

Plant-Based Diets: A solution to our public health crisis



A plant-based diet in conjunction with cholesterol-reducing medication eliminated progression of coronary artery disease over a 12-year period in patients with triple-vessel disease.

Esselstyn C B Jr, American Journal of Cardiology August 1999

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Front Cover Photo: Ex US President Bill Clinton who followed the dietary research of doctors Caldwell B Esselstyn, Dean Ornish and T Colin Campbell to reverse his cardiovascular disease through adopting a plant-based diet

Kerry McCarthy MP
Shadow Economic Secretary

Foreword



There are of course plenty of arguments other than health reasons for giving up eating meat and, in my case, dairy products too. I've been vegetarian since 1981, and vegan since 1992.

In my case both decisions were on ethical grounds. Since then the environmental case for at least significantly reducing, if not cutting out meat consumption altogether has gained attention and credibility. Friends of the Earth's excellent Fix the Food Chain campaign, for example, powerfully highlighted the link between the rise in meat consumption and deforestation, global food shortages and destruction of indigenous people's livelihoods. The problems caused by overfishing in our oceans were also highlighted in the brilliant film, *The End of the Line*, and, more recently, by Hugh Fearnley-Whittingstall's *Fish Fight* series.

But although I didn't become vegetarian on health grounds, I think there's a very valid case for doing so. There are well-documented links between high consumption of red meat, and processed meats in particular, and certain cancers. Studies have also linked the adoption of a Western diet in countries like Japan with rising breast cancer rates, the theory being that this is the result of increased con-

sumption of dairy products. Of course these studies are sometimes challenged but on balance I think the research out there making the health case for a diet low in meat and dairy consumption is compelling and authoritative.

The increasing industrialisation and intensification of farming has seen the adoption of farming and food-processing methods, which are enough to give anyone cause for concern: feeding animals things that are completely alien to their natural diets, pumping them full of hormones, and injecting the finished products with all manner of additives and preservatives, including brine and lean meat emulsions derived from other types of meat. I've seen horrific film footage of fish, deformed by chemicals and pollution in our seas, with huge tumours growing out of their sides. The BSE and CJD scandals were a wake-up call, but perhaps only a temporary one. Whilst there has been a shift by some towards organic farming and buying organic food, this still only represents a tiny part of the market.

Some people question whether it's possible to be vegan and healthy. They say you can't possibly get all the nutrients you need on a plant-based diet. That's simply not true – although an MP's lifestyle makes it more challenging for me than for most. Despite this there are now three vegan MPs and many more who are either vegetarian or getting there; I hope some others will consider giving it a try.



Introduction

The recent White Paper, *Healthy Lives, Healthy People* calls for a "radical shift" in the way public health challenges are tackled, stating that lifestyle-driven health problems are now at alarming levels. Statistics reveal that diet-related health costs are rising rapidly: the NHS spends £9 billion a year treating diabetes and £4.2 billion a year on obesity-related conditions, while the cost of new medicines grows by more than £600 million annually.¹ The country faces a national crisis in public health.

In the face of growing population and rising rates of chronic disease, the challenge is to improve public health whilst at the same time reducing healthcare costs, to save billions of pounds.

A solution already exists, once the direct link between dietary choices and the major chronic diseases – obesity, diabetes, heart disease – is recognized. Heart disease, the UK's biggest killer,² is a predominantly diet-caused illness³ while obesity and type II diabetes are also largely diseases of nutrition and therefore preventable.^{4,5} Impressive results, including the complete reversal of the conditions, have been achieved through the adoption of plant-based diets.

The UK is currently the most obese nation in Europe, with the Government-commissioned Foresight report predicting that if no action is taken, 60% of men, 50% of women and 25% of children will be obese within the next four decades.⁶ This would in turn lead to a further increase in related chronic diseases.

A focus on preventing disease and illness rather than treating the symptoms would offer manifold benefits. There is much value in

considering proven nutrition science on the benefits of a wholesome plant-based diet, thus avoiding the rising demand and higher costs of treatments. Merely promoting the intake of more fruit and vegetables is not sufficiently clear advice. Recommending or promoting a wholly vegan or vegetarian lifestyle as a preventative measure and a proven solution to preventing and reversing chronic disease offers the NHS, our economy and public health a win-win solution.

**American Dietetic Association –
The world's largest organisation
of food and nutrition professionals**

"It is the position of the American Dietetic Association that appropriately planned vegetarian diets, including total vegetarian or vegan diets, are healthful, nutritionally adequate and may provide health benefits in the prevention and treatment of certain diseases. Well-planned vegetarian diets are appropriate for individuals during all stages of the life-cycle including pregnancy, lactation, infancy, childhood and adolescence and for athletes."

**ADA 2009, Position of the American Dietetic Association:
Vegetarian Diets, July 2009, Vol 109, No. 7**



Facts on Chronic Disease

Diabetes

- Over 2.6 million people in the UK have diabetes.¹⁻⁴
- England has 22,000 diabetes sufferers under the age of 17.¹
- About 10% of NHS budget is spent on diabetes: approx. £9 billion a year, equivalent to £25 million a day or over £1 million an hour.^{1,3}
- Babies of women with diabetes are five times as likely to be still-born and three times as likely to die in their first months of life.¹
- Diabetes is the leading cause of kidney failure.⁶
- Almost one in three people with Type 2 diabetes develops overt kidney disease.⁷
- Diabetes is the leading cause of blindness among adults in the UK.^{1,8,9}
- Diabetes is responsible for 60% of non-traumatic limb amputations in the UK.¹⁰
- Diabetes doubles the risk of heart attack and stroke.¹¹
- Risk of death from heart disease is 2-4 times higher in those with diabetes.¹²
- Diabetes increases the risk of cancer, especially colorectal cancer.^{13,14,15}
- Diabetes is three times more common in people who have gained 10kg during adulthood than in those who have maintained their weight.¹⁶
- By 2025, there will be more than 4 million people with diabetes in the UK.¹⁻⁴ 90% will be Type 2 diabetes, due to rapidly rising numbers of overweight and obese people.¹

Obesity

- 25% of adults in the U.K. are obese, and about 60% are overweight or obese.¹⁷
- Total UK costs of obesity related conditions are £4.2 billion a year.¹⁸
- In 2004, 34,100 deaths were attributable to obesity, equating to 6.8% of all deaths in England.²⁰
- 1 in 7 boys and girls aged 2-10 in the UK are overweight or obese.²¹
- More than 1 in 5 children are overweight or obese by age 3.²²
- If no action is taken, by 2015, 36% of males and 28% of females (aged between 21 and 60) will be obese.²³

Cardiovascular Disease

- Heart and circulatory disease is the UK's biggest killer.²⁴
- In 2008, over 191,000 died from heart and circulatory disease in the UK.²⁴
- CVD is estimated to cost the UK economy around £30 billion a year.²⁴
- A substantial proportion of cancers²⁵ and over 30% of deaths from circulatory disease²⁶ could be avoided, mainly through stopping smoking, improving diet and increasing physical activity.²⁷

Chronic Disease: Cause, Prevention and Cure Diabetes



Joel Fuhrman MD
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Type II diabetes, which accounts for over 90% of diabetes cases, is preventable and even reversible with excellent nutrition

Excess body fat is the most significant cause of type II diabetes.

In order to reverse the rising trends of obesity and diabetes and their associated costs, we must emphasize prevention and treatment via dietary and lifestyle modifications.

How Does Obesity Cause Diabetes?

Every cell in the human body needs glucose. Insulin promotes uptake and storage of glucose in muscle and fat cells. Type II diabetes is a disease of insulin resistance – the body is not adequately responding to the insulin being produced.

Obesity is related to the development of diabetes for several reasons. Fat cells are not merely storage houses for extra energy – they produce and secrete substances with significant biological effects, including interfering with the uptake of insulin into other cells. Fat cells release substances such as free fatty acids, hormones, and cytokines that promote insulin resistance¹. Furthermore dietary trans fats and saturated fats interfere with insulin binding to its receptors.²

When an individual is significantly overweight or obese, with more than 50 pounds of additional fat weight, the body demands huge loads of insulin from the pancreas. After years of overworking the pancreas, it loses the ability to keep up with the huge insulin demands. Eventually, with less insulin available to move glucose from the bloodstream into the cells, the glucose level in the blood starts to rise and the person is diagnosed with diabetes.

Drugs Do Little To Help, and Often Can Make Things Worse

Medication is now the accepted treatment for diabetes – even though it's often the medication itself that is causing more weight gain, worsening symptoms, and making the individual more diabetic. Insulin and many of the oral anti-diabetes drugs promote weight gain, exac-

“The majority are able to restore their glucose levels to the normal range without any further need for medications. They have essentially become non-diabetic again”

A high nutrient density diet, after an initial phase of adjustment during which a person experiences “toxic hunger” due to withdrawal from pro-inflammatory foods, can result in a sustainable eating pattern that leads to weight loss and improved health. A high nutrient density diet provides benefits for long-term health as well as weight loss.

Nutrition Journal. 2010 Nov 7;9:51.

erbing the condition.³ Type II diabetic patients exposed to insulin or sulfonylureas (commonly prescribed oral anti-diabetes drugs) which push the failing pancreas to produce more insulin, advance the natural deterioration of the beta cells in the pancreas and have significantly increased incidence of cancer at multiple sites,^{4,5} higher risk of heart failure and all-cause mortality.⁶

The ACCORD (Action to Control Cardiovascular Risk in Diabetes) study was conducted to determine whether lowering glucose to near-normal levels (HbA1C <6.0%) with drugs would decrease cardiovascular risk; the study was halted when the results showed that aggressive glycemic control actually increased the risk of death from all causes and from cardiovascular disease.⁷

Clearly, relying on medication without utilizing dietary and exercise interventions is not ideal. Diabetics take medication but remain overweight and continue to consume the Western diet; they continue to damage their organs, develop complications, and die prematurely.

How Can We Prevent (and reverse) Diabetes?

The cure for type II diabetes is already known – removing the cause can reverse the disease, and the chief cause is excess weight from the Western diet and inactivity. The best and safest “medicine” for a diabetic is a high-nutrient density diet (HND diet; an eating style focused on low-calorie, nutrient-rich plant foods) and exercise. Weight loss is effective in itself¹, but the goal of lifestyle intervention must be to improve pancreatic function and lower insulin resistance over and above what could be accomplished with weight loss alone. An HND diet can accomplish this; by emphasizing micronutrient adequacy, cholesterol, triglycerides, and blood pressure are lowered as weight is lost and blood glucose drops. We have extensive experience treating overweight diabetics with superior nutrition and the results are impressive. The majority are able to restore their glucose

Chronic Disease: Cause, Prevention and Cure

Diabetes

levels to the normal range without any further need for medications. They have essentially become non-diabetic again.

Overview of an HND Diet for Diabetes Reversal:

- No refined carbohydrates – both sugars and starches
- Minimal grains (intact grains only) only one serving daily
- Very high fibre (over 50 grams per day)
- High viscous fiber (flax, oats, beans)
- High percentage of resistant starch
- Moderate fat from seeds and nuts
- Very low saturated fat
- Zero trans fatty acids
- Sufficient omega-3 fatty acids
- High phytochemicals and antioxidants
- Low glycemic load
- Very low sodium (less than 1,200 mg/day)
- Low caloric density per food volume
- Minimal or no animal products, used only occasionally as one ounce condiment

The HND diet consists primarily of foods that have been associated with diabetes prevention in the medical literature: its focus is on eating more vegetables, especially low-calorie, high nutrient vegetables such as green vegetables, eggplant, onion, mushrooms, tomatoes, cauliflower, spaghetti squash, zucchini squash and legumes. Animal products are significantly curtailed or eliminated as are processed foods, sweeteners, white rice, white flour, oils and caloric sweeteners. Of note:

- Pooled data from four studies determined that eating 1.35 servings (1 serving = 106 g) of green leafy vegetables vs. 0.2 servings per day provided a 14% decrease in diabetes risk⁸
- Beans are high-nutrient, high-fibre, and low-calorie. They are digested slowly which induces satiety and stabilizes blood glucose. Therefore, beans are the most appropriate source of carbohydrate for diabetics. A study on 64,000 women followed for 4 years found that high intake of legumes were associated with a 38% decreased risk of diabetes⁹
- An inverse relationship between nut consumption and diabetes was reported in the Nurses' Health Study – 5 servings of nuts per week was associated with a 27% decrease in risk¹⁰
- Adding three servings of fresh fruit (with a focus on low sugar fruits) per day to one's diet may decrease diabetes risk by up to 18%¹¹

“A plant-based micronutrient rich diet has tremendous therapeutic potential while decreasing cardiovascular risk factors”

“Whole, plant foods have anti-diabetic characteristics”

Scientific support for the therapeutic use of plant-based diets for diabetes

Whole, plant foods have anti-diabetic characteristics.¹² As such, randomized trials using a plant-based diet to treat diabetes have yielded impressive results. In a 22-week study published in 2006, a low-fat plant-based diet allowed for an average decrease of 1.23 points in A1C, weight loss of 13 lbs., and 21.2% decrease in LDL cholesterol. Most importantly, 43% of the participants were able to reduce their diabetes medications. An earlier study reported a 28% decrease in fasting blood glucose, as well as reduction or discontinuation of diabetes medications.¹³ An HND diet, however, potentially has further advantages over a low-fat vegan diet, because an HND diet is based primarily on green vegetables and beans rather than grains and starches, which provides greater micronutrient and resistant starch content. Data was collected from thirteen subjects at baseline and after a median of seven months on a HND diet. Mean values are shown in the table below:¹⁴

	Baseline	HND (Plant-based High Nutrient Diet)
HbA1C	8.2%	5.8%
Blood pressure	148/87 mmHg	121/74 mmHg
Triglycerides	171 mg/dl	103 mg/dl
HDL	48.3 mg/dl	54.6 mg/dl
Number of medications	4	1

Conclusion

The current standard of treating diabetes with medications does little to improve long-term patient outcomes, has significant drawbacks and in many cases the medications serve as subconscious permission to continue eating improperly. Evidence on nutritional interventions for diabetics from multiple investigations as well as our own data demonstrates that a plant-based micronutrient rich diet has tremendous therapeutic potential while decreasing cardiovascular risk factors. Additionally, in an earlier study an HND diet was shown to reduce LDL cholesterol by 33%.¹⁵ This approach promotes longevity and in many cases can even resolve the diabetes. If this approach was used on a large scale, for both prevention and reversal of chronic disease, rates of obesity, diabetes, cardiovascular disease, and cancer would all drop, resulting in a healthier population and a dramatic reduction in healthcare costs.

Chronic Disease: Cause, Prevention and Cure

Coronary Disease



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Is the Present Therapy for Coronary Artery Disease the Radical Mastectomy of the Twenty-First Century?

To fully grasp how so many smart, right-minded people could get it so wrong, it might help to start with a quick review of medical history. Take the radical mastectomy, conceived by William Halsted¹ in the late 19th century. The procedure was intended to remove all cancer cells of the breast, the overlying skin, the underlying muscle, and regional lymph nodes. It was mutilating, permanently disfiguring, and no more effective than less radical, less disfiguring procedures. Still, because of the prestige and respect Halsted commanded as a teacher of surgeons, his disciples defended and taught the radical mastectomy at the most revered medical colleges. His extreme surgery was perpetuated for almost a century, until challenges by courageous physicians in Europe^{2,3} and America,⁴ along with a prospective randomized study by Dr. Bernard Fisher,⁵ finally sounded the death knell of this standardized surgical error of the century.

The 21st century analogue to this unfortunate chapter is the interventional and pharmaceutical treatment of coronary artery disease. The purveyors of this treatment acknowledge that it is but a stopgap therapy. And as in the case of the radical mastectomy, there is a far more effective, cost-effective, and sustainable treatment.

There is widespread agreement that the Western diet of processed oils, white flour, dairy, and meat progressively causes endothelial dysfunction and injury, diminution of nitric oxide, increased vascular adhesion molecules, endothelial permeability, low-density lipoprotein oxidation, foam cell formation, generation of reactive oxygen species, plaque cap thinning, and plaque rupture, which lead to clinical events. Contributing risk factors include a family history, hypertension, smoking, hypercholesterolemia, diabetes, metabolic syndrome, and obesity.

Medications commonly used for this illness include β blockers, angiotensin-converting enzyme inhibitors or angiotensin recep-

“Patients lose weight, blood pressure normalizes, and type 2 diabetes improves or resolves, as do angina, erectile dysfunction, and peripheral vascular and carotid disease”



tor blockers, statins, anticoagulants, and aspirin. The interventions include angioplasty with or without bare-metal or drug-coated stents, atherectomy, and coronary artery bypass surgery. Exercise may be prescribed and smoking cessation encouraged. Some patients may receive nutritional advice from a dietician or nutritional therapist, who often lacks knowledge or training in disease prevention and reversal.

For the minority of heart patients, specifically those in the midst of heart attacks or acute coronary syndromes, stents or coronary artery bypass may be lifesaving. For the rest, none of the present therapies targets the cause: the Western diet. As a consequence, the disease marches on in all patients, which leads to more drugs, stents, and bypasses, increasing heart damage, heart failure, and, too often, death, from an essentially benign, food-borne illness.^{6,7}

This food-borne illness has taken root in the hearts of even the “healthiest” followers of the Western diet, as proved by autopsy studies.^{8,9,10} There is ample evidence linking diet and disease: in plant-based cultures such as rural China,¹¹ the Papua highlanders in New Guinea,¹² central Africa, and the Tarahumara Indians of northern Mexico,¹³ coronary artery disease is virtually nonexistent. Conversely, plant-based cultures that adopt Western, animal-based nutrition promptly develop coronary artery disease.

The reverse is also true. Deaths from heart disease and stroke plummeted from 1939 to 1945, during World War II, when the occupying German forces deprived Norwegians of their livestock, and rationing resulted in greatly diminished animal-derived foods. Within 2 years of the restoration of meat and dairy consumption after the cessation of hostilities in 1945,¹⁴ death rates from stroke and heart attack approached their pre-1939 levels.

In 1985, I initiated a study that treated seriously ill patients with coronary artery disease with plant-based nutrition and succeeded in the arrest and reversal of their disease. This program has been published at 5,¹⁵ 12,¹⁶ 16,¹⁷ and most recently summarized at 20 years in my book *Prevent and Reverse Heart Disease*,¹⁸ making it one of the longest investigations of its type in medical research. The duration of the study is testimony that patients with coronary disease will adhere to these food changes for decades and beyond. Patients lose weight, blood pressure normalizes, and type 2 diabetes improves or resolves, as do angina, erectile dysfunction, and peripheral vascular and carotid disease. Angiographic reversal can be striking (Figure 2).

Despite widespread and growing awareness of this straight-

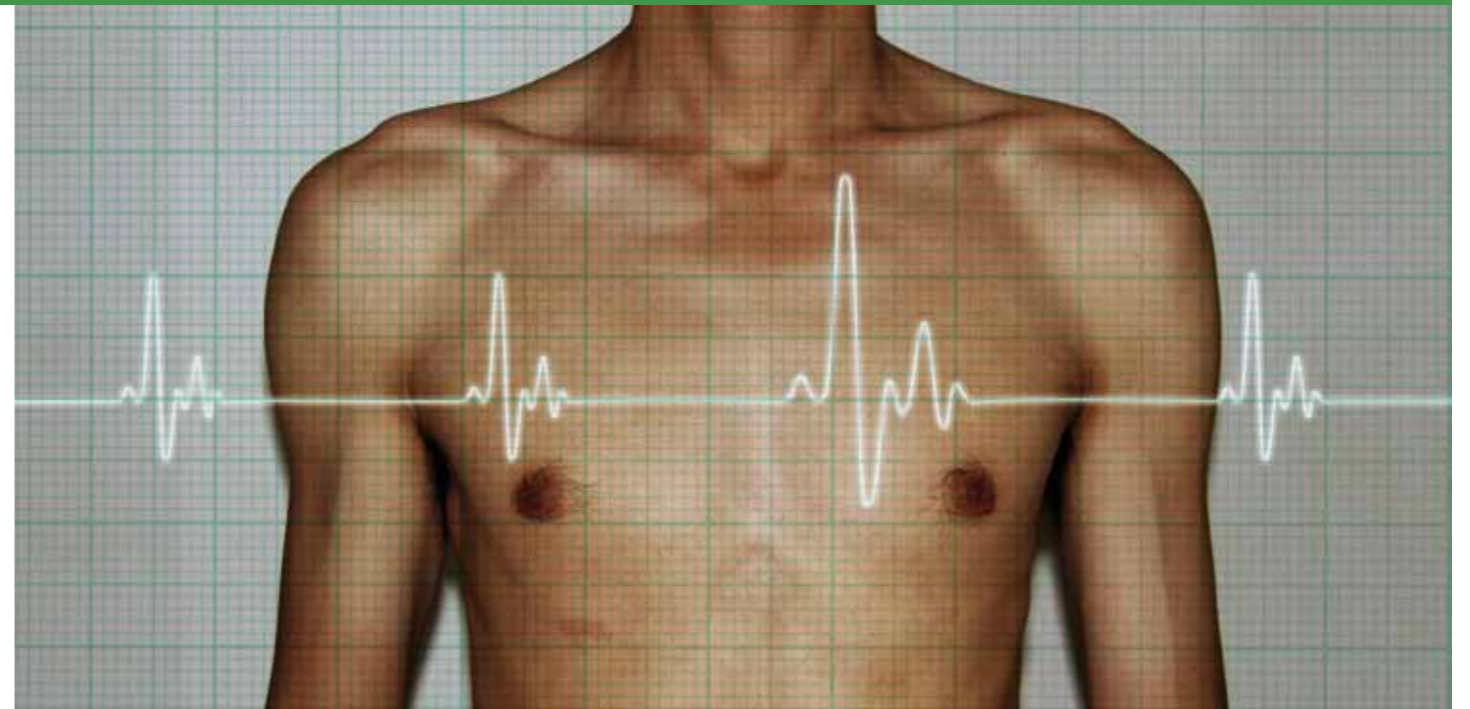
“Genes load the gun, but lifestyle pulls the trigger”



forward, painless, and inexpensive therapy, it is infrequently used. Physicians assert that their patients will not follow this approach. The hundreds of patients we have treated and our original study participants, who switched from a Western diet full of oil, processed foods, meat, and dairy to plant-based nutrition, are testimony to the contrary. Why have we succeeded where others have failed? Most physicians, who see 20 to 30 patients per day, have no time, background, or passion for nutritional counselling and lack training in behavioural modification.

Our success in counselling patients in how to arrest and reverse heart disease is directly related to the time and effort we expend to help them understand the connection between diet and disease. The first 3.5 hours of counselling include a detailed review of disease epidemiology and causation. In the next hour, we discuss which foods to avoid and which to eat, including advice on how to read ingredients in nutritional labels and shop for food, how to eat out (at friends' homes, at restaurants, and on the road), and how to prepare a variety of plant-based foods. During the last 45 minutes, we serve a plant-based lunch, exchange ideas, and answer questions. We schedule regular follow-up by phone and/or e-mail with all patients. The result: patients report that this is the most significant and enduring medical encounter they have experienced. More importantly, they acquire an understanding of what caused their disease and how they can stop and reverse it.

Contrary to the argument that “patients will not do this,” we find that patients rejoice once they understand their disease and how they may halt it. It is condescending to suggest that patients have no interest in healing themselves. One of my surgical mentors used to say, “Inappropriate application of the method is no excuse for its abandonment.” Although busy, physicians must develop an appre-



ciation for nutritional counselling's capacity to eradicate disease and can refer patients to a variety of specially developed programs, or delegate the counselling to members of their teams who have apprenticed in such programs.

Present cardiovascular therapy has become a standardized error, as it does nothing to prevent disease. None of the drugs or procedures that constitute the lion's share of the annual \$500 billion expenditure on cardiovascular disease treat the cause or halt its progression.¹⁹ In contrast to the standard approach, this nutrition-based program is not dangerous, there is no mortality or morbidity, and aside from a modest counselling expense, it is virtually free, as we all must eat. The benefits of stents, bypass surgery, and drugs are transient as disease continues to progress, while those of counselling endure and improve with time.

Sadly, today our adolescents are but a decade or 2 away from compounding this epidemic. It is time to tell the truth. Family history and genetic background do not cause this illness. It is not the luck of the draw. It is a matter of personal action and responsibility. Genes load the gun, but lifestyle pulls the trigger. It all starts and stops with

The high-fat American diet is responsible for an epidemic of coronary artery disease. A plant-based diet with less than 10% fat will prevent coronary disease from developing, halt the progress of existing disease, and even reverse the disease in many patients.

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“Most coronary disease need never exist, and where it does exist, it need not progress”

our endothelium, the guardian and lifejacket of our blood vessels. If we destroy our endothelium, we develop the disease. If we restore our endothelium, we vanquish our disease.

Of course, several mutually reinforcing institutional and commercial interests oppose this lifestyle intervention. Every 5 years, the United States Department of Agriculture, controlled by agricultural interests, issues a food pyramid laden with foods that predispose millions of Americans to perish from cardiovascular disease. The pharmaceutical industry takes in billions in profits from heart disease.²⁰ The stent industry makes \$5 billion annually.²¹

The time is long overdue for legendary work. We can hardly be proud of a drug and interventional therapy that results in death, morbidity, inordinate expense, and disease progression and can never halt this food-borne epidemic. Every patient with this disease should be made aware of this safe, simple, enduring option to cure himself or herself. Most coronary disease need never exist, and where it does exist, it need not progress.



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Cancer as the exception, not the norm?

Numerous research studies have shown that cancer is more common in populations consuming diets rich in fatty foods, particularly meat, and much less common in countries with diets rich in grains, vegetables, and fruits.¹ In rural Asia and Africa, for example, traditional diets are based on rice or other grains, starchy vegetables, fruits, and beans, and people eating these diets generally avoid the disease. If cancer does strike, they also seem to have better survival rates.²

When these populations trade their traditional diets for Western foods, their cancer rates promptly change. In Japan, dramatic diet changes began after World War II: traditional rice dishes were gradually replaced with hamburgers; dairy products, which had been almost unknown became popular; carbohydrate intake fell and fat consumption soared. Soon, cancer rates began to rise, as did the toll of obesity, heart problems, and other diseases.²

Common cancers and the role of diet

Prostate cancer – saturated fat vs plant-based nutrition

In 1999, researchers in Québec City reported their findings after following 384 men with prostate cancer over a five-year period. It turned out that those who consumed the most saturated fat—the kind particularly prevalent in meats and dairy products—had three times the risk of dying from the disease compared to those with the lowest saturated fat intake.³

Evidence already suggests that men with prostate cancer—and their families—should be encouraged to adopt a low-fat vegan diet. By

boosting vegetables, fruits, beans, and whole grains, and avoiding dairy products, meats, eggs, and fried foods, men are able to take advantage of protective nutrients and avoid cancer promoting factors.⁴

Breast cancer –oestrogen, fats, and fibre

Diets rich in meat, dairy products, fried foods, and even vegetable oils cause a woman's body to make more oestrogen. In turn, that extra oestrogen increases cancer risk in the breast and other organs that are sensitive to female sex hormones. In simple terms, oestrogen makes things grow; not only normal tissues, but also cancer cells.⁵ When oestrogen is added to breast cancer cells in a test-tube, they multiply rapidly.⁶ In fact, one of the main goals of breast cancer treatment is to reduce oestrogen's effects.⁹ When a woman begins a low-fat, high-fiber diet, the amount of oestrogen in her blood drops almost immediately. In a matter of weeks, the amount in her bloodstream drops by 15–50 percent.^{7,8} She will still have more than enough oestrogen for fertility, but she will nonetheless have less oestrogen than before.⁹ This reduction of oestrogens seems to reduce the likelihood that cancer cells will multiply or spread.¹

Colon cancer – red meat, processed meat

Large studies in England and Germany have shown that vegetarians are about 40 percent less likely to develop cancer compared to meat eaters.^{10,11,12} The Cancer Prevention Study II, which involved

Ecologic, case-control, cohort, and randomized, controlled studies have demonstrated the benefits of a low-fat, high-fibre diet for breast and prostate cancer survival. A plant-based diet, generally low in fat and high in fibre, may offer survival benefits for both breast and prostate cancer.

Ethnicity & Disease 2007 Spring; 17(2 Suppl 2):S2-18-22.

148,610 adults followed up since 1982, showed that the group with the highest red meat intake had approximately 30–40 percent higher colon cancer risk, and the group with the highest processed meat intake had approximately 50 percent higher risk compared to those with lower intakes.¹³

Further dietary factors in the cause and prevention of cancer

The perils of free radicals

In the course of the normal chemical reactions that occur in the bloodstream or inside our cells, oxygen can easily become unstable. These unstable and dangerous oxygen molecules are called 'free radicals'.¹⁴ When free radicals damage chromosomes, cells can lose their ability to control their basic functions and begin to multiply out of control – and that is the beginning of cancer. Biologists believe that much of the aging process and many cancers are caused by free radical damage.¹⁵

Protection against free radicals – antioxidants

Plants produce natural compounds called antioxidants which protect the plant from oxygen free radicals. One of the best-known antioxidants is beta-carotene, the yellow-orange pigment found in carrots, mangoes and the like. It enters the cell membranes surrounding each of the cells in our body and stays there to fend off any free radicals

“Dairy products also appear to play an important role in cancer risk”

that might approach.¹⁵ An even more powerful antioxidant is Lycopene, the bright red pigment providing the colour for tomatoes, watermelon, etc.,¹⁶ which has been linked with reduced prostate cancer risk.^{17,18}

Vitamin E and the mineral selenium also protect cells from free radicals. Vitamin E is found in legumes (beans), whole grains, and plants rich in natural oils (such as nuts and seeds).¹⁹ Vitamin C is another powerful and well-known antioxidant. Citrus fruits are famous for it, but there are surprisingly large amounts in many vegetables.²⁰ By eating plant-based foods, we are protecting our bodies from dangerous free radicals.

Dairy – a cancer risk

Typical dairy products (milk, cheese, etc.) are loaded with fat and cholesterol, and researchers are discovering that dairy products also appear to play an important role in cancer risk.¹ One way that milk may influence cancer risk is by increasing the amount of IGF-1 (insulin-like growth factor 1) in the blood. IGF-1 is a powerful stimulus for cancer cell growth. Milk is also high in fat and has no fibre at all. As a result, it may increase the body's production of testosterone, which is linked to prostate cancer risk. Milk also appears to interfere with the activation of vitamin D, which is actually a hormone that helps the body absorb calcium from the digestive tract and protect the prostate against cancer.²¹

A strong immune system key to cancer prevention

The immune system is critically important in fighting cancer. The antioxidants, beta-carotene, vitamin C, and vitamin E are all immune boosters. If the immune system is vigilant, it recognizes and destroys cancer cells before they can take hold.²² Researchers at the German Cancer Research Center compared blood samples of vegetarians and healthy non-vegetarians, separating out the type of white blood cells called 'natural killer' (NK) cells, which engulf and destroy cancer cells. The vegetarians had approximately double the natural killer cell activity of the nonvegetarians.²³

Cooked meat carcinogens

As meats are cooked, cancer-causing chemicals called heterocyclic amines tend to form within the meat tissue.²⁴ Dietary changes away from meat and dairy help to reduce the amount of cancer-causing agents in the bloodstream and help our bodies eliminate all manners of chemicals. Fibre, for example, moves intestinal contents along,

Chronic Disease: Cause, Prevention and Cure Cancer



“As meats are cooked, cancer-causing chemicals called heterocyclic amines tend to form within the meat tissue”

so that whatever carcinogens (cancer-causing chemicals) may be in waste products are expelled from the body faster. The first key to building a high-fibre diet is to eat plenty of vegetables, fruits, beans, and whole grains and to avoid animal products.²⁵

Healthful plant-based (vegan) diets help prevent cancer, improve survival

Studies have amply demonstrated the ability of diets rich in vegetables and fruits to reduce the likelihood that cancer will develop in the first place.²⁶ These dietary factors tend to work together: a diet that is higher in fruits and vegetables will also tend to be high in fibre, antioxidants, and low in fat.²⁷ Organically grown plant foods are ideal as they not only avoid potentially carcinogenic pesticides and fertilizers, but are more flavourful, more nutritious and richer in antioxidants and other phytochemicals than conventionally grown crops.²⁸ In turn, those who eat such diets tend to be slimmer, thus avoiding the risks of overweight,²⁹ and studies have shown that slimmer people are less likely to develop cancer.³⁰ Of course, a slimmer body is not the only benefit of this type of nutritious menu; low-fat vegetarian and vegan diets have been used to reverse heart disease, bring diabetes under control, lower blood pressure and achieve many other health goals.^{31,32,33,34,35,36} Furthermore, studies have also suggested that cancer survivors who consume more vegetables and fruits do indeed live longer, cancer-free lives.³⁰

Chronic Disease: Cause, Prevention and Cure Animal Agriculture and Public Health



Michael Greger MD
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Industrial Animal Agriculture’s Role in the Emergence and Spread of Disease

Over the last few decades, there has been a dramatic resurgence in emerging infectious diseases, approximately three-quarters of which are thought to have come from the animal kingdom. The World Health Organization defined the term “zoonoses” to describe this phenomenon.¹ This trend of increasing emergence is expected to continue,² and the U.S. Institute of Medicine suggests that without appropriate policies and actions, the future could bring a “catastrophic storm of microbial threats.”³

What new changes are taking place at the human/animal interface that may be responsible for this resurgence of zoonotic disease in recent decades? In 2004, a joint consultation was convened by the World Health Organization, the Food and Agriculture Organization of the United Nations, and the World Organization for Animal Health to elucidate the major drivers of zoonotic disease emergence.⁴ A common theme of primary risk factors for both the emergence and spread of zoonoses was “increasing demand for animal protein,” associated with the expansion and intensification of animal agriculture.

Strep suis

In 2005, China, the world’s largest producer of pork,⁵ suffered an unprecedented outbreak in scope and lethality of *Streptococcus suis*.⁶ *Strep. suis* is a common cause of meningitis in intensively farmed pigs worldwide and presents most often as meningitis in people as well.⁷ Due to involvement of the auditory nerves connecting the inner ears to the brain, half of the human survivors become deaf.⁸ The World Health Organization reported that it had never seen so virulent a strain⁹ and blamed intensive confinement conditions as a predisposing factor in its sudden emergence, given the stress-induced suppression of the pigs’ immune systems.¹⁰

“Homo sapiens have dramatically altered the ecological landscape in which other species and their pathogens must function. Along with human culpability, though, comes hope: If changes in human activity can cause new diseases, then changes in human activity may prevent them in the future.”

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Nipah virus

This *Strep. suis* outbreak followed years after the emergence of the Nipah virus on an intensive industrial pig farm in Malaysia. Nipah turned out to be one of the deadliest of human pathogens, killing 40% of those infected, a toll that propelled it onto the U.S. list of potential bioterrorism agents.¹¹ Even more concerning, a 2004 resurgence of Nipah virus in Bangladesh showed a case fatality rate on par with Ebola—75%—and showed evidence of human-to-human transmission.¹² The Nipah virus, like all contagious respiratory diseases, is a density-dependent pathogen.¹³ “Without these large, intensively managed pig farms in Malaysia,” the director of the Consortium for Conservation Medicine said, “it would have been extremely difficult for the virus to emerge.”¹⁴

Multidrug-resistant bacteria

Another risky industrial practice is the mass feeding of antibiotics to farm animals.

“[E]very inappropriate...use of antibiotics in...agriculture is potentially signing a death warrant for a future patient.”

Chief Medical Officer Sir Liam Donaldson, 2009 annual report¹⁵

The use of growth-promoting antibiotics in industrial animal agriculture may be responsible for the majority of the increases in antibiotic-resistant human bacterial illness,¹⁶ a public health problem of global significance.¹⁷ The 2008 discovery of MRSA in the majority of pigs tested in North America suggests the potential public health

“A common theme of primary risk factors for both the emergence and spread of zoonoses was ‘increasing demand for animal protein’”



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risk attributed to farm animal-associated MRSA may be a global phenomenon.

Avian and swine influenza (Bird Flu and Swine Flu)

The dozens of emerging zoonotic disease threats must be put into context. SARS, which emerged from the live animal meat markets of Asia,¹⁸ infected thousands of humans and killed hundreds. Nipah infected hundreds and killed scores. AIDS, which arose from the slaughter and consumption of chimpanzees (Hahn, et al. 2000), has infected millions, but there is only one virus known that can infect billions—influenza.

Influenza is considered by the U.S. Centers for Disease Control and Prevention’s Keiji Fukuda to be the only pathogen carrying the potential to “infect a huge percentage of the world’s population inside the space of a year.”¹⁹ In its 4,500 years infecting humans since the first domestication of wild birds, influenza has always been one of the most contagious pathogens.²⁰ Only since 1997 with the emergence of the highly pathogenic strain H5N1 has it also emerged as one of the deadliest.

An influenza pandemic in 1918 became the deadliest plague in human history, killing up to 100 million people around the world,²¹ and that 1918 flu virus was likely a bird flu virus,²² that made more than one-quarter of the world’s population ill and killed more people in 25 weeks than AIDS has killed in 25 years.²³ In 1918, the case

Chronic Disease: Cause, Prevention and Cure

Animal Agriculture and Public Health

“Influenza is considered by the U.S. Centers for Disease Control and Prevention’s Keiji Fukuda to be the only pathogen carrying the potential to infect a huge percentage of the world’s population inside the space of a year.”

mortality rate was less than 5%.²⁴ H5N1, in comparison, has so far officially killed half of its human victims.²⁵

What has changed in recent years that led us to this current crisis? According to Dr. Robert Webster, the “godfather of flu research,” it is because “farming practices have changed. Previously, we had backyard poultry....Now we put millions of chickens into a chicken factory next door to a pig factory, and this virus has the opportunity to get into one of these chicken factories and make billions and billions of these mutations continuously. And so what we’ve changed is the way we raise animals....”²⁶

The United Nations specifically calls on governments to fight what they call “factory farming”: “Governments, local authorities, and international agencies need to take a greatly increased role in combating the role of factory farming [which, combined with live bird markets] provide ideal conditions for the virus to spread and mutate into a more dangerous form.”²⁷

The primary ancestor of the 2009 pandemic virus was a triple hybrid swine flu mutant that arose and spread throughout factory farms in the United States in 1998. Currently the greatest concern is that the H1N1 swine flu might be able to combine with the H5N1 bird flu, both of which have been found in pigs. If a single pig in parts of Asia or Africa where bird flu has become endemic becomes co-infected a virus could theoretically emerge with the human transmissibility of swine flu, but also with the human lethality of bird flu.

According to a spokesperson for the World Health Organization, “The bottom line is that humans have to think about how they treat their animals, how they farm them, and how they market them—basically the whole relationship between the animal kingdom and the human kingdom is coming under stress.”²⁸ Along with human culpability, though, comes hope. If changes in human behaviour can cause new plagues, changes in human behaviour may prevent them in the future.

For a more in-depth discussion, please see Dr Greger’s invited review in Critical Reviews in Microbiology at <http://bit.ly/GregerReview>

Conclusion

The Government faces the challenge of reducing NHS costs while improving public health. While traditional medicine remains the foundation of healthcare, drives to influence behaviour have also proven key in minimizing health risks; reducing tobacco use being a prime example of the successful amalgamation of policy and public awareness campaigns. A similarly determined partnership of NHS professionals and Government to promote significant dietary change, towards healthier plant-based foods, could have even greater benefits.

At present, the NHS spends a substantial amount of its budget on diabetes, obesity, cardiovascular disease, and related illnesses. The basic cost of medicines in 2009 was more than £1.6billion¹ for treating cardiovascular disease and over £600million for diabetes², with obesity increasing more than sevenfold from 2000 to £46.8 million³. While these costs have continued to rise each year squeezing already tight health budgets, reducing working-age ill health could save the UK up to £100 billion a year; around the size of the entire annual NHS budget⁴.

The role of animal-based foods in the causation of these chronic diseases is well established, as elucidated in the preceding articles by Drs Esselstyn et al, as well as high profile studies such as those of the European Prospective Investigation into Cancer (EPIC)⁵ and so on. In one projection, the Lancet reported that even a conservative 30% reduction in animal fats would reduce heart disease and premature deaths in the UK by 15-17%⁶. In addition, ongoing studies in numerous peer reviewed medical journals demonstrate the efficacy of plant-based diets in the prevention of chronic diseases.⁷

Substantial diet change is crucial to tackle the obesity crisis in children also. Currently, more than 1 in 5 children in the UK are overweight or obese by the age of 3, and the nation has the highest child obesity rates in Europe.⁸ As obesity is a precursor and contributor to many other serious conditions, including diabetes and heart disease, without rigorous and resolute efforts to promote healthier diets and lifestyles the public health crisis will escalate incurring corresponding costs to the NHS and ultimately the economy.

Worldwide, research from significant institutions in many fields – such as health, climate change, biodiversity, and nutrition, and including the UNEP – has led to their recommending a drastic minimization of animal product consumption.^{10,11,12}

In the US, there have already been moves to enhance the nutritional awareness of medical professionals, such as the introduction of a Senate Bill to augment the nutritional aspect of medical courses and provide ongoing training for physicians.¹³ The benefits of these and other diet-diversifying approaches are there for the taking, given the willingness for assertive and coordinated action. Of course, the health crisis is not the only one presently facing the nation; the perils of climate change also provide impetus for urgent action.

In 2009, the European Parliament officially recognized that livestock raising contributes to global warming, and acknowledged the need for changes to agricultural practices, environmental legislation and structural reforms¹⁴. Indeed, numerous studies have pinpointed the livestock industry as a major cause of greenhouse gas (GHG) emissions, water pollution, water shortage, and deforestation, also finding that reduced meat and dairy consumption would be a most effective way to reduce such critical impacts.^{15,16}

A shift away from livestock farming would reduce the levels of potent warming GHG methane and free up extensive areas for reforestation, in turn capturing and sequestering carbon dioxide in the long term while restoring natural habitats and encouraging biodiversity.^{17,18} Yet greater benefits to the environment are obtainable through the organic production of plant-based foods. The Rodale Institute found that up to 40% of atmospheric CO2 could be absorbed through organic farming practices.¹⁹ In health terms, organic foods contain significantly less pesticide residues. Furthermore, a 2010 Dutch govt study stated that a shift to a plant-based diet would cut climate mitigation costs 80% by 2050.²⁰

There are many steps which can be taken by the Government and health professionals to help improve public health and substantially reduce rising costs through taking advantage of the numerous health benefits of plant-based diets; principally the prevention and reversal of chronic disease as evidenced by population surveys, interventional and nutritional studies. By addressing the causes of chronic disease billions of pounds can be saved in NHS costs, along with the obvious reduction of suffering and prolongation of life.

Proposed measures:

- 1 Further training of doctors and other health professionals on the benefits of plant-based diets including the prevention of chronic disease, and more substantial curricula on nutrition in student medical and nursing courses.
- 2 Establishing Nutritional Information Centres to provide advice and support for patients and public as well as information on addressing causes of dietary-related illness. Pharmacies also could serve as information access points for printed and multimedia materials.

“Households should select predominantly plant-based diets rich in a variety of vegetables and fruits, pulses or legumes, and minimally processed starchy staple foods.”

World Health Organization and UN FAO⁹

- 3 Introducing wholesome plant-based menu options in hospitals, including cafeterias, for patients and personnel, with animal products replaced with healthier meat-substitute products.
- 4 Educating young people on nutrition, specifically on the harms of saturated fats from animal products and the related rise in chronic disease, versus the personal (and optionally, environmental and public) health benefits of plant-based nutrition; also introducing meat free days and plant based menu options in schools, colleges and universities; incorporating plant-based cooking classes etc.
- 5 Increasing subsidies for vegetable, fruit, grain and pulse farming, as well as for veggie-meat and dairy-substitute producers to encourage higher output and consumption. Consideration of further subsidies for organic practices
- 6 Dialogue with food producers and retailers to increase number and availability of meat- and dairy-free options
- 7 Council/Regional ‘meat free days’ (e.g. weekly) and other creative ‘plant-based promotions’: distribution of informative materials, ‘veggie-vouchers’, encouraging town/city cafeterias, restaurants, schools, to only serve meat free options on a certain day; following from and developing on the successful example of such cities as Ghent in Belgium. On a national level. ‘meat free days’ and attractive plant-based menu options in Government departments, functions, and public events.
- 8 Promoting/advertising plant-based meat, dairy and egg substitutes and their benefits, with corresponding reduction of Govt-funded animal products promotions, including through novel creative and social media.
- 9 Devising a labelling system showing the environmental rating or cost (e.g. water footprint and carbon footprint) of certain food items, and also health warnings where appropriate (for example processed meats’ cancer risk²¹)
- 10 Establishing of a task force or other specific body to develop and assess best-outcome strategies for encouraging a societal shift towards more plant-based nutrition, consisting of representatives from government, healthcare, agriculture and education, perhaps incorporating public consultation
- 11 Introducing higher taxes on meat and dairy products reflecting their environmental and health costs; in line with taxation of other products impacting adversely on health such as tobacco and alcohol
- 12 UK to take the international lead in the advocacy, promotion and implementation of plant-based policies and incentives, setting a benchmark in healthcare, environmental protection and policy innovation

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