

## *The China Study (book)*

<i>The China Study: Startling Implications for Diet, Weight Loss, and Long-Term Health</i>	
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*The China Study* is a 2005 book by T. Colin Campbell, Ph.D., and his son, Thomas M. Campbell II, M.D. It examines the relationship between the consumption of animal products and illnesses such as cancers of the breast, prostate, and large intestine, diabetes, coronary heart disease, obesity, autoimmune disease, osteoporosis, degenerative brain disease, and macular degeneration.<sup>[1]</sup> The book had sold 500,000 copies as of January 2011, making it one of America's best-selling books about nutrition.<sup>[2]</sup>

"The China Study" of the title is taken from the China-Cornell-Oxford Project, a 20-year study conducted by the Chinese Academy of Preventive Medicine, Cornell University, and the University of Oxford, described by *The New York Times* as "the Grand Prix of epidemiology." T. Colin Campbell was one of the project's directors. The study examined mortality rates, diets, and lifestyles of 6,500 people in 65 rural counties in China, and concluded that people with a high consumption of animal-based foods were more likely to suffer chronic disease, while those who ate a plant-based diet were the least likely.<sup>[2]</sup> The study was conducted in China because it has a genetically similar population that tends to live in the same way in the same place and eat the same foods for their entire lives.<sup>[3]</sup>

The authors conclude that people who eat a plant food/vegan diet—which avoids animal products such as beef, pork, poultry, fish, eggs, cheese, and milk—will minimize or reverse the development of chronic diseases. They also recommend adequate amounts of sunshine to maintain sufficient levels of vitamin D, and dietary supplements of vitamin B<sub>12</sub> in case of complete avoidance of animal products and to minimize the usage of vegetable oils. They criticize low-carb diets, such as the Atkins diet, which include restrictions on the percentage of calories derived from complex carbohydrates.<sup>[4]</sup>

### **Misinformation about nutrition**

The book argues that "most, but not all, of the confusion about nutrition is created in legal, fully disclosed ways and is disseminated by unsuspecting, well-intentioned people, whether they are researchers, politicians or journalists," and that there are powerful industries that stand to lose a lot if Americans shift to a plant-based diet.<sup>[5]</sup>

The authors argue that earlier studies of nutrition (particularly the well-known Nurses' Health Study, which began in 1976) were flawed, because they focused on the effects of varying amounts of individual nutrients among people who were consuming a uniformly high-risk, carnivorous (animal-based) diet.<sup>[6]</sup> The authors write that "hardly any study has done more damage to the nutritional landscape than the Nurses' Health Study," and that it should "serve as a warning for the rest of science for what not to do."<sup>[7]</sup>

## **Eight principles of food and health**

The authors describe their eight principles of food and health:<sup>[8]</sup>

1. Nutrition represents the combined activities of countless food substances. The whole is greater than the sum of its parts.
2. Vitamin supplements are not a panacea for good health.
3. There are virtually no nutrients in animal-based foods that are not better provided by plants.
4. Genes do not determine disease on their own. Genes function only by being activated, or expressed, and nutrition plays a critical role in determining which genes, good and bad, are expressed.
5. Nutrition can substantially control the adverse effects of noxious chemicals.
6. The same nutrition that prevents disease in its early stages can also halt or reverse it in its later stages.
7. Nutrition that is truly beneficial for one chronic disease will support health across the board.
8. Good nutrition creates health in all areas of our existence. All parts are interconnected.

## **Arguments and evidence**

The "China-Oxford-Cornell Study on Dietary, Lifestyle and Disease Mortality Characteristics in 65 Rural Chinese Counties", called in the book "the China Study", was a comprehensive study of dietary and lifestyle factors associated with disease mortality in China, which compared the health consequences of diets rich in animal-based foods to diets rich in plant-based foods among people who are genetically similar.<sup>[3]</sup>

### **"Western" diseases correlated to concentration of blood cholesterol**

The China Study included a comparison of the prevalence of Western diseases (coronary heart disease, diabetes, leukemia, and cancers of the colon, lung, breast, brain, stomach and liver) in each county. It was based on diet and lifestyle variables, and found that one of the strongest predictors of Western diseases was blood cholesterol with a statistical significance level equal to or exceeding 99.9 percent certainty. The study linked lower blood cholesterol levels to lower rates of heart disease and cancer. As blood cholesterol levels decreased from 170 mg/dl to 90 mg/dl, cancers of the liver, rectum, colon, lung, breast, leukemia, brain, stomach, and esophagus (throat) decreased. Rates for some cancers varied by a factor of 100 from those counties with the highest rates to the counties with the lowest rates.<sup>[9]</sup>

The authors write that "as blood cholesterol levels in rural China rose in certain counties the incidence of 'Western' diseases also increased. What made this so surprising was that Chinese levels were far lower than we had expected. The average level of blood cholesterol was only 127 mg/dl, which is almost 100 points less than the American average (215 mg/dl). ...Some counties had average levels as low as 94 mg/dl. ...For two groups of about twenty-five women in the inner part of China, average blood cholesterol was at the amazingly low level of 80 mg/dl."<sup>[10]</sup>

### **Blood cholesterol levels correlated to diet, particularly animal protein**

The authors write that "several studies have now shown, in both experimental animals and in humans, that consuming animal-based protein increases blood cholesterol levels. Saturated fat and dietary cholesterol also raise blood cholesterol, although these nutrients are not as effective at doing this as is animal protein. In contrast, plant-based foods contain no cholesterol and, in various other ways, help to decrease the amount of cholesterol made by the body." They write that "these disease associations with blood cholesterol were remarkable, because blood cholesterol and animal-based food consumption both were so low by American standards. In rural China, animal protein intake (for the same individual) averages only 7.1 grams per day whereas Americans average 70 grams per day."<sup>[10]</sup>

They conclude that "the findings from the China Study indicate that the lower the percentage of animal-based foods that are consumed, the greater the health benefits—even when that percentage declines from 10% to 0% of calories.

So it's not unreasonable to assume that the optimum percentage of animal-based products is zero, at least for anyone with a predisposition for a degenerative disease."<sup>[11]</sup>

## **Mechanisms of action**

Plants protect the body from disease, they argue, because many of them contain both a large concentration of and a large variety of antioxidants, which protect the body from damage caused by free radicals.<sup>[12]</sup> Western diseases are correlated with growth, which is associated with the increased risk of initiation, promotion and progression of disease, and that growth is correlated with a diet high in animal protein. They argue that the consumption of animal protein increases the acidity of blood and tissues and that to neutralize this acid, calcium (a very effective base) is pulled from the bones. They also state that higher concentrations of calcium in the blood inhibit the process by which the body activates vitamin D in the kidneys to calcitriol, a form that helps regulate the immune system.

## **Diseases linked to diet**

### **Autoimmune diseases**

They argue that the risk of developing Type I diabetes is strongly correlated with the consumption of cow's milk by infants.<sup>[13]</sup> Autoimmune diseases such as Type I diabetes, multiple sclerosis, and rheumatoid arthritis have certain common features and may share the same cause or causes. They say that autoimmune diseases are more prevalent among people who live at higher geographic latitudes, and also among people who consume a diet high in animal protein, particularly cow's milk. They argue that vitamin D is plausibly connected to both of these correlations. Vitamin D is important for the proper regulation of the immune system, and that for people who live at higher geographic latitudes, a lack of exposure to ultraviolet sunlight can result in a deficiency. The consumption of animal protein, especially casein in cow's milk, results in higher concentrations of calcium in the blood, which inhibits the process by which the body activates vitamin D in the kidneys to a form that helps repress the development of autoimmune diseases.<sup>[14]</sup>

### **Brain diseases**

They say that cognitive impairment and dementia, including Alzheimer's disease, are linked to hypertension, high blood cholesterol, and damage caused by free radicals, and that these risk factors can be controlled by diet.<sup>[15]</sup>

### **Cancer**

The authors link breast cancer to the long-term exposure to higher concentrations of female hormones, which in turn are associated with early menarche (age at first menstruation), late menopause, and a high concentration of blood cholesterol, and that all of these risk factors are linked to growth and a diet high in animal protein (specifically casein). The average Chinese woman is exposed to about 35–40 percent of the lifetime estrogen exposure of the average British or American woman, and that the rate of breast cancer among Chinese women is about one-fifth of the rate among Western women.<sup>[16]</sup> They also argue that lower rates of colorectal cancer are associated with the consumption of plants high in fiber, such as beans, leafy vegetables, and whole grains.<sup>[12]</sup>

### **Diabetes**

The authors describe a diet study conducted by James D. Anderson, M.D., of 50 patients—25 with Type I diabetes and 25 with Type II diabetes—who were taking insulin to control their blood glucose concentrations. The authors reported that after these patients switched from the American-style diet recommended by the American Diabetes Association to a high-fiber, low-fat, plant-based diet, the patients with Type I diabetes were able to reduce their insulin by an average of 40 percent within three weeks of changing their diet, and 24 of the 25 patients with Type II diabetes were able to stop taking their insulin altogether within weeks.<sup>[17]</sup>

## Eye diseases

They argue that studies show a diet that includes carotenoids, which are found in colorful vegetables, provide protection from macular degeneration, an eye disease that can cause blindness, and that a diet that includes lutein, a particular antioxidant found in spinach, provides protection from cataracts.<sup>[18]</sup>

## Heart disease and obesity

They say studies show that eating plant protein has a greater power to lower cholesterol levels than reducing fat or cholesterol intake.<sup>[15]</sup> At the time of their study, the death rate from coronary heart disease was seventeen times higher among American men than rural Chinese men.<sup>[19]</sup> They write that "the average calorie intake per kilogram of body weight was 30 percent higher among the least active Chinese than among average Americans. Yet, body weight was 20 percent lower." The authors add that "consuming diets high in protein and fat transfers calories away from their conversion into body heat to their storage form as body fat (unless severe calorie restriction is causing weight loss.)" They argue that "diet can cause small shifts in calorie metabolism that lead to big shifts in body weight," adding that "the same low-animal protein, low-fat diet that helps prevent obesity also allows people to reach their full growth potential."<sup>[20]</sup>

## Kidney stones

The consumption of animal protein is linked to risk factors for the formation of kidney stones. They state that increased levels of calcium and oxalate in the blood may result in kidney stones, and that recent research shows that kidney stone formation may be initiated by free radicals.<sup>[21]</sup>

## Osteoporosis

The authors state that osteoporosis is linked to the consumption of animal protein because animal protein, unlike plant protein, increases the acidity of blood and tissues. They add that to neutralize this acid, calcium (a very effective base) is pulled from the bones, which weakens them and puts them at greater risk for fracture. The authors add that "in our rural China Study, where the animal to plant ratio [for protein] was about 10 percent, the fracture rate is only one-fifth that of the U.S."<sup>[22]</sup>

## Reception

Dr. Wilfred Niels Arnold of the University of Kansas Medical Center reviewed the book in *Leonardo* in 2005. He praised its straightforwardness and accessibility, writing, "What makes this particular contribution exciting is that the authors anticipate resistant and hostile sources, sail on with escalating enthusiasm, and furnish a working hypothesis that is valuable. In fact, the surprising data are difficult to interpret in any other way."<sup>[23]</sup>

Professor Hal Harris of the University of Missouri–St. Louis recommended the book in 2006 in the "Summer Reading" section of the *Journal of Chemical Education*: "My introductory chemistry students have lots of questions related to their own nutrition, and *The China Study* is a book that I can recommend to them... The bottom line of this thoroughly-documented study is essentially that animal protein is not good for us—even milk, 'the perfect food.' My students (and I!) may not relish the change to a vegetarian diet, but it is difficult to refute the mass of evidence in *The China Study*."<sup>[24]</sup> Also in 2006, alternative medicine practitioners Daniel Redwood, D.C. and Norman Shealy M.D., Ph.D., wrote that the book is different from most other popular nutrition books by offering strong evidence-based explanations for its claims.<sup>[25]</sup>

Dr. Sanjay Gupta, CNN's chief medical correspondent, said in his documentary *The Last Heart Attack* in August 2011 that the book had changed the way people all over the world eat, including Gupta himself.<sup>[26]</sup>

In a written debate with Campbell in 2008, Dr. Loren Cordain, a professor at Colorado State University, argued that "the fundamental logic underlying Colin's hypothesis (that low protein diets improve human health) is untenable and

inconsistent with the evolution of our own species," and that "a large body of experimental evidence now demonstrates a higher intake of lean animal protein reduces the risk for gout, cardiovascular disease, hypertension, dyslipidemia, obesity, insulin resistance, and osteoporosis while not impairing kidney function." Campbell responded by questioning the implications of the evidence Cordain noted, and argued that "diet-disease associations observed in contemporary times are far more meaningful than what might have occurred during evolutionary times—at least since the last 2.5 million years or so."<sup>[27]</sup>

Harvard professors Frank B Hu and Walter Willett state in a letter to the editor in *American Journal of Clinical Nutrition* that the China study did not find a clear association between animal product consumption and risk of heart disease or major cancers,<sup>[28]</sup> although in an article, "Healthy eating guide", Professor Willett is encouraging people to choose plant-based proteins over animals-sources.<sup>[29]</sup> Willett is the principal investigator of the second Nurses' Health Study. As noted earlier, Campbell criticized the first Nurses' Health Study, calling it one of the chief sources of public misinformation about nutrition.<sup>[7]</sup>

### Notable followers of *The China Study* diet

American President Bill Clinton is a vocal supporter of *The China Study*, and is perhaps the most famous follower of the diet. In 2010, after years of heart issues, he undertook the diet, eating only beans, legumes, vegetables, and fruit, effectively living as a vegan.<sup>[1]</sup> In a short period he dropped 24 pounds, returning him to his college weight.<sup>[30]</sup>

### Notes

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## Further reading

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