

Effects of Modern Lifestyles and Toxins
on Human Health

By

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A handwritten signature in black ink, reading "Dr. Amy Schlieve". The signature is written in a cursive style and is positioned above a horizontal line.

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ABSTRACT

The purpose of this study was to research some of the effects of modern lifestyles and toxins on human health. Specifically, to recommend wholesome lifestyles that inherently includes nutritious diets and minimal exposure to toxins. This type of lifestyle will help develop and maintain strong, healthy, minds, bodies and immune systems. This paper addresses the decline of some aspects of general health in North America due to poor lifestyles and diets. It presents some of the proposed causes and resultant diseases associated with this decline and it endeavors to give the reader a much broader perspective on human health and its holistic nature. Also included in this paper are recommendations for further research on the topics of holistic health, oxidative stress, the effects of prions and other toxins on the human body and the exciting new field of Glycoscience. Finally, this study offers a valid, perhaps even life saving recommendation to adopt a holistic lifestyle that will help prevent disease and improve health. Specifically it recommends a lifestyle that includes a whole-foods (plant-based) organic diet that maximizes pure water and plant fiber and minimizes excess fat, sugar, protein and toxins.

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Chapter I: Introduction

This chapter will begin with an introduction on some of the effects of modern lifestyles on human health and then continue with three discussions on the following interrelated aspects of holistic human health: (a) Some of the problems that a twenty-first century lifestyle imposes on humans, (b) The nature and cause of prions, a relatively new threat to humanity; (c) Proposed solutions to some of the problems that a twenty-first century lifestyle causes with a holistic diet and minimal exposure to toxins being an integral part of the solution.

From the dawn of human creation, loving and caring parents have sought to give their children a good life, a life that is equal to or even better than their own. This life should include, among other important things, wholesome nutritious food and a toxin free environment (Nedley, 1999). If this is true, then why are so many families, in this modern, scientific age, falling short of this ideal (Campbell, 2005)? Why are we, in many cases, voluntarily exposing ourselves and our children to deadly environmental toxins, and at the same time providing substandard, unhealthy meals for our families (Nugent, 2004)? Why are we putting food on our tables that is depleted in nutrients, and contains too much fat, sugar and toxins, and too little natural fiber (Campbell, 2005)? Why are we robbing ourselves and our families of the wholesome nutrition we desperately need to build strong minds, bodies, and immune systems; all of which are vital for proper development and for counteracting the many physical and psychological toxins we are exposed to in our modern, industrial world (Nugent, 2004)? Finally, why are we as parents, and an educated society, role modeling these poor lifestyle choices to our children, who are the very future of our race and planet (Campbell, 2005)? Current

statistics show that many Americans will suffer and most will die from the results of a poor lifestyle, or as Dr. Campbell states, from “diseases of affluence” (Campbell, 2005, p. 105). “During the past two to three decades we have acquired substantial evidence that most chronic diseases in America can be at least partially attributed to bad nutrition” (Campbell, 2005, p. 305). “As the billions of people in the developing world are accumulating more wealth and adopting the Western diet and lifestyle, the problems created by nutritional excess are becoming exponentially more urgent with each passing year” (Campbell 2005, p. 348).

Many people erroneously believe that inherited traits (defective genes) ultimately determine longevity and the quality of life. However, the real truth for most people is that; (1) the things we put into our bodies and (2) the things we do with our bodies largely determines our lifespan and state of health. The grand total of all the choices we make in these two areas is known as our lifestyle (Nedley, 1999).

Problems

The progress and accomplishments of our modern medical technology is truly amazing and commendable. However, in spite of all that modern man has learned and perfected in our twenty-first century technology, it is obvious that we have fallen short in both knowledge and practice of the medical arts. This is evident because there are many unconquered and devastating, fatal diseases that are on the increase and may indeed become health epidemics if not conquered in the near future (Campbell 2005). “The medical status quo relies heavily on medication and surgery, at the exclusion of nutrition and lifestyle. Doctors have virtually no training in nutrition and how it relates to health” (Campbell, 2005, p. 327). In 1985, the United States National Research Council

determined that the quantity and quality of nutrition education in United States medical schools is largely inadequate to meet the present and future demands of the medical profession (Committee on Nutrition in Medical Education, 1985). The philosophy and scope of our Allopathic system, as amazing as it is, tends to be incomplete and short term. It does not adequately address the human body as a holistic system, with its many interconnected facets (Campbell, 2005). It is deficient in identifying and recommending what is needed to achieve complete optimum human health over the long term. Typically, this short-term, reactive philosophy and resulting medical system, does very little to find the real root causes of many chronic diseases to eliminate and prevent them in the future (Campbell, 2005). This is especially true for the economically poor in large cities and ultra rural areas (Kozol, 2000).

Many chronic, lethal diseases are actually increasing and may reach epidemic proportions if not properly addressed very soon (Nugent, 2004). The research provided by such experts as Dr. T. Colin Campbell, Dr. Dean Ornish, Caldwell B. Esselstyn, Jr. MD, and Dr. Steve Nugent exposes the overall harmful and even lethal effects of our modern lifestyles on family health and our overall quality of life. Collectively, their research proclaims that there is something seriously wrong with our modern way of life (Campbell, 2005). Dr. Steve Nugent summarizes the situation this way: our environments are polluted, our lifestyles are unhealthy, and our food is substandard and even toxic in some instances. The results of these poor choices are making our children, and us sick and diseased (Nugent, 2004).

Many Americans are grossly ignorant of imminent health dangers and the real causes of the increasing rates of some very serious chronic diseases in our modern society

(Campbell, 2005). We are not only ignorant of the magnitude of toxic pollution, which is destroying our planet, but also of the extent of damage that our modern industrial lifestyles cause our own minds and bodies (Nugent, 2004). The damage is caused by an inadequate and poisonous diet, toxic environmental pollution, multiple stresses, lack of exercise and an insufficient intake of water, fiber and clean air (Nedley, 1999). The result is that many people in America and the Western world are out of shape, overweight, excessively stressed, nutrient starved, and loaded with toxins. This condition can and usually does result in a myriad of adverse symptoms and diseases (Campbell, 2005).

According to an article in the Journal of American Medical Association;

Modifiable behavioral risk factors are leading causes of mortality in the United States and quantifying these will provide insight into the effects of recent trends and the implications of missed prevention opportunities. Analyses show that smoking remains the leading cause of mortality, however, poor diet and physical inactivity may soon overtake tobacco as the leading cause of death. These findings, along with escalating health care costs and aging population, argue persuasively, that the need to establish a more preventive orientation in the United States health care and public health systems has become more urgent. (Mokdad, Marks, Stroup, & Gerberding, 2004).

Finally, here is a shocking summary of 21st Century American health: Half of all Americans will develop heart disease, one third of all Americans will get cancer, 50,000,000 people already have some form of autoimmune disease, and all degenerative diseases are on the increase (Nugent, 2004).

Prions

Another, relatively new problem discussed in this paper is the subject of Prions, which is a serious threat to human health. Prions are infectious proteins found in animals that are believed to cause bovine spongiform encephalopathy (BSE or mad cow disease), and other transmissible spongiform encephalopathy's, when ingested by other animals or humans (Nedley, 1999). Prion, pronounced "pree-on", is short for proteinaceous infectious particle. It is a unique type of infectious agent, which is itself a protein. Prions are actually a form of protein that is abnormally shaped and act as a host protein that is able to convert normal protein molecules into abnormal structure or shapes. It is not known yet exactly how this is accomplished but it is now commonly accepted that prions do cause transmissible spongiform encephalopathies (TSEs). These include scrapie (a disease of sheep), Creutzfeldt-Jakob disease (CJD), and bovine spongiform encephalopathy (BSE or mad cow disease). Important points to remember about prion diseases are that there is no known cure and they are brutal diseases that cause a great deal of suffering. In addition, prions are not living organisms like a virus or bacteria, but a protein and as such are extremely resistant to sterilization and eradication (Nedley, 1999). There have been documented cases of people contracting prion diseases from contaminated medical instruments even after those instruments were subjected to normal sterilization procedures (Liberski, 1990). It is very possible that prions can also be found in animal products other than meat such as milk, butter and cheese. The incubation period for prion diseases is very long, usually in years, for both animals and humans (perhaps up to 30 years for humans), so they may not produce symptoms initially, thereby giving the dangerous illusion of being disease free. Despite our government's attempts to persuade

us otherwise, there is now overwhelming scientific evidence that eating animal products is very dangerous because of all the toxins, contaminants and diseases they contain (Nedley, 1999).

Our global environment is very complex and contains many different potentially toxic chemical substances (Rhodes, 2000). In fact, “there are over 75,000 synthetic chemicals that have been added to our environment since 1930 and only about 7% have been tested for safety in adults and 3% in children” (Nugent, 2004, p. 36). These xenobiotic agents can and do invade living organisms via environmental pollutants, diet, and pharmaceuticals. Specifically, these toxins can be found in the form of airborne particles such as asbestos, coal dust, workplace dusts, cigarette smoke, diesel fumes, ethanol fumes, thiols, organic solvents, refrigerants and others. It is becoming apparent that free radicals in living organisms are an integral part of these toxic processes (Rhodes, 2000). A British Medical Journal reported that an estimated 75 percent of most cancers may be caused by lifestyle and environmental factors. This includes exposure to modern industrial chemicals. In addition, a report, by the Columbia University School of Public Health, indicated that 95 percent of cancer is caused by diet and environmental toxicity. There are more than 10,000 chemicals such as solvents, emulsifiers and preservatives used in food processing and over three thousand chemicals are added directly to our food supply. In addition, one thousand new chemicals are introduced into our ecosystem each year. (Mercola, 2006).

The United States Center for Disease Control and Prevention conducted a first-time study in the year 2000 on people around the world for 27 toxins out of the potential 75,000+. The study found that 100% of the people tested had some amount of all 27

toxins. Finally, Nugent states that pollution is worldwide and no one can avoid exposure to synthetic chemicals and toxins altogether, regardless of where (they) are in the world (Nugent, 2004).

Solutions

In light of the preceding statements, we as a nation and society need to learn the truth about environmental pollution and our human health. There is still time to take charge of the situation and put an end to this serious condition but we must not delay because time is of the essence. Every species on this planet is in grave danger (Nugent, 2004). “Greed, selfishness, sloth, apathy and ignorance have created an environment that is now manifesting itself in disease, suffering and death in our populations” (Nugent, 2004, p. i). Together, we can stop this run-away train and prevent the destruction of our race and our planet if we change our attitudes and adopt the right policies and take the right actions. However, we need to hurry because the window of opportunity is closing fast (Nugent, 2004).

The first part of a solution is to understand the problem or problems, starting with the problem closest to us: our own health and individual lifestyle. “The American people need to know what we have uncovered in our research. People need to know why we are unnecessarily sick, why too many of us die early despite the billions spent on research” (Campbell, 2005, p. 19). There are answers to these questions, and the answers are positive. “Even though we cannot immediately eliminate global pollution or change our genetics we can change our lifestyles. Those lifestyle choices can prevent or forestall the development of diseases for which we are genetically predisposed” (Nedley, 1999).

Therefore, the first course of action should be to naturalize our lifestyles and diets and minimize our exposure to toxins as much as possible within our modern environment. We must do this in order to regain our health, vitality and happiness (Nedley, 2004). To do this effectively and safely however, we need a new framework of understanding; a framework that will give us a correct philosophy of health, disease and nutrition. This new framework must be up-to-date and based on valid medical science and unbiased data. We need an honest framework that seeks to eliminate the multitude of food and drug industry propaganda and confusion; a framework that will actually specify appropriate, healthy lifestyles. Finally, we need a framework that will seek to identify, prevent, and treat the real causes of disease regardless of the potential loss of sales and tax revenues (Campbell, 2005).

A good starting point for this new framework would be a reality check on our current situation. If we look carefully and realistically at our present-day world, we will see an ecosystem that is becoming increasingly polluted and unstable, subsequently causing a myriad of human ailments (Nugent, 2004). We will also see an emerging pattern of poor health in the Western world, especially America (Campbell, 2005). For example, Americans spend far more, per capita, for health care than any other country in the world, and yet 50% of all Americans still have to use prescription drugs. Eighty-two percent (82%) of all Americans have at least one risk factor for heart disease, while 65% are overweight and 31% are actually obese. One third of our youth (ages 6 to 19) are overweight, which at their young age puts them at serious risk for diabetes, cancer and cardiovascular diseases. Between 1992 and 2002, the rate of doctor visits for people 45 and older increased by 14%; from 407.3 to 465.8 visits per 100 persons (Cherry, &

Woodwell, 2002). Currently 23 million Americans have heart disease and at least 16 million have diabetes (Campbell, 2005).

In the past 40 years, medical costs in the United States have outpaced inflation so much, that we now spend 1 out of every 7 dollars the nation produces (Gross Domestic Product) on health care expenditures. Even after taking into account the inflation factor this still amounts to a 300% increase in health care expenditures in less than 40 years (Campbell, 2005). In 1997, the United States spent one trillion dollars on health care. The Health Care Financing Administration predicts that by the year 2030 the cost of our spiraling health care expenditures will be 16 trillion dollars (Health Insurance Association of America, no date).

Obesity is defined as a person carrying more than 133% of a healthy weight. The risks of obesity are often presented as minimal in our society; however, obesity is very dangerous because it is frequently a precursor to many maladies such as arthritis, diabetes, high blood pressure, sleep apnea, muscular/skeletal problems, a host of deadly cardiovascular diseases and many types of cancer (Campbell, 2005)

Diabetes is the fifth deadliest disease in the United States and is directly linked to obesity. Two-thirds of all Americans are overweight and one third is obese (Campbell, 2005). This year, more than 224,000 Americans will die from diabetes or its related complications. The total annual economic cost of diabetes in 2002 was estimated to be \$132 billion, or one out of every 10 health care dollars spent in the United States. Overall, the risk of death among people with diabetes is about twice (200%) that of people without diabetes. The physical results of diabetes are often severely debilitating and irreversible (American Diabetes Association Fact Sheet, no date).

Americans are fast becoming the heaviest people on Earth. Overweight Americans now significantly outnumber those who maintain a healthy weight (Campbell, 2005). According to an editorial in the New England Journal of Medicine childhood obesity and diabetes has reached epidemic proportions (Rocchini, 2002). During the past 30 years the number of overweight children in the United States has more than doubled. In 1983, 18.6% of preschool children in the United States were classified as overweight, and 8.5 % were defined as obese. By the year 2000, 22.0% of pre-school children were overweight and 10.0% were obese. Similar increases in the prevalence of obesity have been observed around the world. Childhood obesity is the most serious and prevalent nutritional malady in the United States. Obesity has a substantial effect on the risk of cardiovascular disease. Childhood obesity is directly linked to abnormal blood pressure, unhealthy lipid, lipoprotein, and insulin levels in adults, as well as to the risk of both coronary artery disease and diabetes. It is also related to a strong history in the immediate family of coronary heart disease, myocardial infarction, angina pectoris, and high blood pressure. Obese children also have a higher incidence of insulin resistance and type 2 diabetes. As the prevalence of childhood obesity increased between 1982 and 1994, the incidence of type 2 diabetes increased by nearly a factor of 10. The authors of that report also stated that in 1996, one third of all new cases of diabetes in children 10 to 19 years of age could be classified as type 2 (Rocchini, 2002).

There is strong evidence that diabetes is linked directly to diet and specifically to dairy products (Campbell, 2005). Cow's milk is believed to be one of the causes of type 1 diabetes in children. The theory is that in certain babies, the milk protein is not fully digested in the small intestine and some fragments enter the blood stream. A virus in the

digestive system may trigger this incomplete digestive condition. Initially the immune system recognizes these undigested fragments as foreign material and destroys them. However, these fragments appear to the immune system to be very similar to the pancreatic cells that produce insulin. After time, the immune system becomes confused, loses its ability to distinguish between the two, and simply destroys both. This results in the devastating situation of the child being a type 1 diabetic (Campbell, 2005).

Cancer is a dreaded and terrible disease and has multiple suspected causes. It will be discussed further in chapter two of this paper. It is the second leading cause of death in the United States with well over a half-million victims annually. However, as scary as cancer is, it is only part of an even larger picture of suffering, disease and death in America (Campbell, 2005). Cardiovascular disease still remains the number one killer in the United States and will be discussed further in this paper (Campbell, 2005).

In spite of all of its wealth and power, the United States is a sick nation that is facing an imminent medical catastrophe if it does not start to make better lifestyle choices (Nugent, 2004). A prime example of these poor choices on a societal level is our schools and our giant fast food industry. By their actions, these two dominant institutions in our Western culture are actually role-modeling unhealthy lifestyles to our youth (Campbell, 2005) Although, to their credit, there have been some schools that have moved toward healthier snacks, many schools in the United States still contain vending machines filled with snacks that are, for the most part, unhealthy and fattening (Hellmich, 2004). In addition, fast food restaurants continue to pump out nutritionally depleted, high fat, low fiber, meals by the billions to adults and children (Campbell, 2005). These “fast food” meals are not only nutrient incomplete but often contain unhealthy substances such as

chemicals in the form of animal pharmaceuticals, food preservatives, added sugar and fat (Campbell, 2005). To make matters worse, vending machines and fast food chains are not the only ones selling us nutritionally depleted and potentially toxic food. Refined and prepackaged food is being promoted across the entire food industry, including our school breakfast lunch programs. There are, however, some hopeful bright spots in the types of foods being offered to students in our schools. Some schools are banning junk food vending machines and adopting more nutrient complete healthy food curriculums and lunch programs. One such nutrition program was designed by one of Dr. Campbell's graduate students, Antonia Demas (now Dr. Antonia Demas) Her very successful nutrition /health program was taught as a curriculum and then integrated into the school lunches of elementary students. The students readily accepted the delightful learning style of her health curriculum and were excited to eat the healthy, tasty, plant-based foods. Her program won national awards for excellence in "nutrition education" and "most creative implementation of dietary guidelines." This program has proven to be of interest to more than 300 school nutrition and behavioral rehabilitation programs around the United States. Dr. Demas went on to establish a nonprofit foundation called Food Studies Institute in Trumansburg, New York and has written a curriculum entitled Food is Elementary.

Unhealthy, refined and processed foods have been accepted, and even welcomed by the masses because of the fast lifestyle that our modern society is entrenched in (Campbell, 2005). People want their food refined and prepackaged to save time, and that results in nutrient depletion and chemical additives to prevent spoilage (Nugent, 2004). In addition, they are packaging these processed foods in plastics and metals, which can

leach into our food and into our bodies. There is now evidence that leached substances from plastics and metals can cause serious health problems in humans and especially children because they are still developing and have a smaller body mass to process the toxins (Campbell, 2005).

The good news to the all of the preceding is that the debilitating effects of a poor diet can be checked or even reversed. Overwhelming data from *The China Study* reveals that the risk of contracting deadly diseases can be minimized simply by eating the right foods (Campbell, 2005). Other researchers such as Dr. Dean Ornish and Caldwell Esselstyn for example, have proven with images of human arteries, that a whole foods plant-based diet actually reverses heart disease (Ornish, Brown, Scherwitz et al, 1990; Esselstyn, Ellis, Mendenorp et al, 1995). (Cited in Campbell 2005).

For most people it is possible to improve their lifestyles and quality of life by the following steps: 1) work through the current political system to reduce environmental pollution, 2) take adequate measures to reduce personal exposure to toxins in homes and work environments, 3) adopt holistic lifestyles which include a wholesome diet and the elimination of unhealthy practices such as smoking and oversteering, 4) ingest high quality food supplements and antioxidants to counteract environmental toxins and oxidative stress (Nugent, 2004). However, if we choose not to change our lifestyles and correct the impending health disaster, we will allow our children and ourselves to become sick and diseased, and eventually jeopardize the very future of our human race and planet (Nugent, 2004)

Summary

Many people in America and the Western world are unhealthy and becoming increasingly diseased. Our medical system has not been successful over the long term in identifying the root causes of most chronic diseases in order to conquer and prevent them (Campbell, 2005). What is really happening in the United States and many other Western countries is that we are slowly killing ourselves and our children with an improper diet, toxic environmental pollution, multiple physical and emotional stresses, a lack of exercise and an insufficient intake of water, fiber and fresh air (Nedley, 1999). Is it not time that the richest, most powerful nation in the world put an end to this serious condition? Is it not time we stop destroying ourselves and our planet for the sake of convenience and business profits? We need to go back to a more natural, wholesome lifestyle and diet to regain our health, vitality and happiness. We need to learn the truth about our lifestyles and health so that we can make much better choices in the future and begin the healing process (Campbell, 2005).

Statement of the Problem

The objective of this study is to research the question of the effects of modern lifestyles and toxins on human health. Even though there is a wealth of information and so-called expert opinions about health and nutrition available to the public, much of it is contradictory and confusing (Campbell, 2005). As a result, relatively few people in the public sector really understand exactly what they need to do to maintain or improve their children's health as well as their own (Campbell, 2005). This is not because there is a lack of good research. Medical science now knows an enormous amount about the direct connection between lifestyles, nutrition, toxins, and health. However, the real science and

knowledge of human health is often buried under a tangled mess of irrelevant and even harmful information such as food and drug industry propaganda, fad diets, junk science, and outdated information on health and nutrition (Campbell, 2005).

Purpose of the Study

The purpose of this study is to establish a new framework to understand the holistic nature of health and the direct connection between modern lifestyles, toxins and health. Good health is the most valuable asset that humans can possess and we must strive to maximize it, and protect it, through public education and personal practice.

Assumptions and Limitations

The major assumption in this research project is that its prominent references will be unbiased and based on current scientific research. Limitations will be that some of the references that will be used for this project are based on new and innovative research and will not have prolonged historical corroboration behind them. In addition, the topics of human health, environmental pollution and toxicology are huge subjects that this paper only begins to address. It is recommended that the reader do much more research on these subjects in an effort to achieve optimum personal and family health and help reduce global pollution.

Definition of Terms

There are several terms that need to be defined for clarity of understanding. These are:

Depleted Soil. Soil that does not provide the mineral elements necessary to produce plants that contain the 42+ mineral elements that humans need for optimal health (Nugent, 2004).

Free Radicals. In chemistry, radicals (often referred to as free radicals) are atomic or molecular species with unpaired electrons or an otherwise open shell configuration. These unpaired electrons are usually highly reactive, so radicals are likely to take part in chemical reactions. However, because of their reactivity, these same free radicals can participate in unwanted side reactions resulting in cell damage (Wikipedia contributors, 2006).

Glycobiology. Glycobiology (or Glycomics). An area of biology that deals with the structure and function of oligosaccharides (chains of sugars{monosaccharides}). The term glycomics is taken from the chemical prefix for sweetness or a sugar, "glyco-", and was created to follow the naming order established by genomics, which is the study of genes, and proteomics, which is the study of proteins (Wikipedia contributors, 2005). These sugars (monosaccharides) can technically be called carbohydrates but should not be confused with sweet tasting table sugar which is a disaccharide. Out of the 200 monosaccharides found in nature, the latest research indicates that human beings need eight of them for optimal health and a ninth for proper delivery of the eight. Five of them are non-acetyl saccharides and the other four are precursors to the non-acetyl saccharides. These essential monosaccharides are also referred to as glyconutrients (Dubouch, 2003).

Glycoprotein. Glycoproteins are bonded structures that are composed of proteins bonded to sugars by a covalent bond. The majority of proteins in the human body are glycoproteins. Each glycoprotein contains at least one of the eight essential sugars, which are: galactose, glucose, mannose, N-acetylneuraminic acid (NANA or sialic acid), fucose, N-acetylgalactosamine, N-acetylglucosamine, and xylose. These essential sugars are referred to as glyconutrients (Dubouch, 2003).

Holistic. Holistic is defined as an integral relationship between individual parts that comprise a whole unit. A holistic approach to healing recognizes that the emotional, mental, spiritual and physical elements of each person comprise a whole system that is interconnected, and balanced. This approach attempts to treat the whole person, concentrating on the cause of the illness as well as symptoms. This approach often avoids pharmaceutical drugs and focuses on alternative medicine such as naturopathy, homeopathy, chiropractic, and acupuncture. (Wikipedia contributors, 2006).

Lifestyle. Lifestyle is defined as the typical way of life of an individual, group, or culture with its resulting consequences. This consists of consumption, dress, entertainment, and social relations (Wikipedia contributors, 2005). Nedley defines lifestyle as what we put into our bodies and what we do with our bodies (Nedley, 1999).

Nutrients. Nutrients are defined as “the chemical substances found in food and sunlight that provide the nourishment essential for growth and the maintenance of life” (Brown, 1999).

Nutrition. Nutrition is defined as the process of providing or obtaining the nutrients (substances) necessary for optimum health and growth (Nugent, 2004).

Oxidative Stress. Oxidative stress is medical terminology for damage to animal and human cells that ultimately results in damage to the organs and tissues they comprise. It is caused by an imbalance between pro-oxidants and anti-oxidants with the former being dominant. Oxidative stress is thought to be one cause of neurodegenerative diseases such as Lou Gehrig’s disease (aka MND or ALS), Parkinson’s and Huntington’s disease (Wikipedia contributors, 2006).

Prion. A prion is an unidentified infectious agent thought to cause a group of diseases known as Prion Diseases or transmissible spongiform encephalopathies. Well-known prion diseases are Creutzfeldt-Jakob disease (CJD) and kuru in humans, scrapie in sheep, bovine spongiform encephalopathy (BSE), also called "mad cow disease," in cattle, and chronic wasting disease in deer and elk (wapiti). The diseases slowly attack brain tissue, often leaving sponge-like holes. They are characterized by accumulations of abnormal forms of a protein, called prion protein, which, unlike viruses or bacteria, contain no genetic material and have no known ability to reproduce themselves. Normal prion proteins occur naturally in brain tissue. The abnormal form differs in shape from the normal prions and is not susceptible to enzymes that normally break down proteins. In the brain, abnormal prions appear to increase their number by directly converting normal prions (Nedley, 1999).

Saccharide. Saccharide is defined as the chemical name for sugar (Nugent, 2004). Sugar is a compound of carbon, hydrogen, and oxygen belonging to a class of substances called carbohydrates. Sugars fall into three groups: the monosaccharides, disaccharides, and trisaccharides. The monosaccharides are the simple sugars that include fructose and glucose. The disaccharides are formed by the union of two monosaccharides with the loss of one molecule of water. Disaccharides include lactose, maltose, and sucrose. Less well known are the trisaccharides; raffinose is a trisaccharide present in cottonseed and in sugar beets (Saccharide, no date).

Toxin. A toxin, in a scientific context, is defined as a biologically produced substance that causes injury to the health of a living thing on contact or absorption, typically by interacting with biological macromolecules such as enzymes and receptors.

Toxicity may be acute (as in a bee sting), chronic (as in the Guam cycad toxin), or both. In the context of complementary medicine, the term is often used as a broader category of any harmful substance claimed to cause ill health (Wikipedia contributors, 2005).

Toxicology. Toxicology is “The scientific study of poisons, their effects, their detection, and the treatment of the conditions produced by them” (Webster, 1983).

Methodology

Literature from the fields of allopathic medicine, naturopathic medicine, nutrition, human ecology and glycoscience will be reviewed. From these sources, conclusions will be drawn and recommendations made for children and adults to maximize nutrition, improve lifestyles and minimize exposure to toxins. I will attempt to focus on research that is based on the latest scientific findings and not skewed by medical, industrial or political bias.

Chapter II: Literature Review

Introduction

This chapter will continue discussing in detail, the problems of and solutions for the detrimental effects of modern lifestyle on human health. Specifically, it will address the topics of nutrition and diet, and disease and toxins, as integral parts of those problems and solutions.

Nutrition and Diet

In Chapter One it was stated that part of the solution for the problematic effects of modern lifestyles and toxins on human health is a new framework of understanding. This new framework must explore the holistic relationship between nutrition and health. (Campbell, 2005). Specifically, a framework is needed that is current and based on real science instead of industry propaganda or on individual self-serving agendas. As previously stated, many people in the Western world and their children are eating substandard and unhealthy food; food that is laden with chemicals, depleted in nutrients, and containing too much fat, salt, and sugar and too little fiber. To correct this situation and begin the healing process we need to understand some basics about nutrition and diet. We need to start by learning what constitutes wholesome food and a wholesome diet (Campbell, 2005).

A wholesome diet consists of non-toxic foods that offer the best balance of all the nutrients your body needs to promote natural healing and maintain optimal health (Nugent, 2004). It involves not only what we eat but also a method of how and when we eat (Nedley, 1999). If a person's health and schedule will allow it, two larger meals a day are better than three or more smaller ones. Studies indicate four meals a day as opposed

to two doubles the risk for colon cancer (Nedley, 1999). A hearty breakfast should be eaten, including nuts, grains, and fruit because these foods are rich in vitamins, minerals, and fiber, which are essential for optimal health. Research has shown that eating a hearty breakfast actually increases longevity; helps prevent weight gain, reduces the risk of heart attack, improves blood hemoglobin level, balances blood sugar and improves thyroid function (Nedley, 1999). Nedley also recommends waiting until lunchtime if possible to eat the second meal of the day consisting of wholesome foods such as hardy vegetables and legumes. He further admonishes that no food be eaten between meals unless medically recommended for a specific situation. If a third meal of the day has to be eaten then it should be a light meal such as fruit that does not take the body as long to digest (Nedley, 1999). This is of course, is the reverse of modern Western societal norms with breakfast and lunch being light and the evening meal heavy and oftentimes later in the evening. However, research indicates that the evening or last meal of the day should be low in sugar, and light in density and proteins, and eaten as early as possible (as long as possible before bedtime) (Nedley, 1999). This will help prevent weight gain and provide ample rest for the entire body, including the brain and digestive system, which will promote healing and help maintain optimal health (Nedley, 1999). In addition, meals should be psychologically wholesome, in that they should be stress-free happy occasions with tasty attractive foods that facilitate proper digestion and utilization of nutrients. Food should be eaten slowly and chewed well which facilitates proper digestion and utilization of nutrients. (White, 1905). Overall, eating should be an enjoyable experience free from worry and deprivation (Campbell, 2005).

There is currently a state of increased awareness about nutrition in the United States; however, Americans are drowning in a sea of erroneous nutrition information (Campbell, 2005). Very little of the nutrition information that the public accepts and retains is based on valid science. It is frustrating for the consumer because one day the “experts” might say that eggs will clog your arteries with plaque, and then the next day they are suddenly a good source of minerals. On the other hand, they might say that potatoes and rice are great and then change their mind and declare them to be dangerous carbohydrates that are grave threats to our weight. Therefore, the average consumer does not really know what to believe (Campbell, 2005). In the following section, the principles of good nutrition and diet will be introduced via a new framework of understanding nutrition and health. In the writing of this section, I will draw largely on the very recent research conducted in China, and the resulting book written by Campbell (2005) called *The China Study*. It is the most comprehensive, unique, national study of nutrition and disease ever conducted. It involved 880,000,000 Chinese people and spanned three decades. Campbell was extremely fortunate to be able to use and study such an immense amount of data, on so many people, recorded over such a long span of time. The opportunity he was given was truly a researcher’s bonanza and the chance of a lifetime. The research was actually first started by the Chinese Premier Chou EnLai in the 1970s when he commissioned a nation-wide survey on cancer in China. The premier was dying of cancer himself and wanted to learn more about this disease. This national survey was the most ambitious biomedical research project ever attempted and employed a whopping 650,000 workers to gather information from 2,400 Chinese counties. When Campbell and associates completed their research of 30 plus years of Chinese survey data, and their

own additional independent health study, they had a grand total of more than 8,000 statistically significant associations between lifestyle, diet, and disease variables (Campbell, 2005). The reason for Campbell's independent health study was to obtain additional evidence of the direct relationship between lifestyle and disease. This study was much smaller than the original 30-year Chinese survey but was much more comprehensive. It employed a world-class scientific team of very prominent doctors and scientists with Campbell at the helm as project director. It included the study of about 50 kinds of disease including infectious, cardiovascular, as well as cancers on 6,500 Chinese people across 65 Chinese counties. Campbell is an eminent professor of nutritional biochemistry, researcher, and author with 40 years of combined experience in research, education and government (Campbell, 2005).

It is beyond the scope of this paper to list and discuss all the wholesome foods and their individual nutritive properties and recommended amounts, however, a general overview of wholesome food and a wholesome and healing diet will be presented. Specific information can be found in the following books: Proof Positive (Nedley, 1999), Nutrition Now (Brown, 1999), The Wellness Encyclopedia of Nutrition (Margen, 1992), and The China Study (Campbell, 2005), Prescription for Nutritional Healing Second Edition (Balch & Balch 1997), Eating Alive – Prevention Thru Good Digestion (Matsen 1987), Toxic Relief (Colbert 2001) and How to Survive on A Toxic Planet (Nugent, 2004), which I found to be excellent sources of information on individual foods, food types and their benefits. These books, as well as other dietary and health references, are listed in the reference section of this paper.

To start with, the nutrients that have been discovered (and there may be some that have not been discovered) can be divided in to two main groups: Macronutrients and Micronutrients. The macronutrients group includes; water, proteins, fat, carbohydrates and fiber, all of which, in the proper type, and amount, are vital to optimum human health (Campbell, 2005). The micronutrients group consists of vitamins, minerals, glyconutrients, phytonutrients, phytohormones, essential fatty acids, and antioxidants; all of which, in the proper type, and amount, are vital to optimum human health (Nugent, 2004).

The first and perhaps most important nutrient to consider is water. The need for a liberal, daily intake of water cannot be overstressed. A variety of diseases and problems such as heart disease, stroke, high blood pressure, kidney stones, bladder stones, urinary tract infection, may be postponed, or even prevented by drinking a sufficient amount of water (Nedley, 1999). Water is a basic requirement of all forms of life. Water is the largest single component of our body and our diet and it is a vital part of many human metabolic processes. Approximately 72% of the non-fat mass of the human body is made up of water. Significant quantities of water are used during the digestion of food. More water is lost from the body in the form of urine, feces, sweating, and by exhalation of water vapor in the breath. To function properly and avoid dehydration the body requires, (depending on the person, activity and environment), between one and seven liters of water daily. The latest recommendation from the National Research Council recommends a daily average of 2.7 liters of water total (including food sources) for women and a total of 3.7 liters for men if they are inactive and living in a temperate climate. This general guideline amount increases as the ambient temperature and amount of activity increases.

This guideline is total water, which includes water in food, and drinks other than pure water, such as coffee, tea, soda pop, juice. In addition, humans need water that does not contain excess salt or other impurities such as chemicals or harmful bacteria (Wikipedia Contributors 2006). An important point to remember about water in the human body is its vital role in the metabolic functions of transporting nutrients and waste products to and from cells providing a medium for many chemical reactions. It allows the proper formation and maintenance of human fluids and substances including blood. Water also assists in energy formation, acts as a lubricant, and assists in regulating body temperature. It is apparent from the preceding that insufficient water (dehydration) in the human body has the potential of causing a myriad of health problems (Brown, 1999).

The next macronutrient on the list is protein. The word protein is taken from the Greek word proteios and means “of prime importance”. Protein is in fact very important and health sustaining when the proper type and amount is ingested. Two imperative points to make about protein is its recommended source and the amount to be ingested. Many people believe that animal products are the best source of protein (Campbell, 2005). However, the truth is that there are virtually no nutrients, including protein, found in animal-based foods that cannot be found in plants grown in nutrient complete soil. In addition, the nutrient composition of these two types of food is very different. Plant foods contain considerably more antioxidants, fibers, and minerals (which are vital to human health) than animal foods. Animal foods are severely lacking in these nutrients. To make matters worse animal foods contain much more cholesterol, fat, and other harmful substances that cause cardiovascular and other diseases (Campbell, 2005). Specifically, animal fats contain toxins that are harmful to humans (Nedley, 1999). Overall, animal

foods do have slightly more protein than plant foods, as well as more B12 (Campbell, 2005). However, Americans on the average currently ingest too much protein, and plant foods do contain a high quality and adequate amount of protein. Some nuts and seeds are actually higher in fat and protein than animal foods. However, the fat and protein in nuts and seeds is different and much more healthful than the fat and protein in animal foods. The nuts and seeds also contain health inducing anti-oxidant substances, which are not found in animal foods. There are four nutrients contained in animal foods that are not as readily found in plant-based foods: Cholesterol, vitamin A, vitamin D, and vitamin B12. In most cases, our bodies naturally produce an adequate supply of cholesterol. Vitamin A can readily be made from beta-carotene found in wholesome foods. Vitamin D can be made by simply exposing our skin to 15 minutes of sunshine every couple of days. Caution must be exercised, as both of these vitamins are toxic if consumed as isolated supplements in too high amounts. This is another indication that it is better to rely on the vitamin precursors, beta-carotene and sunshine, so that our bodies can control the timing and quantity of vitamins A and D needed. The timing and quantity of nutrients as regulated by the body is of utmost importance for optimal health. The one vitamin that might be problematic in a vegetarian diet is B12. It is made by microorganisms in the soil and by microorganisms in the intestines of animals, including our own. The amount made in our intestines may not be adequately absorbed, so it is recommended that we consume extra B12 in our food. Research has definitely shown that plants grown in healthy soil that has a good concentration of B12 will readily absorb this nutrient and pass it on to the eater. However, plants grown in depleted soil may be deficient in vitamin B12, so high quality supplements may be necessary (Campbell, 2005).

Americans are now consuming an average of 17% of their diet in protein whereas the recommended daily allowance is only 10%. Campbell's research shows that humans could live adequately on as low as 5% protein, with 7% plant-based protein being optimal for preventing and even reversing disease. In addition, his research indicates that an intake of protein above 10% significantly increases the risk for disease (Campbell, 2005). Protein is discussed further in the disease section of this paper. For a recommendation on what foods provide the best source of protein consult Nedley's (1999) book, *Proof Positive*, and Campbell's (2005) book *The China Study*.

The next important nutrient this paper will discuss is fat. Some people believe that they should remove most or all fat from their diet. However, this is not true, because human beings need a certain amount of the right type of fat in their diet for good health. As previously stated, the fat and protein in nuts and seeds is different and much more healthful than the fat and protein in animal foods (Campbell, 2005). Australian and international studies have concluded that more than 95% of human exposure to toxins occurs through consumption of food. Toxins such as Dioxin are absorbed into the animal fat and increase in concentration (bioaccumulate) as they migrate up the food chain. Humans are at the top of the food chain. When people eat food contaminated with dioxins these chemicals can remain in a person's body's fat stores for long periods of time or even indefinitely (Food Standards Contributors, 2004). Toxins are stored in fatty tissues of animals we eat and then are subsequently stored in human fatty tissues (Colbert, 2001). Since the "brain is composed of about 60% fat, some of these poisons will end up being stored in it as well as in the breasts, prostate gland and any other fatty tissue in the body" (Colbert, 2001, p. 15).

Even though your body is designed to eliminate such dangerous poisons, the sheer amount of them that you encounter daily in our modern polluted world is far more than your body was ever designed to deal with. Therefore, pesticides, their metabolites and other dangerous toxins eventually build up in your body over time. In addition, the greater the buildup, the more difficult it becomes for your body to eliminate them. When such a residue of pesticides builds up in your body, you begin to experience the following symptoms or diseases: Memory loss, depression, anxiety, psychosis, other forms of mental illness, Parkinson's and other forms of neurological degeneration and possibly hormone-sensitive cancers such as breast and prostate cancer. (Colbert, 2001, p. 11-12)

As previously stated, it is important to have some fat in our diet as it helps the body transport some vitamins through the blood stream. It is also a good source of energy and of essential fatty acids, which the body cannot produce on its own. Essential fatty acids are important for proper growth and development of infants, and for controlling blood pressure, blood clotting, and inflammation. Fats also promote a sensation of feeling full (satiated) after eating. However, ingesting an excess of fat produces an excess of human caloric energy which will likely result in weight gain if not worked off (Margen, et al, 1992). Although a relatively low-fat diet is important, the type of fat we eat is also important. People need to cut down on foods that are high in saturated fat or trans fats and replace them with foods that contain unsaturated and low or no trans fats. They should also be ingesting more omega 3 fatty acids, which are found in fish (Brown, 1999). However because of all the toxins that are now prevalent in fish a much healthier source of omega 3 fatty acids can be found in plant foods (Nedley, 1999).

Ingesting too much saturated fat can increase the amount of cholesterol in the blood, which increases the chance of developing heart disease. Some evidence suggests that the effects of trans fats may be worse than saturated fats. However, most people eat a lot more saturated fat than trans fats. Trans fats can be formed when liquid vegetable oils are turned into solid fats through the process of hydrogenation. Foods containing hydrogenated vegetable oil, which must be listed in the ingredients list on the label, might also contain trans fats (Wikipedia Contributors, 2005). For information on which foods contain which fats, see the following site:

<http://www.eatwell.gov.uk/healthydiet/nutritionessentials/>.

The next important nutrient this paper will discuss is fiber. An ample supply of fiber in the diet is very important because it helps clean the digestive system and helps regulate body functions (Nedley, 1999). Most Americans consume much less than the recommended 25 to 30 grams per day. An insufficient amount of fiber in the diet can lead to a host of health problems such as heart disease, stroke, diabetes, bowel cancer, colon polyps, gallbladder disease, Hiatus hernia, diverticulitis, appendicitis, ulcers, varicose veins, hemorrhoids, heartburn and constipation. An abundant supply of dietary fiber can be obtained in a whole-foods, plant based (vegetarian) diet, which includes grains, legumes (beans), fruit and vegetables (Nedley, 1999). Dietary fiber includes plant non-starch polysaccharides (e.g. cellulose, pectin, gums, hemicellulose, β -glucans, and fibers contained in oat and wheat bran), plant carbohydrates that are not recovered by alcohol precipitation (e.g. inulin, oligosaccharides, and fructans), lignin, and some resistant starch (Health Canada Contributors, 2006).

The next macronutrient to consider is carbohydrates. Low carbohydrate diets have recently become very popular. These diets operate on the theory that a drastic reduction of carbohydrates and a substantial increase in protein and sometimes fat will promote weight loss. This hypothesis has resulted in many unbalanced fad diets that are not only erroneous but also dangerous to human health (Campbell, 2005). Contrary to the claims of these fad diets human beings need carbohydrates for a balance of energy, protein, and fiber. Diets that seek to upset this balance by replacing carbohydrates with excess protein cause excessive strain on the kidney and liver, and can lead to serious maladies such as obesity, heart diseases, adult diabetes, breast, colon, and prostate cancer, gallbladder disease, osteoporosis, kidney failure, kidney stones, multiple sclerosis, rheumatoid arthritis, constipation, diverticulosis, hemorrhoids, hiatal hernia, osteoporosis and kidney stones (McDougall, 2002). These fad diets can recommend up to 30% protein, which is much more than the recommended intake for active people and may indeed damage a person's health. This high protein diet may be especially harmful for anyone with renal disease or other conditions requiring a special diet. Millions of people are desperate to lose weight with the easiest method possible. However, low or no carbohydrate diets are not the magic pill to lose those pounds and keep them off. These diets are popular because they tell people they can eat mega amounts of protein, which tastes good (Campbell, 2005). They are also popular because they do drop some initial weight in the form of water, which is very impressive to the uninformed. This is because stored carbohydrates do contain large amounts of water. Therefore decreasing carbohydrates also decreases the amount of water, which lowers body weight. If the diet is low enough in carbohydrates the body will go into ketosis, which causes a loss of appetite, whereby

you eat and suffer less and lose even more weight. However, there is a limited time you can stay in ketosis because of its unpleasant side effects. The end result of these diets is that the weight loss is immediate, but not long term, and they can create dangerous side effects like increased risk of the diseases just mentioned (McDougall, 2002). The truth is there is no magic short cut to undo all the pitfalls of a modern Western diet. The only safe way, to fully satisfy your appetite with delicious foods, and stay trim and healthy for a life time, is to eat in moderation, a starch based diet comprised of fruits, nuts, grains, and vegetables and engage in some form of exercise (Campbell, 2005). Complex carbohydrates are the best because they take longer to digest and are found in foods like whole grain products, vegetables, and fruits. They are released more slowly into the body, unlike simple carbohydrates that induce a sugar high followed by the unpleasant and unhealthy sugar low. All carbohydrates are broken down into sugars during digestion, but complex carbohydrates are the better choice because they are naturally low in fat, high in fiber and provide essential vitamins and minerals (Waechter, 2006).

The remainder of the nutrients, namely the micronutrients, can all be found in varying degrees in a whole-foods plant based diet consisting of fruit, nuts, grains and vegetables (Campbell, 2005). It is beyond the scope of this paper to report on them individually because they are too numerous. However, it is very important to note that if the plant foods listed directly above have been grown in depleted soil, as a lot of commercial plant foods are today, they will be missing some of the vital nutrients required for optimum health (Nugent, 2004). The problem gets even worse when foods are harvested green to prolong shipping and shelf life, because the nutrient composite of the plant is incomplete. In addition, even more nutrients are lost due to heat damage

during cooking. To compensate for the missing nutrients of depleted soil, refined foods, poor food choices, cooking and premature harvesting, Nugent (2004) takes a slightly different approach than Campbell's approach described below. He admonishes that quality whole food supplements are not an option in our modern world, but imperative. However, people simply cannot ingest enough (nutrient depleted) plant food to obtain all the nutrients needed to fight the ravages of a toxic environment and oxidative stress and maintain optimum health. Because of the amount of environmental toxins that 21st century humans are subjected to, supplements are necessary to make sure that the body is getting everything needed to maintain a strong, healthy, immune system. This is especially true regarding the need for the eight essential monosaccharides called glyconutrients (Nugent, 2004).

A new framework of understanding can be further established by breaking nutrition and diet down into some basic principles.

Principle number one states that human nutrition is made up of combined activities of countless nutrient substances. The whole is greater than the sum of its individual parts; meaning that the human body is a holistic system (Campbell, 2005). This point can be illustrated by examining the biochemical nomenclature of an individual meal. For example, if a person were to eat a normal meal at a buffet consisting of a lettuce and raw vegetable salad, two additional cooked vegetables, mashed potatoes, grilled salmon, whole-wheat bread, and a cherry crisp dessert he or she would be ingesting a large conglomerate of chemical nutrients. These nutrients interact with each other and interact with the body's chemicals in a myriad of reactions. It is an extremely complex process which science does not yet fully understand (Campbell, 2005). These nutrients/

chemicals are carefully orchestrated by intricate controls within our body cells, organs and systems. These controls decide and specify the route and destiny of each nutrient according to the myriad of reactions that need to take place. Humans were designed to derive maximal nutritional benefits from whole foods as they appear in nature not in synthetic or isolated nutrients haphazardly tossed into the stomach. Considering the extreme complexity of the human digestive system, Campbell feels it makes little or no sense to throw a few synthetic supplements into our stomachs and hope they fit perfectly into the massively complex human digestive scheme and cure all our ills. It is just not that simple. The pitfalls of a Western diet and lifestyle cannot be instantly reversed by consuming individual supplements. Unfortunately, this false belief about the supposed miracles that supplements can perform has created a multibillion-dollar nutrient supplement industry that is raking in enormous profits. In actuality, taking supplements by themselves will not lead to long-lasting health, and may actually cause unforeseen side effects such as hindering other nutrient processes or even creating a toxic reaction. Our bodies have learned how to benefit from the chemicals in food as they are presented in nature, discarding some and using others as it sees fit (Campbell, 2005). This, however, is not license to dump unnatural and toxic substances into our bodies thinking our body will simply discard anything that is not needed. Substances such as preservatives, excess sugar, excess fats, alcohol, leached packing materials, animal pharmaceuticals, synthetic supplements, chemically altered food, and growth hormones can and do cause damage to the human system (Nedley, 1999). One example of data that exhibited the ineffectiveness of isolated supplements was a large study on the effects of beta-carotene (a precursor to vitamin A) supplements on lung cancer and other diseases. This study could not offer any

conclusive evidence that beta-carotene had any effects on these diseases (Campbell, 2005). A recent special article in the New York Times also documents this failure to provide proof of isolated nutrient supplements to provide any proven health benefit (Kilata, 2003). On the other hand, one cannot say that these individual nutrients are not important. They are important, but are best when consumed as part of food, not as isolated, supplements (Campbell, 2005). Taking excess amounts of isolated supplements can produce adverse reactions. Taking excessive amounts of one vitamin or mineral can actually produce an imbalance in the uptake and utilization of other vitamins and minerals. Improper interactions between substances may cause a decrease in the absorption of needed nutrient substances (Campbell, 2005). Many people are unaware of these potentially harmful interactions. The message here is that no one should take large doses of supplements without careful consideration. There are, of course exceptions in certain disease situations where large doses of vitamins can be beneficial. However, such supplements should be taken under the direction of a physician or medical professional who is well aware of the chemical complexities and the associated risk (Nedley, 2004). The safest and most natural way to obtain the nutrition necessary for good health is to eat an abundance of fruits, grains and vegetables” and also a moderate amount of nuts. These whole foods provide the benefits of the nutrients that modern science has already identified as well as the nutrients and processes that have not yet been discovered (Nedley, 1999).

Principal number two states that it is possible to get all nutrients necessary for human life from plants rather than animals. However, the amount of some nutrients such as Vitamin B12, Vitamin D, and essential fatty acids that is contained in plants remains

controversial (Campbell, 2005). In light of principle number one directly above, there is another important question to be answered. What if a person's diet, even a vegetarian diet, through no fault of their own, does not contain all the nutrients necessary for optimum health? Several scenarios could produce this deficiency such as economics, location, soil depletion, and other causes. In these cases proper whole plant based supplements are in fact a necessity (Nugent, 2004). Considering the problem of soil depletion, much of the agricultural soil in the United States is nutrient depleted from many years of abuse. This abuse comes in the form of one or more of the following: improper crop rotation, improper field management that allows erosion, continual overuse, and unnatural pesticides, herbicide and fertilizers. Consequently, the soil is often nutrient incomplete and no longer provides the plants with the all the mineral elements essential to produce plants that will in turn contain all the nutrients necessary to maintain optimal human health (Nugent, 2004). An article in Life Extension Magazine entitled *Vegetables without Vitamins* states that the United States Department of Agriculture recognizes that a vast amount of our food today does not contain the nutrients that it did 50 years ago. Over 100 fruits and vegetables in North America have decreased in nutrient content by an average of 50% from 50 years ago, (Life Extension Magazine Contributors, 2001).

Many large corporate farms of today do not practice proper soil maintenance; they just add three or four ingredients (nitrogen, phosphorous, potassium and sometimes calcium) to depleted soil and simply replant another annual crop. These four basic ingredients do actually allow the plants to grow but they are nutritionally incomplete, lacking many of the nutrients that humans need for optimal health. Experts say that

humans need at least 42 minerals and maybe more. Keep in mind that minerals are only one category of essential human nutrients (Nugent, 2004). In light of the foregoing on soil depletion it is recommended that vitamin B12 supplementation be taken and in as small amounts as needed. It is estimated however, that human beings on the average, hold a three-year store of vitamin B12 in their bodies. There are exceptions to the rule and some people are anemic and require additional B12 (Campbell, 2005). Nedley (1999) states that Vitamin B12 may be obtained in some plants such as soybeans, barley, spinach, and others. However, whether the amount of B12 found in normal servings of these edible plants is an adequate required daily allowance remains controversial. A vitamin D supplement may also be taken in moderation if a person is unable to be exposed to sufficient sunlight (Campbell, 2005).

Principal number three states that proper nutrition can arrest or even reverse disease. The research indicates that genes do not cause disease on their own (Campbell, 2005). Genes operate only by first being activated, or expressed, and nutrition plays a critical role in determining which genes, good and bad, are expressed. It appears that the origin of every disease is genetic. Genes are the code to everything in our bodies, both good and bad. If there were no genes, there would be no cancer. If there were no genes, there would be no obesity, no diabetes, and no heart disease. However, without genes there would be no life. Science is currently spending hundreds of millions of dollars trying to ascertain which genes are the ones that cause disease. A large portion of the resources of science and health in the last ten years has been shifted to genetic research. This huge focus on genetics however, misses a simple but crucial point about human health. That point is that not all genes are completely expressed at all times. If they are

not activated, or fully expressed, they are in effect biochemically dormant. Dormant genes, contrary to the opinion of some, do not have any effect on our health. Therefore, it becomes a question of why some genes remain dormant and others are activated to cause disease. The answer to this huge question is found in our environment and especially in our diets. It is helpful to think of genes as seeds. Seeds will not activate or grow unless they have nutrients, proper soil, and sunshine. In the same vein, genes will not activate unless they have the proper environment. In the human body, the activating agent for genes is nutrition. Research has shown (Campbell, 2005) that the genes that cause cancer are profoundly impacted by the consumption of protein. Further research indicates that simply adjusting the amount of animal protein intake could activate or deactivate the so-called bad genes depending on the amount. This was proven by the China research, which showed that people who consumed more animal products had a higher rate of cancer even though they had the same genetic pool and same environment. Furthermore, the disease rates changed over time quite drastically with the amount of animal products that were consumed. Therefore, it is biologically impossible to put the blame on genes only. In summary, genes are crucial to every biological process but gene expression is controlled by environment and especially nutrition. It must be noted that the expression of our genetic code represents a universe of biochemical reactions of almost infinite complexity and science may never understand it in its entirety (Campbell, 2005).

Principal number four states that nutrition can be used to substantially control the damaging effects of noxious chemicals (Campbell, 2005). Chemicals that are initiated into the body and have the potential to cause many types of symptoms and diseases can be minimized or subdued with proper nutrition. Likewise, they can be accelerated or

inflamed by improper nutrition. An example of this is a study of rats that were administered large doses of aflatoxin, a naturally occurring, highly carcinogenic fungal toxin found on moldy peanuts and corn. Rats that were consistently fed low-protein diets remained healthy and cancer free even in the presence of this potent carcinogen (Campbell, 2005). “Aflatoxins have received greater attention than any other mycotoxins because of their demonstrated potent carcinogenic effect in susceptible laboratory animals and their acute toxicological effects in humans” (Saad, 2004).

Principal number five states that the same nutrition that prevents disease in its early stages (before diagnosis) can also halt or reverse disease in its later stages (after diagnoses) if there is ample time to do so. There is a general conception that breast cancer can actually be initiated as early as adolescence and not fully develop until after menopause. Studies in animals have shown that even after cancer is initiated and growing, it may be slowed, halted, or even reversed by good nutrition. In humans, there have been studies showing that a plant-based diet can help obese people lose weight, diabetics decrease or terminate their medication and can even reverse advanced heart disease. Research has also proved that advanced skin cancer (melanoma) can be reduced or even reversed by lifestyle changes (Campbell, 2005).

There are, of course, some diseases that are terribly stubborn and appear to be irreversible such as autoimmune diseases (Campbell, 2005). It seems that once the body turns inwards and attacks itself it may become unstoppable. There is some hope, however as some of these diseases seem to be slowed by proper diet. An example of this is Type 1 diabetes, where the right diet can lessen the amount of required medication. Still other examples are rheumatoid arthritis and multiple sclerosis that have been shown to be

slowed by diet (Campbell, 2005). The key here is to prevent diseases in the first place with wholesome natural food. However, even after a person contracts a disease, nutrition can still play a vital role in fighting and or conquering that disease.

Principal number six states; complete, wholesome nutrition that is truly successful in fighting one chronic disease will support health in all areas of the body. Even though specific diseases have different symptoms and development rates they still have much in common. It is because of these commonalities in composition and mode of operation that the same plant-based whole-food diet will fight and prevent different types of disease and improve overall health. Good nutrition promotes health in all areas of our existence, as all parts are interconnected (Campbell, 2005).

Principal number seven states that the process of eating is one of the most intimate encounters with our environment. The substances ingested literally become part of our bodies during this process. However, other intimate experiences are also important; experiences such as exercise, good mental health, the well-being of both other people and planet Earth. Incorporating all of these values into a life philosophy creates a holistic, well-balanced outlook on life where it becomes much easier to feel content and happy. When people feel better they are more inclined to eat healthier and get more exercise because they have more energy. It becomes an upward spiral that leads to a better quality of life (Campbell, 2005).

In summary, the principals outlined in this chapter help create a new framework of understanding nutrition and health. The importance of these principals is vital to human life and should not be mitigated. If studied and applied, they will minimize industry propaganda and reduce much of the confusion regarding nutrition and health.

This will give us the knowledge to invest our societal resources wisely to improve our health and the health of our environments and planet (Campbell, 2005).

Disease and Toxins

It is beyond the scope of this paper to list and discuss all the diseases and toxins in the United States and the world that adversely affect human beings. However, a general overview of some of the major chronic diseases and damaging toxins that are currently prevalent in the United States and Western world will be presented in this chapter. Some suggestions on minimizing the exposure to and effects of toxins will also be presented in this chapter. Much more specific information can be found in Nedley's (1999) book *Proof Positive*, Nugent's (2004) book *How to Survive on a Toxic Planet*, Campbell's (2005) book *The China Study* and Colbert's (2001) book *Toxic Relief*.

Disease

Obesity, diabetes, cancer, cardiovascular diseases, muscular diseases, and autoimmune diseases, contrary to popular belief are not necessarily genetic, even if there is a genetic predisposition. These diseases are caused largely by polluted toxic environments and lethargic, television watching, computer surfing lifestyles. In spite of all our medical and technological advancements, these deadly, chronic diseases are still on the incline (Nugent, 2004).

Obesity and Diabetes. What is the actual problem with obesity? The answer is; that besides the physical drawbacks of being overweight such as restricted physical activities, and the embarrassment, there are even bigger problems. The extra weight is hard on several internal organs and systems and on the musculoskeletal frame. Second, it puts people at high risk for many deadly diseases such as cancer, diabetes, heart attack,

and stroke (Nedley, 1999). One of the reasons there is so much obesity in the United States is that Americans spend more time sitting and are less physically active than ever before (Campbell, 2005). Another reason is the typical low quality American, diet. It is therefore, not hard to imagine why both obesity and diabetes are increasing at a frightening rate. It is very important to note that both diabetes and obesity are merely symptoms of larger problems of poor general health. They rarely exist in isolation of other diseases and often forecast deeper, more serious health problems such as heart disease, cancer and stroke (Campbell, 2005). Two of the most frightening statistics show that diabetes among people in their thirties has increased 70% in less than ten years and the percentages of obese people has nearly doubled in the past 30 years. Such an incredibly fast increase in these 'signal' diseases in America's young to middle-aged population forecasts a health care catastrophe in the coming decades. It may become an unbearable burden on a health system that is far less than perfect and is already strained in countless ways. From 1990 to 1998, the rate of increase of diabetes has increased an average of 47% for adults aged 30 to 59 (Campbell, 2005). This is a very alarming increase given the terrible results of diabetes such as heart disease, stroke, blindness, kidney disease, nervous system disorders, high blood pressure, limb amputations, dental disease, and others. (American Diabetes Association Fact Sheet, 2006). Indeed, these increases are unprecedented. One out of 13 Americans now has diabetes, and that ratio continues to rise (Campbell, 2005). It is especially alarming that the progressive type of diabetes Type 2, non-insulin dependent mellitus) can go on for years or decades without being diagnosed and cause irreversible damage such as blindness, kidney disease, nerve problems or heart attack. It is even more alarming that Type 2 diabetes which is referred

to as primarily an adult disease is now being found in children and adolescents at an increasing rate. If this trend cannot be reversed, it will not only cause untold misery and suffering, but will also create a catastrophic drain on our medical and financial systems. Stated plainly, if America does not improve its unhealthy diet and cut back on the sugar, grease and refined foods, millions of additional children and adults will unknowingly develop diabetes. They will also suffer the terrible consequences of blindness, limb amputation, cardiovascular disease, kidney disease, cancer and premature death (Campbell, 2005). Indeed, some fear that this is already imminent and will be a medical disaster in the not too distant future (Nugent, 2004).

One of the deadly results of an improper diet can be directly linked to diabetes (Nedley, 1999). Diabetes is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes can be associated with serious complications and premature death, but people with diabetes can take steps to control this disease and lower the risk of complications. Type 1 diabetes was previously called insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes. Type 1 diabetes begins when the body's own immune system destroys pancreatic beta cells, which are the only cells in the body that make the hormone insulin that regulates blood glucose. This type of diabetes usually afflicts children and young adults, although disease inception can start at any age. Type 1 diabetes may account for 5% to 10% of all diagnosed cases of diabetes. Risk factors for type 1 diabetes include autoimmune, genetic, and environmental factors (Nedley, 1999).

Type 2 diabetes was previously called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes accounts for approximately 90% to

95% of all diagnosed cases of diabetes. It usually begins as insulin resistance, a disorder where the cells do not use insulin properly. As the need for insulin increases, the pancreas gradually loses its ability to produce insulin (Nedley, 1999). Type 2 diabetes is associated with certain risk factors such as older age, obesity, family history of diabetes, prior history of gestational diabetes, impaired glucose tolerance, physical inactivity, and race/ethnicity. African Americans, Hispanic/Latino Americans, Native Americans, and some Asian Americans, Native Hawaiian, or other Pacific Islanders are at particularly high risk for type 2 diabetes. Type 2 diabetes is increasingly being diagnosed in children and adolescents. A third type of diabetes occurs during pregnancy and is called Gestational diabetes (Nedley, 1999).

Cancer. Medical science has waged a long hard war against cancer but has not won. Cancer is still the second leading cause of mortality in the United States. Estimated, total cancer deaths in the United States for 2006 will be over 560,000 victims. The cancer death rate (rate per 100,000) was only slightly less in 2002 than it was in 1975. Most specific types of cancer death rates have remained similar over the past 70 years with the exceptions of lung cancer, which showed an approximate 1600% peak increase in men and 800% in women since 1930 but is currently decreasing in both genders. The other notable exception is stomach cancer, which has actually decreased by approximately 600% in men and women for the same period. The lifetime expectancy of an American man to contract cancer is 1 in 2 and for an American woman is 1 in 3 (American Cancer Society Contributors, 2006). Some good news about cancer is that recent research shows that cancer can be turned off and even prevented by lifestyle and diet (Campbell, 2005).

A simplified explanation of the cancer process is as follows: there are three stages in Cancer: 1) initiation, 2) promotion and 3) progression (Campbell, 2005). In the case of human or animal cancer, this final stage is usually fatal. Cancer cells (carcinogens) enter the body as chemicals or as physical agents. In our modern industrial world, most people are exposed to hundreds or even thousands of them (Campbell, 2005). Their potential course of action is to transform (mutate) normal cells into cancer-prone cells with the help of enzymes. This mutation damages the DNA and results in an alteration of the genes of the once normal cell. Most of the time the human body can repair the DNA, however, occasionally a cell multiplies before the body has a chance to repair it and a permanently damaged cell with a genetic defect is created. This damaged cell has the potential to, in turn, pass its defect on to newly formed cells.

As stated above, cancer is a terrible and dreaded disease, however, there is some good news about cancer; valid research indicates the genetically altered cancer prone cells will not grow without the right environment. In other words, the research has indicated that it is possible to keep the promotion stage of cancer in remission given the right circumstances. This is where healthful living comes into play. Proper lifestyles and diet has the potential to hold these cancer-prone cells in check by robbing them of the environment that will allow them to grow and flourish (Campbell, 2005). Valid research in India, China and the United States has confirmed that one way to hold these cancer-prone cells in remission is by a low-protein whole-foods plant based diet. See chapter three of the book *China Study* for much more detail on this subject.

Cardiovascular Diseases. The most pervasive killer in our modern Western culture is not cancer; it is heart disease. Heart disease is the number one killer in the

United States and kills one out of every three Americans. The profile of diseases contributing the most to disease and death in America changed significantly in the last century. Today, in the 21st century chronic diseases such as cardiovascular disease (primarily heart disease and stroke), cancer, and diabetes are among the most common, most costly, and ironically the most preventable of all health maladies. Seven out of every 10 Americans die each year (more than 1.7 million people), from a chronic disease that may have been prevented. These diseases produce tremendous suffering and debilitation worldwide. They dramatically reduce the quality of life for millions of Americans. Chronic, disabling conditions cause major limitations in activity for more than one of every 10 Americans, or 25 million people (Centers for Disease Control and Prevention, 2005). Over 60 million Americans currently suffer from some form of cardiovascular disease including high blood pressure, stroke, and heart disease. The irony is that there is a mountain of evidence from researchers all over the world confirming that heart disease can be prevented and even reversed by a healthy lifestyle and a whole foods plant-based diet. People who cannot perform the most basic exercise because of severe angina can be vastly improved and find a new life by simply changing to vegetarian diets. If America would do this, it could defeat the most dangerous disease in this country (Campbell, 2005).

Toxins

The Earth is a polluted and toxic planet (Colbert, 2001). Since the beginning of the industrial revolution, humankind has continued to pour toxic pollution into the air, water and soil. Human beings are not exempt from the effects of all these poisons. If people are

breathing them, drinking them and eating them they will become sick and in many cases die (Colbert, 2001).

Following are some of the toxin categories that can accumulate in the body and cause or at least contribute to pain, sickness and disease: Chemical toxins, food origin toxins, environmental toxins, cosmetic toxins, medication/narcotic toxin, metal toxins, injected toxins, pathogens, arthropod toxins, structural/surgical toxins, electromagnetic toxins, emotional toxins, spiritual toxins, inherited toxins (Health Care Ministry International, 2003). According to Dr. Joseph Mercola the 10 Most Common Toxins that are found in our air, water and/or food supply are:

1. PCBs (polychlorinated biphenyls) - which may cause cancer and impaired fetal brain development. One major source of PCB's is farm-raised salmon (Mercola, 2006).
2. Pesticides: The Environmental Protection Agency (EPA) reports that, 60 percent of herbicides, 90 percent of fungicides and 30 percent of insecticides are carcinogenic. Pesticide residuals have been found in 50 to 95 percent of American foods. The risks are cancer, Parkinson's disease, miscarriage, nerve damage, birth defects, blocking the absorption of food nutrients. The main sources are fruits, vegetables, commercially raised meats and bug sprays (Mercola, 2006).
3. Mold and other Fungal Toxins: An exposure to a small amount of these toxins can trigger a range of health problems such as cancer, heart disease, asthma, multiple sclerosis and diabetes. The sources are contaminated buildings, food like peanuts, wheat, corn and alcoholic beverages (Mercola, 2006).

4. **Phthalates:** These chemicals lengthen the life of fragrances and soften plastics. Risks to humans are endocrine system damage (phthalates chemically mimic hormones and are particularly dangerous to children. Major environmental sources are plastic wrap, plastic bottles, and plastic food storage containers. All of these containers can leach phthalates into food (Mercola, 2006).
5. **Volatile organic chemicals VOCs** are gasses expelled from certain solids or liquids, and they include a variety of chemicals that produce short and long-term maladies. The concentrations of many VOCs are usually higher indoors (up to ten times higher) than outdoors. The source of VOCs are from many things such as water, carpet, paints, deodorants, cleaning fluids, varnishes, cosmetics, dry cleaned clothing, moth repellants, air fresheners, and many other household items. Human risks are cancer, eye and respiratory tract irritation, headaches, dizziness, visual disorders, and memory impairment (Mercola, 2006).
6. **Dioxins:** Chemical compounds formed as a result of combustion processes such as commercial or municipal waste incineration and from burning fuels (like wood, coal or oil). Risks: Cancer, reproductive and developmental disorders, chloracne (a severe skin disease with acne-like lesions), skin rashes, skin discoloration, excessive body hair, mild liver damage. The major Sources are animal fats. Over 95 percent of exposure comes from eating commercial animal fats (Mercola, 2006).
7. **Asbestos:** a carcinogenic insulating material that was widely used from the 1950s to 1970s. The source is from insulation on floors, ceilings, water pipes and heating ducts when the material becomes old and crumbly, releasing fibers into

- the air. Human risks are cancer, scarring of the lung tissue, mesothelioma (a rare form of cancer) (Mercola, 2006).
8. Heavy Metals: Heavy metals like arsenic, mercury, lead, aluminum and cadmium that are common in many areas of our environment can accumulate in soft tissues of the human body. The human risks are cancer, neurological disorders, Alzheimer's disease, foggy head, fatigue, nausea and vomiting, decreased production of red and white blood cells, and abnormal heart rhythm (Mercola, 2006).
 9. Chloroform: This colorless liquid has a rather pleasing, nonirritating odor and a slightly sweet taste, and is used to make other chemicals. It is also formed when chlorine is added to water. The human risks are cancer, potential reproductive damage, birth defects, dizziness, fatigue, headache, liver and kidney damage. The major sources are air, drinking water and foods that can contain chloroform (Mercola, 2006).
 10. Chlorine: This highly toxic, gas is one of the most heavily used chemical agents in our modern technology. The human risks are sore throat, coughing, eye and skin irritation, rapid breathing, narrowing of the bronchi, wheezing, blue coloring of the skin, accumulation of fluid in the lungs, pain in the lung region, severe eye and skin burns, lung collapse, reactive airways dysfunction syndrome (RADS) (a type of asthma). The major sources are household cleaners, drinking water (in small amounts), and air when living near an industry (such as a paper plant) (Mercola, 2006).

On November 11, 2004, Cliff Thompson a writer for the Vail Daily reported that veteran fish biologist John Woodling decided to examine the fish inhabiting Colorado waters below Front Range sewage plant outlets. What he found shocked him and drew national media attention. He discovered that there were very few male fish in this location and the reproductive organs of both male and female fish had hermaphrodite tendencies; the same fish contained both male and female tissues. Woodling was emotionally shaken because he knew that the toxins that polluted these waters and caused the fish to mutate might indeed have long-term implications for humans and for our ecosystem. He believes the changes in these inter-sex fish were caused by a cocktail of pharmaceutical substances such as antibiotics, hormones, and steroids that humans use and pass along to the environment. He also suspects the main substance causing the sexual mutations in the fish was nonylphenyls. Nonylphenyls is a common substance found in many plastic containers that can transfer to the food and beverages they hold. They are found in just about all the food we eat and have been banned in some European countries. Humans commonly use these, and other substances called endocrine disrupter chemicals. When ingested or when organisms are exposed to them, they can and do cause harm. A very small exposure in concentrations as minute as a just a few parts per-billion can be harmful over the long term (Thompson, 2005).

Other sources in the United States and Great Britain have also reported discovering mutated and cancerous fish with the suspected cause being pollutants in the water as outlined in an article by Black (no date). These toxic pollutants in Earth's waters are suspected of causing a host of human health problems and may be just the visible tip of a huge iceberg of current and future health problems. Since 1930, more than 75,000

synthetic chemicals have been introduced into Earth's one and only life-sustaining environment. There is a potential for this number to be even larger because of individual chemicals bonding into compounds when exposed to sunlight or water. Even more alarming is the fact that only about 7% of the 75,000 have been tested for safety in adults and only about 3% for safety in children (Nugent, 2004). So, how many of these substances are loose in our environment and end up in humans? Nugent (2004) reports that a prodigious 300-500 toxins that were not in existence before 1940 can now be detected in the tissues of every North American person. He further states that many of these toxins are not confined to the United States but are indeed global. Internationally famous television journalist Bill Moyers produced a show on the relationship of toxins to disease. At the end of the same show, he allowed himself to be tested for 150 possible toxins and the resulting serum analysis revealed 84 toxins in his blood (Nugent, 2004).

Fresh and saltwater fish have been tested in many waterways around the world and all have been found to contain pesticides and industrial toxins. Studies have been done at very remote places like the North Pole and virtually every known toxin and farm pesticide was found there. Scientists drilled into the ice near the North Pole and found nearly a foot of industrial looking, brown and green liquid that refused to freeze. Contained in this slop were hundreds of chemicals including dichloro-diphenyl-trichloroethane, (DDT), dioxin, and Polychlorinated-biphenyl (PCB's). Scientists have also gone to the South Pole and found farm pesticides and industrial chemicals in the fatty tissues of penguins. The fact that all these toxins have been found in such desolate and uninhabited locations proves that humans live in a closed eco-system and the entire planet is exposed to toxins (Nugent, 2004).

Dichloro-diphenyl-trichloroethane (DDT) is one of the dangerous, synthetic, environmental toxins that mimics estrogen and disrupts hormones in the human body (Smith, n.d.). Indication of its harmful effects goes back to 1950 when two Syracuse University biologists gave experimental injections of DDT to baby roosters. The roosters grew up looking like hens. Fortunately, it is now illegal to use DDT in the United States; however, the United States still produces DDT and then exports it to third world countries (Smith, n.d.) The result of this action is that it not only damages health in other countries but the American public actually ends up consuming DDT on produce when it is imported back from those same third world countries. Dichloro-diphenyl-trichloroethane is stored in the fat, notably the breast fat that makes it exceptionally dangerous for women to ingest this toxin. The breast fat may concentrate a form of DDT (DDE) up to 700 times than that of the blood, which puts women at exceptional risk for cancer from this toxin

Medical research has confirmed that certain chemicals that pollute our environment can mimic estrogen and thereby disrupt hormonal processes in humans and animals (Smith, n.d.). These chemicals can come from sources previously thought inert such as plastics that might be used to package food and detergents. Some species of the animal kingdom are also being affected by environmental toxins and showing evidence of hormone disruption. Estrogen mimicking chemicals can also act synergistically to amplify each other or even block each other. Chemicals in the environment that have estrogenic effects, known as xenoestrogens, are now being investigated by the Environmental Protection Agency. These chemicals are the prime suspects in causing premature menstruation (approximately age 10) in the United States. The age of

menarche used to be 16. Authorities have insisted that this is normal for a population with good nutrition. Herman-Giddons (1997) in a landmark study published in *Pediatrics* showed that out of 17,000 girls, 15% aged 8 years old began to show signs of puberty in the United States. Scientists are now realizing that hormones that disrupt estrogen are not the whole story. These chemical disrupters may influence other human hormones as well (Smith, n.d.).

Another example of the effects of environmental pollution on humans is a terrible disease known as Amyotrophic Lateral Sclerosis (ALS or Lou Gehrig's disease). The writer is acquainted with this disease because he had the misfortune of watching, over the course of seven years, one of his relatives (a giant of a man both academically and spiritually) deteriorate, diminish, and finally die from this rapacious, unrelenting malady. It has now been reported that the majority of these ALS cases do not appear to be genetic, but rather have (primarily) environmentally related causes (Windham, n.d.).

Still another terrible example of the effects of environmental pollution is the rate of cancer in children, which has grown 1% annually since 1970, as reported in a study from the National Institute of Environmental Health Sciences. With most of these cases occurring in the first year of life, Leslie L. Robison of the department of pediatrics at the University of Minnesota declares "it is quite obvious these cancers are caused by something that happened prior to birth" (Wikipedia contributors, 2006). These 'something's are environmental toxins. Since the discovery that the placental barrier is not the magic protector of children it was once thought to be, evidence has been slowly mounting to mark the significance of the surroundings on the growing fetus. Classic cases, which presented clear causal relationships between child birth defects and the

maternal environment, include the effects of diethylstilbestrol, thalidomide and congenital rubella syndrome. The first catastrophe to induce the examination of toxins specifically was the well-known Miramata disease (Wikipedia contributors 2006).

Prions are a (relatively) newly discovered disease-causing protein (food toxin). Some have denied the existence of prions in the past but recent research studies indicate they are real and do cause real diseases. They are in a non-conventional form that has not been known in the past to cause disease. They are not viruses, bacteria, fungi, or parasites. They are simply proteins, and proteins (up until now) were never thought to be infectious on their own. The scientific theory has been that organisms are infectious and proteins are not. For decades, however, scientists searched for unusual, atypical infectious agents that they suspected caused puzzling diseases that could not be linked to any of the regular infectious organisms. Now researchers are starting to accept the fact that proteins can be and are infectious. More than one protein chemist has rejected this theory in the past yet this is precisely what is implied by a growing number of studies (Guyer, n.d). Prions became publicly known during the mad cow epidemic in England in 1986. Prion diseases have both infectious and hereditary traits. The gene that provides the code for prions can mutate and be passed on to the next generation. Most of the prion diseases can be acquired directly by infection, but unlike other infectious agents, prions do not initiate an immune response. An epidemic of Bovine Spongiform Encephalopathy (BSE) in England in 1986 which infected some 178,000 cows was directly linked to a protein feed supplement that contained rendered remains of scrapie-infected sheep brains (www.Encyclopedia.com, no date). This is especially alarming for Americans because up until 1997 it was legal and common practice to include rendered (“glue factory”) animal

protein products in cattle feed. In the wake of the mad cow epidemic and after years of delay the United States Food and Drug Administration finally put a ban on feeding ruminant animals certain (but not all) proteins from ruminant animals. However, blood products, milk products and gelatin from rendered ruminants and protein from rendered pigs and horses are still legal. Most Americans would never consider eating meat from rendered animals yet we eat meat that is produced by feed that contains protein from rendered and very possibly diseased sources. This is exactly what caused the epidemic in England (Nedley, 1999). In 1996, a suspicion that BSE had been transmitted to humans who died of a variant of Creutzfeldt Jakob Disease (vCJD) in England caused a scientific and economic frenzy and the European Union imposed a ban (1996-99) on the export of British beef. Instances of BSE in cattle have also occurred in many other European countries, as well as Canada, and the United States, but the vast majority of cases occurred in Britain in the 1980s. There is now compelling evidence that BSE is the same disease as variant CJD (vCJD), which has killed more than 130 people (www.Encyclopedia.com, no date).

The foregoing are only a selected few examples of a long list of environmental pollution problems that have biologists, government officials, and conservationists very concerned for the future of the human race and for planet Earth. If we continue to pump pollutants into the air, water, and soil at the current rate, our children and future generations will have a terrible price to pay (Nugent, 2004).

However, the current situation for humans is not hopeless. There are ways to rid the body of years of accumulated toxins and their effects and minimize future exposure to environmental toxins (Colbert, 2001). For example:

1. Fasting (Colbert, 2001)
2. Drinking generous amounts of pure water (Colbert, 2001).
3. Eating generous amounts of fresh, organic, cruciferous, fibrous vegetables (Nedley, 1999)
4. Eating generous amounts of fibrous whole grains, seeds and fruits (Nedley, 1999).
5. Eating garlic and onions (Colbert, 2001).
6. Using detoxifying herbs and herb teas (Colbert, 2001).
7. Changing to a whole food plant-based diet and minimize unhealthy foods (Campbell, 2005).
8. Various supplements such as vitamins, minerals, antioxidants, bioflavonoids, and lipotropics (Colbert, 2001).
9. Rather than eating significant amounts of fish, which is contaminated with PCBs and mercury, ingest a high-quality purified fish or cod liver oil.
10. Avoid processed foods, which are usually processed with chemicals (Mercola, 2006).
11. As much as possible, use natural cleaning products in your home and work environment (Mercola, 2006).
12. Use natural brands of toiletries, such as shampoos, toothpastes, antiperspirants and cosmetics (Mercola, 2006).
13. Have a competent biological dentist remove metal/mercury fillings taking care to minimize the risk of further mercury exposure (Mercola, 2006).

14. Avoid the use of artificial air fresheners, dryer sheets, fabric softeners or other synthetic fragrances as they can pollute the air you are breathing (Mercola, 2006).
15. Avoid all artificial food additives, including artificial sweeteners and MSG (Mercola, 2006).
16. Obtain plenty of safe sun exposure to strengthen your vitamin D levels and your immune system (Mercola, 2006).
17. Test your tap water and if contaminants are present, install an appropriate water filtering system that will filter your entire fresh water system (Mercola, 2006).
18. Limit the use of pharmaceuticals (prescription and over-the-counter) as much as possible. They will leave residues and accumulate in your body over time (Mercola, 2006).
19. Continue to research your environment and do everything feasible to minimize exposure to air, water, soil, surface, food, pharmaceutical, and cosmetic toxins (Nugent, 2004).

Chapter III: Summary, Critical Analysis, and Recommendations

This chapter will summarize research findings from the previous chapter as well as provide a critical analysis of information on the effects of lifestyles on human health. It will conclude with recommendations for further research on several health topics.

Summary

There is a definite relationship between lifestyles and health. Proper eating habits, healthy lifestyles and minimizing exposure to toxins can actually improve health and save lives (Campbell, 2005). They do this by reducing cancer, heart disease, strokes, obesity, diabetes, autoimmune diseases, osteoporosis, Alzheimer's, kidney stones, asthma, blindness and many other maladies. Simply by choosing wholesome foods we can reduce body weight, help to prevent or reverse diabetes, cancer and heart disease. Our diet has the potential to make a big difference in our health. In addition, a wholesome diet can strengthen the immune system to produce increased resistance to toxins, viruses, bacteria, and assuage many ailments such as arthritis, allergies, asthma, and hypertension. It is evident from information presented in this paper that modern man needs to make some radical lifestyle changes in order to regain strength, superior intellect and vitality. These changes need to be made as soon as possible to ensure the health and vigor of future generations (Campbell, 2005).

While studying the history of diet and disease in some of England's most famous libraries, Dr. Colin Campbell discovered some amazing information. He discovered that humankind has had access to the truth for a long time, even millennia, about the health and life inducing properties of a vegetarian diet and the destructive deadly properties of a meat diet. He found famous authors such as Seneca, and even Hippocrates, the father of

Western medicine, reporting that diet and lifestyles are directly related to health and disease. In fact, well over 2000 years ago the great Greek philosopher Plato advocated a vegetarian diet and warned that eating meat results in bad health (Campbell, 2005). One of the great inventors and thinkers in American history, Thomas A. Edison, said over 100 years ago “The doctor of the future will not give medicine, but will interest and instruct his patients in the care of the human frame, in diet and in the cause and prevention of disease (Beals, 1996).

We have fumbled around for the past 2,500 years, building up the unsustainable behemoth that we now call modern society. We certainly won't have another 2,500 years to remember the teachings of Plato, Pythagoras, Seneca and Macilwain; we won't even have 250 years. (Campbell, 2005, p. 348)

The information above is not presented in this paper as a polemic on our capitalistic system or modern technology but as an admission of the personal plight of the writer along with most of the Western world. Hopefully, through education we can understand the real issues and begin to fix the problems.

Research Conclusions

Nutrition and Diet

The findings listed below demonstrate that a good diet is an extremely powerful weapon against disease and sickness. An understanding of this scientific evidence is not only important to improve health, but it also has profound implications for our entire race (Campbell, 2005). The following is a list of pertinent conclusions from this paper on the benefits of a wholesome diet:

1. The things we put into our bodies (diet) and the things we do with our bodies largely determines our lifespan and state of health. The sum total of all the choices we make in these two areas is known as our lifestyle (Nedley, 1999).
2. Heart disease can often be arrested and even reversed by diet alone (Esselstyn, Ellis, Mendendorp, et al, 1995).
3. Research indicates that the development of cancer in the human body can often be prevented, arrested, and even reversed with dietary and lifestyle changes (Campbell, 2005).
4. Research indicates that stringent diet changes may enable many diabetic patients to go off their medication. Progression to diabetes among those with pre-diabetes is not predestined. Research indicates that weight loss and increased physical activity among people with pre-diabetes prevents or delays diabetes and may return blood glucose levels to normal (Nedley, 1999).
5. Specifically, consuming animal products, including dairy foods, can increase the risk of ingesting prions that cause devastating transmissible spongiform encephalopathy's such as Mad Cow Disease and Creutzfeldt-Jakob Disease (CJD) (Nedley, 1999).
6. Anti-oxidants, found in fruits and vegetables are linked to a stronger immune system, better overall health and better mental performance in old age (Nedley, 1999).
7. Type 1 diabetes is one of the most devastating diseases that can befall a child and is linked to infant feeding practices. There is convincing evidence that feeding cow's milk to babies does cause Type 1 diabetes in some children (Nedley, 1999).

8. Misinformation about diet and health dominates our society because we are grossly mistaken on how we investigate the relationship between diet and disease. This leads to an erroneous definition of wellness, and a false understanding of how we should prevent and treat illness (Campbell, 2005).
9. With all the misinformation and disagreement over diet and health, some people are beginning to sense the need for change, and beginning to question some of the most basic assumptions that we have about food and health (Campbell, 2005).
10. Some people are beginning to understand the conclusions of scientific literature and are changing their lives for the better. Never before has there been such a mountain of empirical research supporting a whole food, plant-based diet; a diet that can actually reverse heart disease (Campbell, 2005).

Disease and Toxins

Following are some research conclusions about disease and toxins.

1. Toxic chemicals in the environment and in food are very damaging but may be secondary to personal lifestyles as the main cause of cancer in the Western world (Campbell, 2005).
2. The genes inherited from parents are not the real causes of the top ten reasons for human mortality. The hope that genetic research will eventually lead to drug cures for diseases ignores the simpler, more effective solution of changing one's lifestyle and diet (Campbell, 2005).
3. The constitutional (holistic) nature of disease concept means that disease is not the result of one cell, one organ or one chemical reaction gone awry. It is not the result of one external cause acting independently. It is in fact the

result of multiple systems throughout the body breaking down. Human health cannot be fragmented into separate, convenient, isolated treatment grids but must be considered as a whole interconnected system (Campbell, 2005).

4. Obsessively controlling intake of any one nutrient such as carbohydrates, fat, cholesterol, or omega-3 fats will not result in long-term health (Campbell, 2005).
5. Vitamins and nutrient supplements apart from a holistic lifestyle/diet do not give long-term protection against disease (Campbell, 2005).
6. The vast majority of doctors do not know what people need to eat to achieve optimum health because doctors are grossly under-trained in nutrition during their formal education (Campbell, 2005).
7. Drugs and surgery do not usually cure the diseases that kill most Americans; in fact, properly prescribed medical care is the third leading cause of death in the United States (Campbell, 2005).
8. There are no pills or procedures that effectively prevent, eliminate, or even treat the real causes of many chronic diseases. In reality, the most promising preventions and treatments have now been shown to be diet and lifestyle changes. This includes a wholesome diet, and minimizing exposure to and counteracting the effects of environmental toxins. (Campbell, 2005).
9. Despite our government's attempts to persuade us otherwise, there is now overwhelming scientific evidence that eating animal products is very

dangerous because of all the chemical toxins, contaminants, and disease-causing substances they contain (Nedley, 1999).

10. Animal protein raises blood cholesterol levels in humans. International comparisons between countries show that populations subsisting on traditional plant-based diets have far less heart disease (Campbell, 2005).
11. Never before have we had such a depth of understanding of how diet affects cancer on both a cellular level as well as a population level. Published data shows that animal protein promotes the growth of tumors (Campbell, 2005).
12. Animal protein also increases the levels of a hormone, IGF-1, which is a risk factor for cancer. In addition, high casein, which is the main protein of cow's milk, allows more carcinogens into cells, which allow more dangerous carcinogen products to bind to DNA, which allow more mutagenic reactions that give rise to cancer cells, which allow more rapid growth of tumors once they are initially formed (Campbell, 2005).
13. Data shows that a diet based on animal foods increases females' production of reproductive hormones over her lifetime, which may actually lead to breast cancer (Campbell, 2005).
14. There is now convincing evidence showing that a whole-food, plant-based diet is best for preventing cancer. Specifically research indicates that Cancer may be arrested or even reversed with a low protein diet. Dr. Campbell's research showed that humans could live adequately on as low as 5% protein, with 7% plant-based protein being optimal for preventing and even reversing disease. In addition, his research indicated that, an intake of

protein above 10% significantly increases the risk for disease (Campbell, 2005)

15. Our technology now allows us to measure the biomarkers associated with diabetes, and the evidence to show that blood sugar, blood cholesterol, and insulin levels improve more with a whole-food, plant-based diet than with any other treatment (Campbell, 2005). This diet may reverse the disease and allow medications to be terminated (Campbell, 2005).
16. A broad range of international studies show that Type 1 diabetes, a serious autoimmune disease, is related to cow's milk consumption, and premature weaning of babies. We now know that the autoimmune system can attack one's own body through a process of molecular mimicry, which is induced by undigested animal proteins that find their way into the blood stream (Campbell, 2005).
17. There is some evidence linking multiple sclerosis with animal food consumption, especially dairy product consumption. Dietary intervention studies have shown that a healthy diet can help slow and perhaps even halt, multiple sclerosis (Campbell, 2005).
18. There is also evidence that diets containing excess animal protein can cause kidney stones because of excessive calcium and oxalate and may eventually destroy kidneys and cause many other maladies as well (Campbell, 2005).
19. We now know that fruits and vegetables containing large amounts of anti-oxidants may prevent cataracts and age-related macular degeneration (Campbell, 2005).

20. Research has shown that cognitive dysfunction, vascular dementia caused by small strokes, and Alzheimer's are all related to diet (Campbell, 2005).
21. Investigations of human populations show that risk of hip fracture and osteoporosis is increased by animal-based diets. This is because animal protein actually leeches calcium from the bones by creating an acidic environment in the blood (Nedley, 1999).

The secret to good food and good health is very simple and can be cited in one sentence: Convert to a whole food, plant-based diet, while minimizing the consumption of refined foods, added salt, added sugar and added fats (Campbell, 2005).

Writer's General Recommendations to Improve Health and the Quality of Life

1. Purchase and study the books entitled *The China Study* (Campbell, 2005), *Proof Positive* (Nedley, 1999), *How to Survive on a Toxic Planet* (Nugent, 2004) and *Toxic Relief* (Colbert, 2001). They contain recipes for longevity and holistic health and offer hope to millions who are suffering from toxic exposure and disease.
2. Minimize personal and family exposure to toxins and take measures to counteract environmental, pharmaceutical, and natural body toxins as much as possible. Toxins are much more to blame for disease than genetics. For specifics, please see: *How to Survive on a Toxic Planet* (Nugent, 2004) and *Toxic Relief* (Colbert, 2001).
3. As much as possible, eliminate all unsafe and unhealthy acts and activities such as smoking, alcohol and drug abuse or other things that are injurious, or potentially injurious to human health (Nedley, 1999).

4. “To keep the body functioning properly, it is essential to drink at least eight, 8 ounce glasses of good quality water each day” (Balch & Balch, 1997, p. 30).
5. Adopt a whole-foods plant based diet and give your digestive system time to rest between meals and at night (Nedley, 1999).
6. Decrease or even eliminate unhealthy refined and processed foods that contain excess fat, sugar and chemicals but are deficient in nutrients (Campbell, 2005).
7. Practice regular aerobic exercise, and obtain adequate amounts of rest and sleep (Webb, 2003).
8. Maintain proper body weight (Belloc & Breslow, 1972).
9. Research and work with your health care professional to identify and initiate a regimen of taking high quality food supplements that contain the essential nutrients that are missing in modern diets. These supplements should be of a high quality and based on valid nutritional science. Their design must consider such things as potency, stability and body chemical interactions (Nugent, 2004).
10. Reduce overall stress in your life as much as possible and protect yourself by acting safely and responsibly (Colbert, 2001).
11. Take time for yourself to enjoy life, family and friends and hobbies, i.e.: re-creation, not wreck-creation (Nedley, 1999).
12. Develop the spiritual aspect of your life and consider seeking a higher purpose in life by loving and serving the creator and his creation (Nedley, 1999).

Critical Analysis

Research on nutrition and disease can be very confusing because there are many political, financial, and medical agendas to be served for the huge industries that are

associated with food and health care in this country and the world. This situation naturally produces a lot of propaganda, embellishment and prevarication on this subject. In a society of huge corporations, it is sometimes very hard to obtain the real and complete truth of large surveys and studies without biasing influences.

Campbell (2005) Nedley (1999), Nugent (2004), Webb (2003), Plog (2003) and several other authors cited in this paper believe that a natural lifestyle with its inherent low stress, wholesome natural food and minimal exposure to toxins is the only path of survival for the human race. However, their views are somewhat idealistic because this world may have already reached a place where it is impossible for every person to have low stress, a pure environment, and all natural food, even if the entire world population collectively decided to try to achieve it. Humanity would have to make some drastic changes immediately to even partially recreate such a pristine world. The world is now deeply entrenched in industrialization, and commercialization and suffering the consequences of global pollution. It may never be able to get out of this unhealthy rut because of the ever-increasing world population coupled with people's reluctance to change. Eating synthetic food, taking synthetic supplements, and breathing city pollution may be the only choice in the future if the Western world does not change its destructive philosophies concerning lifestyles, health and ecology.

Nutrient-complete, organic farming, both small and large scale is very possible and could supply much of the world with relatively low-toxin, nutritious food. Likewise, the industrial nations of the world could work together to halt and reverse global pollution. However, it would take major sacrifices and changes in societal philosophies to accomplish this. It is not likely this will occur because of the magnitude and momentum

of capitalism in our modern world. However, the writer of this paper still believes the alarm should be sounded that the world must try to change for the better, and very soon because time is running out.

Recommendations

A recommendation for further research would be to have reliable studies completed on the long-term effects of prions, toxins, pharmaceuticals, and commercial/processed food on human health. Along with this would be research on how to feed populations with a vegetarian diet, and how to maximize crop yields in organic farming on minimal acreage. Another recommendation would be to research the effects of, and countermeasures to, free radicals and oxidative stress on human health. Yet another recommendation would be to research the methods of reinstating essential missing nutrients back into soil used for food production. Another very important subject needing further research is the field of Glycoscience (or Glycobiology). It is a relatively new field of study that has tremendous potential for improving human health and is currently being studied by several famous universities in the United States and Europe. GlycoScience is cutting-edge technology founded upon the very latest biological research. I strongly urge the reader to do further research on this topic.

Last, but not least, research is needed on curriculums and teaching methods that will more effectively teach those children and adults that have already been affected by toxins, and or the poor lifestyle choices of their parents. Not only do they need special understanding and education, but also they and their caregivers, need to realize the effects of modern lifestyles and toxins on human health in order to start to improve their quality of life.

References

- American Cancer Society Contributors. (2006) *Cancer statistics 2006*. Retrieved March 30, 2006 from [http://www.cancer.org/downloads/STT/Cancer_Statistics_2006_Presentation.ppt#256,1,Cancer Statistics 2006](http://www.cancer.org/downloads/STT/Cancer_Statistics_2006_Presentation.ppt#256,1,Cancer_Statistics_2006)
- American Diabetes Association fact sheet*. (no date). Retrieved December, 2005 from <http://www.diabetes.org/diabetes-statistics/national-diabetes-fact-sheet.jsp>.
- Balch, J., & Balch, P. (1997). *Prescription for nutritional healing* (2nd ed.). Garden City Park, NY: Avery Publishing Group.
- Beals, G. (1996). *Thomas Edison quotes*. Retrieved May 18, 2006 from <http://www.thomasedison.com/edquote.htm>
- Belloc, N. B., & Breslow, L. (1972). Relationship of physical health status and health practices. *Prev Med*, 1(3), 409-421.
- Black, J. J. (no date). *Gross signs of tumors in Great Lakes fish: A manual for field biologists*. Retrieved March 5, 2006 from <http://www.glfsc.org/tumor/tumor1.htm>.
- Brown, J. (1999). *Nutrition now*. Belmont, CA: Wadsworth Publishing Company.
- Brown, P., & Liberski, P. P. (1990). Resistance of scrapie infectivity to steam autoclaving after formaldehyde fixation and limited survival after washing at 360 degrees C: Practical and theoretical implications. *Journal of Infectious Diseases*, 161(3):467-472.
- Campbell, C. (2005). *The China study: The most comprehensive study of nutrition ever conducted and startling implications for diet, weight loss, and long-term health*. Dallas, TX: Benbella Books.

- Centers for Disease Control and Prevention Contributors. (2005). *Chronic disease overview*. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. Retrieved May 2, 2006 from <http://www.cdc.gov/nccdphp/overview.htm>
- Colbert, D. (2001). *Toxic relief*. Lake Mary, FL: Siloam Press, A part of Strang Communications Company.
- Committee on Nutrition in Medical Education. (1985). *Nutrition education in US medical schools*. Washington, DC: National Academy of Sciences.
- Dubouch, G. (2003). *Science or miracle? The metabolic glyconutritional discovery*. Talent, OR: InnerLife Foundation.
- Elkins, R. (2002). *Miracle sugars: The new class of missing nutrients*. Pleasant Grove, UT: Woodland Publishing.
- Environmental toxins and fetal development*. (2006). Retrieved May 1, 2006 from http://en.wikipedia.org/wiki/Environmental_toxins_and_fetal_development
- Esselstyn, C. B., Ellis, S. G., Mendendorp, S. V., _et al. (1995). A strategy to arrest coronary artery disease: A five year longitudinal study of a single physicians practice. *Journal of Family Practice*, 41, 560-568. As cited in Campbell, C. (2005) *A China study*.
- Food standards contributors. (2004). *Dioxins in food: Questions and answers*. Retrieved April 19, 2006 from <http://www.foodstandards.gov.au/mediareleasespublications/factsheets/factsheets2004/dioxinsinfoodquestio2458.cfm>

- Guyer, R L. (2006). *Prions: Puzzling infectious proteins*. Retrieved April 2006 from <http://science-education.nih.gov/home2.nsf/Educational+ResourcesResource+FormatsOnline+Resources+High+School/D07612181A4E785B85256CCD0064857B>.
- Health Canada Contributors (2006). *Dietary reference intakes tables health Canada*. Retrieved April 24, 2006, from http://www.hc-sc.gc.ca/fn-an/nutrition/reference/table/index_e.html
- Health Care Ministry International. (2003). *Most common toxic categories*. Retrieved March 4, 2006 from http://www.hcmionline.com/gsw/toxin_categories.htm.
- Health Insurance Association of America. (no date). *Sourcebook of Health Insurance Data: 1999-2000*.
- Hellmich, N. (2004). *School vending rated as junk by USA today health and behavior*. Retrieved May 5, 2006 from http://www.usatoday.com/news/health/2004-05-11-vending-machines_x.htm
- Hildenbrand, G. L., Hildenbrand, L. C., Bradford, K., et al. (1995). Five-year survival rates of melanoma patients treated by diet therapy after the manner Gerson: A retrospective review. *Alternative Therapies in Health and Medicine* 1, 29-37.
- Hoffers, A. (1999). *ABC of natural nutrition for children*. Kingston, ON: Quarry Press.
- Kilata, G. (2003). Vitamins: More may be too many. (sciences section). *The New York Times*, April 29, 2003: 1, 6.
- Kozol, J. (2000). *Ordinary resurrections*. New York, NY: Crown Publishers.

Life Extension Magazine Contributors. (2001, March) Vegetables without vitamins. *Life Extension Magazine*. Retrieved April 30, 2006 from

http://www.lef.org/magazine/mag2001/mar2001_report_vegetables.html.

Margen, S. (1992). *The wellness encyclopedia of nutrition*. New York, NY: Rebus.

Matsen, J. (1987). *Eating alive: Prevention thru good digestion*. Vancouver, Canada: Crompton Books.

McAnalley, B., Dykman, R., Dykman, K., & Hall, J. (2002, July). An interpretation of the effects of a single dose of a glyconutritional supplement on the brain function of healthy college students, including a review of brainwave function.

GlycoScience & Nutrition, 3(4). Retrieved October 18, 2004, from

http://www.usa.glycoscience.com/glycoscience/start_frames.wm?FILENAME=C

011

McDougall, J. (2002). *The great debate: High vs. low protein diets, meat free zone articles - health & nutrition*. Retrieved May 1, 2006 from <http://www.all-creatures.org/mfz/health-highprotein2.html>.

Mercola, J. (2006). *How to avoid the top 10 most common toxins*. Retrieved May 2, 2006 from http://www.mercola.com/2005/feb/19/common_toxins.htm.

Meyer-Duntley, S. (no date). *Asthma, is it becoming epidemic? The rate for children under 5 has increased 160% the past 15 years*. Retrieved May 2, 2006 from, http://cnyhealth.com/?event=Article_View&articleNum=939

Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States – 2000. *Journal of American Medical Association*. *Special Communication* March 10, 2004 –291(10).

- Nedley, N. (1999). *Proof positive: How to reliably combat disease and achieve optimal health through nutrition and lifestyle*. Ardmore, OK: Self Published
- Nugent, S. (2004). *How to survive on a toxic planet*. The Alethia Corporation.
- Nutrition education in U.S. medical schools*. (1985). Committee on Nutrition in Medical Education. Washington, DC: National Academy of Sciences.
- Omelchuk, A., & Wells, D. (2004, March). Preliminary investigation into the benefits of glyconutrient supplementation in learning-disabled children. Proceedings of the *Fisher Institute for Medical Research*, 3(2), 16-17 (Journal available from <http://www.fisherinstitute.org>)
- Ornish, D. (2003). *The heart healthy lifestyle program*. Retrieved from <http://www.webmd.com/content/article/61/67423> (WebMD Live Events Transcript).
- Ornish, D., Brown, S. E., & Scherwitz, L. W. (1990). Can lifestyle changes reverse coronary heart disease? *Lancet*, 336, 129-133.
- Plog, S. (2003). *Excalibur*. Houston, TX: Result Publishing Company.
- Rhodes, C. J., (ed.). (2000). *Toxicology of the human environment: The critical role of free radicals*. New York, NY: Taylor and Francis Incorporated.
- Robinson, L. L. (2003). Children's health. *Chemical & Engineering News*, April 7, 2003, p. 23-26.
- Rocchini, A. P. (2002). Childhood obesity and a diabetes epidemic. *New England Journal of Medicine*, 346(11), 854-855.

- Saad, N. (2004) *Aflatoxins: Occurrence and health risks*. Retrieved November 19, 2004 from, <http://www.ansci.cornell.edu/plants/toxicagents/aflatoxin/aflatoxin.html>.
- Saccharide. (n.d.) *The Columbia Electronic Encyclopedia®*. (2005). Retrieved May 18 2006 from <http://columbia.thefreedictionary.com/saccharide+>
- Smith, E. (no date). *The cause of uterine fibroid tumors: How to avoid the cause of uterine fibroid tumors (myomas)*. Retrieved December 2005 from, <http://www.fibroid101.com/cause.htm>.
- Thompson, C. (2004). *Mutant fish found in Colorado rivers*. Retrieved December 8, 2005 from <http://www.vaildaily.com/article/20041111/NEWS/111110013/0/ARCHIVES>
- Turnbull, R., Turnbull, A., Shank, M., Smith, S., & Leal, D. (2002) *Exceptional lives: Special education in today's schools*. Upper Saddle River, NJ: Merrill Prentice Hall.
- Waehner, P. (2006). *The truth about low-carb diets*. Retrieved April 20, 2006 from <http://exercise.about.com/cs/nutrition/a/lowcarb.htm>
- Webb, N. (2003). *The cost of being sick: A prevention initiative*. Orem, UT: Sound Concepts, Inc.
- Webster's new twentieth century dictionary*. (1983). (2nd ed.) New York, NY: Simon & Schuster, a Division of Gulf & Western Corporation.
- White, E. G. (1905). *The ministry of healing*. Boise, ID: Pacific Press Publishing Association.

Wikipedia Contributors. (2005). Glycomics. *Wikipedia, The Free Encyclopedia*.

Retrieved December 18, 2005 from

<http://en.wikipedia.org/w/index.php?title=Glycomics&oldid=33250439>.

Wikipedia Contributors (2005). Lifestyle. *Wikipedia, The Free Encyclopedia*. Retrieved

20:00, December 16, 2005 from

<http://en.wikipedia.org/w/index.php?title=Lifestyle&oldid=49732557>.

Wikipedia Contributors (2005). Trans fat. *Wikipedia, The Free Encyclopedia*. Retrieved

10:40, December 18, 2005 from

http://en.wikipedia.org/w/index.php?title=Trans_fat&oldid=51961227.

Wikipedia Contributors. (2006). Environmental toxins and fetal development. *Wikipedia,*

The Free Encyclopedia. Retrieved 00:08, May 1, 2006 from

http://en.wikipedia.org/w/index.php?title=Environmental_toxins_and_fetal_development&oldid=43377822.

Wikipedia Contributors. (2006). Holism. *Wikipedia, The Free Encyclopedia*. Retrieved

19:56, May 18, 2006 from

<http://en.wikipedia.org/w/index.php?title=Holism&oldid=53717235>.

Wikipedia Contributors. (2006). Oxidative stress. *Wikipedia, The Free Encyclopedia*.

Retrieved 20:07, May 18, 2006 from

http://en.wikipedia.org/w/index.php?title=Oxidative_stress&oldid=51577851.

Wikipedia Contributors (2006). Radical (chemistry). *Wikipedia, The Free Encyclopedia*.

Retrieved 19:42, May 18, 2006 from

http://en.wikipedia.org/w/index.php?title=Radical_%28chemistry%29&oldid=53894891.

Wikipedia Contributors. (2006). Toxin. *Wikipedia, The Free Encyclopedia*. Retrieved 20:22, May 18, 2006 from

<http://en.wikipedia.org/w/index.php?title=Toxin&oldid=51048954>.

Wikipedia Contributors. (2006) Water. *Wikipedia the Free Encyclopedia*, Retrieved 09:25, April 20, 2006 from

<http://en.wikipedia.org/w/index.php?title=water&oldid=53702817>

Windham, B. (no date). *Amyotrophic lateral sclerosis (ALS): The mercury connection*. Retrieved from (<http://www.home.earthlink.net/~berniew1/als.html>). .

Woodwell, D. A., Cherry, D. K. *Physician office visit data, excerpted from: National Medical Ambulatory Care Survey 2002 Summary Advance Data from Vital & Health Statistics*, Number 346 August 26, 2004. Retrieved and Cited April 19, 2006 from <http://www.cdc.gov/nchs/about/major/ahcd/officevisitcharts.htm>.