese have less white blood cells, and the ones they do have, to fight infection are less able to phagocytose [11, 12]. Although the physiological responses in obese individuals are influenced by a complex interaction of hormonal, metabolic, and immunologic mechanisms, the resulting Immune system dysfunction raises the risk of surgical site infections, respiratory system infections, and gum infections following surgery [13–17]. Simply because the vaccination needle cannot reach some areas, even basic procedures like vaccinations may not be as effective. The arm's muscular tissue [18]. The elevated amounts of leptin in the blood may be one way that fat negatively impacts the immune system. Every mononuclear immune cell has a leptin receptor, and when this receptor is activated, TNF, Levels of The levels of IL-1 and IL-6 rise [19]. Leptin increases NK cells, decreases anti-inflammatory T-regulatory (Treg) cells, and activates the transcription factor STAT3 [20]. Generally speaking, Adiponectin and immunity have conflicting effects, and surprisingly, the ratio of the two can predict when diabetics will develop coronary artery disease [21]. It is hypothesized that obese people may eventually decrease the immunological activation associated with leptin [7], in a manner akin to the development of resistance to the appetite-suppressive effects of leptin [19]. Despite how fascinating the correlational data or in vitro effects of leptin could be the precise process via which an excessive amount of calories affect the immune system is still poorly understood and will be challenging to isolate from the underlying processes of the macronutrient sources of calories. Unfortunately, Currently, eating problems associated with picture fixation are also a result of contemporary eating patterns, and their effects on the immune system have received little attention. In contrast to obesity. Although the dietary shortages associated with the severity of eating disorders is not quite as high as those associated with famine in developing countries, they do seem to cause minor immunological abnormalities [22]. Both bulimia and anorexia may lower T-cell function and quantity, antibacterial complement proteins, neutrophil and monocyte counts, and effects related to any potential micronutrient shortage [23]. However, it's astonishing that most anorexic patients remain infection-free until the very end of their illness,

even though infections are a leading cause of death in this population; conjecture The explanation for this discovery suggests that either the blood provides a hostile environment for pathogen survival due to severe iron deficit and sequestration, or that Patients with anorexia usually have deficiencies in calories and carbs, but they may only have minor deficiencies in fat and protein [22, 23]. Additional research into the effects of eating disorders on the immune system are justified.

Sugars, Salt, and Fats in Western Diets:

Sugars:

According to in vitro data, processed, simple carbohydrates may also raise blood levels of inflammatory cytokines and decrease white blood cell phagocytosis [24, 25]. Interestingly, the authors credit their results to since the most direct studies on the impact of sugar on lymphocyte function are now forty years old, the proportional glycemic load of meals as opposed to the sugar content, hence more research using in vivo and/or contemporary methods is necessary. However, complex carbohydrate fiber—which is present in fruits and vegetables but not in starches—seems to lessen inflammation in both mice [33], and humans [26–32]. The effects of artificial sweeteners are less evident; controversial but scant data points to saccharin and Sucralose as a contributor to ulcerative colitis and Crohn's illness by interfering with the digestive proteases' homeostatic inactivation [34, 35]. However, there is no direct human research behind this information; it is based only on epidemiologic correlation and animal models. Additional research examining the Sweeteners' actions in cell culture point to benefits of blood anti-inflammatory [36]. There have been few investigations on more recent sweeteners, although stevioside's limited cell-culture data points to anti-inflammatory properties. characteristics while enhancing T and B cell phagocytosis and mitogen responses [31]. No direct research has been done on the possible immunological effects of mongroside V, the newest sweetener. Consequently, conclusive analysis of the immunological affects of sweeteners will necessitate more research.

Salt:

According to research on animals, eating a lot of salt may potentially aggravate autoimmune illnesses and enhance IL-17-mediated inflammation, however estimates on the potential effects on humans can only be considered preliminary [32]. However, there is a wealth of data regarding the impact of impact of dietary fat on immunity.

The Fatty Acids That Are Saturated

Fat can have negative effects, such as enhancing the prostaglandin system, which feeds into the arachadonic and prostaglandin E2 (PGE2) pathways. Among other things, PGE2 promotes inflammation by activating macrophages and increasing the production of IL-17 [23]. Additionally, the lipids in immune cell membranes are altered by dietary fats, impairing immunological activity [15]. However, the most worrisome feature of contemporary the capacity of dietary fat to directly initiate the inflammatory process.

Infection although intricate in its operation, when the immune system uses molecules called toll-like receptors (TLR) as one of its first defenses against.

When the immune system encounters a possible intruder, these sensors are designed to distinguish between fungi, viruses, and bacteria. The immune system can launch an attack right away if the body detects any of these species, while the adaptive immune system determines the particular pathogen that it is battling [26]. One of the TLRs is TLR4 weaponry that is intended to detect microorganisms. Regretfully, lipopolysaccharide is the portion of the bacteria that TLR4 binds. (LPS) mostly consists of saturated steric and palmitic fatty acids [17]. In other words, when excessive amounts, frequency, or homogeneity of a particular saturated fat are present as opposed to in a more biologically balanced dosage and balance, TLR4 may produce incorrect signaling. When saturated fat is viewed as a bacterial invasion, any resulting aberrant signaling could result in an unwarranted attack on it [9]. The ensuing intestinal inflammation may cause barriers to collapse, allowing toxic substances to escape the gut. into the bloodstream and exacerbate infection control by causing immunological dysfunction Human studies show that TLR4 is downregulated and that LPS translocation increases within hours of a saturated fat bolus, which is consistent with these in vitro and animal models [33]. Conversely, polymorphisms that impair TLR4 activity offer some protection against metabolic syndrome, dyslipidemia, and coronary artery disease [13]. Saturated fats have been linked to the pathophysiology of coronary artery disease and may affect the course of infections caused by both Grampositive and Gramnegative bacteria, including Staph. aureus and E. coli, by interacting with TLR4 and the bacterial receptor TLR2 share a coreceptor, CD14. [23]. A common confounding factor across.

Many clinical trials examining the immunological effects of fatty acids may be the removal of unwell participants and the ensuing absence of illness background. An intervention study examining a common exposure, such as Dietary N-6 that excludes persons with underlying inflammation may be omitting those who are biologically vulnerable, and as a result, their intervention may not have any impact even though retrospective studies have limitations of their own. Although clinical trials' lack of baseline inflammation may allay worries about omega-6's potential to cause Chronic inflammation: These trials do not address the possibility that n-6 intake may affect the risk for, management of, or inflammation during acute pathology because they take place without an infectious challenge or underlying inflammatory illnesses. Furthermore, n-6 clinical trials

have not yet measured inflammatory markers like IL-17 that are downstream of the enhanced PGE2 and the Th17 pathway) [33], or investigate the TLR4 axis directly, emphasizing TNF, C-reactive protein (CRP), or the more traditional Th1 markers of cardiovascular disease [34]. Additionally, small bowel inflammation might not increase the usual blood inflammatory markers that are assessed in these clinical trials, even if spreading disease [36]. Therefore, before any firm link clinical illness and the fascinating in vitro findings pathophysiology can be made, more research into the immunological effects of omega-6 will be required.

Gluten

Gluten components have been shown in recent animal and cell culture models to activate inflammation via TLR4 [30], although these results are far from definitive and need human linkage, they do raise interesting questions in light of the current trend toward a gluten-free diet. Even if this mechanism is eventually confirmed in humans, it differs from the primary Mechanism of celiac disease, which is that individuals with a very specific genetic predisposition have a gluten processing error that causes celiac sprue is a distinct and more severe kind of immunological activation. Proteins are frequently broken down by dendritic cells and other antigen-presenting cells (APC), and tissue trans-glutaminases change the gluten in food. The proteins on the MHC, or major histocompatibility complex are subsequently displayed to B-cells or T-cells for assessment; if they are thought to alien, they initiate immunological activation. In people with celiac disease, Because of a specific MHC receptor, either HLA-DQ2 or HLA-DQ8, processed gluten can function as a kind of super-antigen by binding the APC to the CD4+ T-cell without undergoing regular processing. By incorrectly stimulating the T-cell, this results in inflammation and discomfort [35]. However, HLA-DQ2 and HLA-DQ8 are present in over 40% of the population of Americans, yet only 1% of Americans are officially diagnosed with celiac disease [36]. There must therefore be additional, as-yet-undiscovered processes in addition to genetic and/or environmental risk factors.

Cancer Immune Nutrition

Despite the fact that up to one-third of malignancies in Western countries are believed to be caused by dietary variables [14], the intricacy of immuno-nutrition is clearly shown in research on the prevention of cancer. Thousands of bioactive chemicals may be present in a regular meal and it can be challenging to distinguish between their effects due to evidence that they may either inhibit or synergize with one another in terms of the development of neoplasms and potential confounding by additional environmental exposures such smoking and infections (hepatitis B and C for stomach H. pylori for stomach liver and cervical human papillomavirus Chronic inflammation is generally linked to a higher risk of cancer [15]. It is unclear if this is because of direct cellular damage, the previously mentioned downregulation of immunological reactivity, or a combination of the two. High consumption of alcohol, tobacco, and hot foods and beverages has been linked to both esophageal and oral malignancies [9]. The risk of colon cancer appears to be exacerbated by consuming large amounts of fat, salt-preserved meat, and red meat, while the evidence is not quite clear Drinking too much alcohol raises the risk of breast cancer and is linked to liver cancer brought on by cirrhosis [16]. Evidence of pancreatic risk factors related to diet Although they have been well studied, the kidney, prostate, and lung are more contentious While blocking the regular apoptotic pathways, palmitic acid may raise the rates of DNA mutations and intensify iron-mediated toxicities Consumption of food of omega-9 oleic acid, Steric and saturated palmitic fatty acids could be different risk factors for colon cancer development cancer [14]. It was previously believed that simple carbohydrates increased the risk of cancer through a number of thoroughly examined in vitro pathways [15], but recent clinical research indicates that sugar consumption is not linked to an increased risk of cancer and that the initial findings are more likely to be connected to glycemic load or total calorie intake [16]. Nonetheless, there is strong evidence that obesity raises the risk of esophageal, colon, uterine, and breast cancers kidney as well [17].

CONCLUSIONS

In addition to discussing the hygienic costs of the Western diet, this review sought to describe how it affects gut microbiota and mitochondrial fitness, cardiovascular health, cancer, and metabolism, inflammation, and antioxidant status. This review's primary findings are that complex carbohydrates, fiber, fruits, and veggies can help prevent cancer and metabolic illnesses, as well as the development of cancer in connection with dietary consumption often found in the Western diet. Most concerning of all, our unhealthy eating habits are ingrained in our gut microbiota and DNA structure, thus these detrimental Our children inherit immunological changes throughout the most crucial period of their development. Consequently, at the very least, the dietary impacts on immunological health ought to be given the same consideration as those on cardiovascular health because of their wide range of impact, significant financial implications, and potential for transgenerational inheritance.

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