

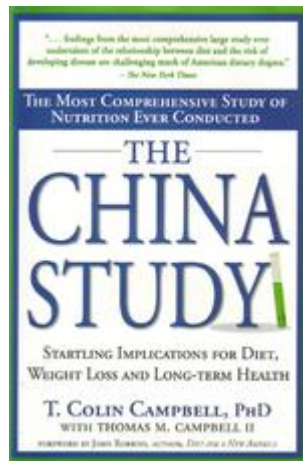
# ***The China Study* (book)**

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## ***The China Study: Startling Implications for Diet, Weight Loss, and Long-Term Health***



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*The China Study* is a 2004 book by [T. Colin Campbell](#) (the Jacob Gould Schurman Professor Emeritus of Nutritional Biochemistry at [Cornell University](#)), and his son, Thomas M. Campbell II, a physician. It examines the relationship between the consumption of animal products and a variety of chronic illnesses, such as cancers of the breast, prostate, and bowel; diabetes; and coronary heart disease.<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 that began in 1983 and was conducted jointly by the Chinese Academy of Preventive Medicine, Cornell University, and the [University of Oxford](#). T. Colin Campbell was one of the directors of the project, described by *The New York Times* in 1990 as "the Grand Prix of epidemiology".<sup>[3]</sup>

The study examined mortality rates from 48 forms of cancer and other chronic diseases from 1973–75 in 65 counties in China, and correlated them with 1983–84 dietary surveys

and bloodwork from 6,500 people, 100 from each county. It concluded that counties with a high consumption of animal-based foods in 1983–84 were more likely to have had higher death rates from "Western" diseases as of 1973–75, while the opposite was true for counties that ate more plant foods in 1983–84. The study was conducted in those counties because they had genetically similar populations that tended, over generations, to live in the same way in the same place, and eat diets specific to those regions.<sup>[4]</sup>

The authors conclude that people who eat a plant-based/[vegan](#) diet—avoiding [animal products](#) such as beef, pork, poultry, fish, eggs, cheese, and milk, and reducing their intake of processed foods and refined [carbohydrates](#)—will escape, reduce, or reverse the development of chronic diseases. They also recommend adequate amounts of sunshine to maintain sufficient levels of [vitamin D](#), and [supplements](#) of [vitamin B12](#) in case of complete avoidance of animal products. They criticize [low-carb diets](#), such as the [Atkins diet](#), which include restrictions on the percentage of [calories](#) derived from complex carbohydrates.<sup>[5]</sup>

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## Arguments and evidence

### Misinformation about nutrition

The authors argue 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](#). They write that those industries "do everything in their power to protect their profits and their shareholders."<sup>[6]</sup>

They 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>[7]</sup> They 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>[8]</sup>

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

The authors describe their eight principles of food and health:

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.<sup>[9]</sup>

## **Background to the China-Cornell-Oxford Project**

The China-Cornell-Oxford Project—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>

The idea for the study began in 1980-81, during discussions between T. Colin Campbell at his laboratory in Cornell and Chen Junshi, Deputy Director of Institute of Nutrition and Food Hygiene at the Chinese Academy of Preventive Medicine. They were later joined by [Richard Peto](#) of the University of Oxford – Professor of Medical Statistics and Epidemiology as of 2012 – and Li Junyao of the China Cancer Institute.<sup>[4]</sup>

In 1983, two villages were chosen at random in each of 65 rural counties in China and 50 families were chosen at random in each village. The dietary habits of one adult member of each family were examined – half male, half female – and the results compared to the death rates in those counties from around 48 forms of cancers and other diseases during 1973-75.<sup>[4]</sup>

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

The 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, using 1973-75 death rates. The study collected diet and lifestyle variables (ignoring all other factors) from inhabitants of the same counties approximately 10 years later, and found that, as [blood cholesterol](#) levels rose, so did the prevalence of "Western" diseases recorded in those counties in 1973–75.<sup>[10]</sup>

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, the authors write that cancers of the liver, rectum, colon, lung, breast, childhood and adult 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>[10]</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>[11]</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>[12]</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>[13]</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>[14]</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>[15]</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>[16]</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>[17]</sup>

### Cancer

The authors link [breast cancer](#) to the long-term exposure to higher concentrations of [female hormones](#), which in turn is associated with early [menarche](#) (age at first [menstruation](#)), late [menopause](#), and a high concentration of blood cholesterol. They argue that all these risk factors are linked to a diet high in animal protein, particularly [casein](#) from cow milk. The average Chinese woman is exposed to 35–40 percent of the lifetime [estrogen](#) exposure of the average British or American woman, and the rate of breast cancer among Chinese women is about one-fifth of the rate among Western women.<sup>[18]</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>[14]</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>[19]</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>[20]</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>[17]</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>[21]</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>[22]</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>[23]</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>[24]</sup>

## Reception

Dr. Wilfred Niels Arnold, professor of biochemistry at the [University of Kansas Medical Center](#), reviewed the book in [Leonardo](#) in 2005, praising its straightforwardness and accessibility:

Any serious challenge to the "American Diet" is bound to elicit some academic, public, and food industry opposition, which will range from mild skepticism through agitated re-evaluation to bitter disdain. 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>[25]</sup>

Professor Hal Harris of the University of Missouri–St. Louis's Department of Chemistry and Biochemistry recommended the book in 2006 in the "Summer Reading" section of the [Journal of Chemical Education](#): "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>[26]</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>[27]</sup>

[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>[28]</sup> American President [Bill Clinton](#) became a vocal supporter of *The China Study*. In 2010, after years of living with heart disease, 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>[29][30]</sup>

## Criticism and controversies

Professors Frank B Hu and Walter Willett of the Department of Nutrition, Harvard School of Public Health, wrote in a letter to the editor in 2000, in the *American Journal of Clinical Nutrition*, that the China-Cornell-Oxford Project did not find a clear association between animal-product consumption and heart disease or major cancers,<sup>[31]</sup> although in 2010, in an article, "Healthy eating guide," Willett encouraged people to choose plant-based proteins over animal sources.<sup>[32]</sup> Willett is the principal investigator of the "Nurses' Health Study II" (established 1989). Campbell is highly critical of the first [Nurses' Health Study](#) (established 1976), calling it one of the chief sources of public misinformation about nutrition.<sup>[8]</sup>

In a written debate with Campbell in 2008, [Loren Cordain](#), a professor in the Department of Health and Exercise Science 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>[33]</sup>

## See also

- [Neal D. Barnard](#)
- [Caldwell Esselstyn](#)
- [Michael Greger](#)
- [John A. McDougall](#)
- [Dean Ornish](#)
- [Physicians Committee for Responsible Medicine](#)
- [Vegan cuisine](#)
- [Vegetarian cuisine](#)
- [Vegetarian nutrition](#)
- [Vegetarianism in China](#)

## Notes

1. <sup>^</sup> <sup>[a](#)</sup> <sup>[b](#)</sup> Sherwell, Philip. "[Bill Clinton's new diet: nothing but beans, vegetables and fruit to combat heart disease](#)", *The Daily Telegraph*, October 3, 2010.
2. <sup>^</sup> Parker-Pope, Tara. "[Nutrition Advice From the China Study](#)", *The New York Times*, January 7, 2011.
  - Also see Bittman, Mark. "[Tough Week for Meatless Monday](#)", *The New York Times*, June 29, 2011.
3. <sup>^</sup> <sup>[a](#)</sup> <sup>[b](#)</sup> Brody, Jane E. "[Huge Study Of Diet Indicts Fat And Meat](#)", *The New York Times*, May 8, 1990.
4. <sup>^</sup> <sup>[a](#)</sup> <sup>[b](#)</sup> <sup>[c](#)</sup> "[China-Cornell-Oxford Project](#)", Cornell University, accessed March 31, 2012.
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5. [^ Campbell, T. Colin, and Campbell, Thomas M. \*The China Study: The Most Comprehensive Study of Nutrition Ever Conducted and the Startling Implications for Diet, Weight Loss and Long-term Health\*. BenBella Books, 2006.](#)
6. [^ Campbell 2004, pp. 249–250.](#)
7. [^ Campbell 2004, p. 269ff.](#)
8. [^ <sup>a</sup> <sup>b</sup> Campbell 2004, p. 272.](#)
9. [^ Campbell 2004, pp. 223–240.](#)
10. [^ <sup>a</sup> <sup>b</sup> Campbell 2004, p. 69ff, particularly pp. 78–79; also see <http://books.google.com/books?id=KgRR12FORPAC&pg=PA21> p. 21.](#)
11. [^ Campbell 2004, p. 78.](#)
12. [^ Campbell 2004, p. 80.](#)
13. [^ Campbell 2004, p. 242.](#)
14. [^ <sup>a</sup> <sup>b</sup> Campbell 2004, pp. 92–93.](#)
15. [^ Campbell 2004, pp. 187–194.](#)
16. [^ Campbell 2004, pp. 198–200, 361–368.](#)
17. [^ <sup>a</sup> <sup>b</sup> Campbell 2004, pp. 218–219.](#)
18. [^ Campbell 2004, pp. 87–88.](#)
19. [^ Campbell 2004, pp. 151–152.](#)
20. [^ Campbell 2004, pp. 214–216.](#)
21. [^ Campbell 2004, p. 80.](#)
22. [^ Campbell 2004, pp. 99, 101–102.](#)
23. [^ Campbell 2004, pp. 212–214.](#)
24. [^ Campbell 2004, pp. 205, 208.](#)
25. [^ Arnold, Wilfred Niels. "The China Study". \*Leonardo\*. Retrieved August 29, 2011.](#)
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## Further reading

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