



## Introduction

I am Travis, and my background is one of a concerned person, passionate about the scientific literature, and enthusiastic about shedding light on diet and health with readers of the McDougall Newsletter. [In this article](#) I explore how advocates of low-carb diets (such as Paleo, Primal, and Atkins-type diets) have grossly misrepresented the medical literature and the diets of healthy traditional populations in Asia. I also examine how advocates of fad diets have unfairly demonized wheat, which has been used as a staple by many healthy populations throughout the world. Furthermore, I present evidence showing how their dangerous dietary recommendations for consuming unlimited quantities of animal foods, regardless of whether pasture raised or factory farmed, can increase the risk of many of the leading causes of disability and death in the modern world.

You can read more of my work about the dangers of low-carbohydrate diets in the [September](#) and [October 2012](#), and the [February](#) and [May 2013](#) McDougall newsletters.

## The Asian Paradox: End of the Line for Low Carb Diets?

The fact that the populations of many parts of Eastern and Southeast Asia have traditionally been slim while consuming a high carbohydrate diet, typically rich in white rice is often considered as a 'Asian Paradox' by advocates and followers of carbohydrate restricted Low-Carb, Paleo and Primal type diets who hypothesize that such a dietary pattern promotes weight gain. Mark Sisson, a prominent Paleo diet advocate recently explained that the so-called 'Asian Paradox' is not a paradox because he believes that Asians have traditionally conformed to a lifestyle and diet that is comparable with his recommendations.<sup>[1](#)</sup>

Sisson attributes the leanness and health of the traditional living Asians to regular exercise and a diet rich in unprocessed foods including fresh meat, offal, bone broth as well as vegetables, with rice playing a neutral role. In addition, Sisson attributes much of the observed increases in rates of obesity, diabetes and coronary heart disease in Asia in more recent years to an increased intake of sugar, and the replacement of rice with wheat and saturated animal fats with omega-6 rich fats. However, Sisson provided scant evidence to support his claims regarding the composition of traditional and modern diets in Asia. Considering that obesity, diabetes and cardiovascular disease are major causes of disability and death throughout the world, this warrants an examination of these claims.<sup>[2](#)</sup>

## Concerns of Low-Carb and Paleo Diets

Sisson advocates a diet that is rich in animal protein and fat and poor in carbohydrate. Sisson has an 80/20 rule which allows 20% of dietary intake from non-Paleolithic foods from his list of approved foods, including items such as full-fat dairy, chocolate, coffee and wine, as well as the supplements that he sells. Sisson would have his targeted audience believe that humans have conveniently adapted to many foods that were not typically available during the Paleolithic period which are popular among followers of low-carb diets, but not the foods that they typically shun. As such a dietary composition is probably not coincidentally all that different from other popular carbohydrate restricted diets, this makes the diet that Sisson promotes essentially in one variant or another a rebranded Atkins diet. Aside from the lack of originality, there is an ever-increasing amount of evidence demonstrating harm of such a diet.

It is well established that weight loss has a modest favorable effect on many cardiovascular risk factors.<sup>[3](#) [4](#) [5](#)</sup> Therefore the modest beneficial changes to cardiovascular risk factors observed in participants on carbohydrate restricted diets in some controlled trials can be either partly or wholly explained by weight loss. However, even in the presence of slightly greater weight loss, meta-analyses of randomized controlled trials have found that compared to diets



Mark Sisson sells whey protein, among many other supplements. These supplements were certainly not available to Paleolithic humans.

rich in nutrient poor, [low-fiber carbohydrates](#), carbohydrate restricted diets raise LDL cholesterol and impair flow-mediated dilatation, a measure of endothelial dysfunction which can increase the risk of cardiovascular disease.[6 7](#) In addition, a recent intervention study on a Paleo type diet that contrary to previous intervention studies, did not focus on reducing saturated fat intake found that a Paleo diet significantly raised non-HDL cholesterol and the total cholesterol/HDL ratio despite weight loss and adherence to an exercise regime.[8](#)

The findings of a harmful effect on flow-mediated dilatation are consistent with several other controlled experiments which found that diets rich in [saturated fat](#), including when consumed in a carbohydrate restricted diet impaired flow-mediated dilatation.[9 10 11 12 13](#) These findings are also supported by experiments showing that diets rich in cholesterol and saturated fat cause endothelial dysfunction in numerous species of nonhuman primates.[14 15 16](#) Taken together, these findings lend support to the findings that carbohydrate restricted diets adversely affect coronary blood flow, arterial wall function and cardiac efficiency.[17 18 19](#)

The findings of a harmful effect on LDL cholesterol are consistent with the findings from hundreds of controlled experiments establishing beyond plausible doubt that a diet lower in saturated fat, ruminant trans-fat, dietary cholesterol, and richer in soluble fiber and plant sterols significantly reduces total and LDL cholesterol.[20 21 22 23 24 25](#) It has also been established beyond plausible doubt that lowering LDL cholesterol reduces the risk of coronary heart disease.[26](#) However, this effect is likely to be considerably stronger the longer LDL cholesterol is maintained at a lower concentration.[27 28](#)

A meta-analysis of 108 lipid intervention trials with 300,000 participants and a mean follow-up of only three years found that for each 1 mmol/l (38.7 mg/dl) reduction in LDL cholesterol, coronary heart disease and all-cause mortality was reduced by 24% and 15% respectively, independent of HDL cholesterol, triglycerides and non-lipid effects of specific interventions.[29](#) Comparatively, a meta-analysis of mendelian randomization studies with more than 312,000 individuals found that for each genetically predicted 1 mmol/l reduction in LDL cholesterol maintained throughout life, coronary heart disease was reduced by 55%, independent of the mechanism by which LDL was modified and other known risk factors.[30](#) Conversely, both randomized controlled trials and mendelian randomization studies have been unable to establish a causal relationship between HDL cholesterol and triglyceride concentrations and coronary heart disease.[29 31 32](#)

Experiments on animals have found that carbohydrate restricted diets accelerate the development of atherosclerosis independently of traditional risk factors.[33](#) Furthermore, evidence from thousands of experiments carried out over the last century have shown that the feeding of dietary cholesterol and saturated fat has accelerated the development of atherosclerosis in [virtually every vertebrate species](#) that has been sufficiently challenged. This includes mammalian, avian and fish species- herbivores, omnivores and carnivores, and over one dozen different species of nonhuman primates.

Nations throughout [Australasia, Europe and North America](#) have experienced very dramatic declines in coronary heart disease mortality throughout the last half century, for which a substantial portion of the decline has been explained by a dietary induced reduction in serum cholesterol.[34 35](#) After a decade of steady increases, the rates of coronary heart disease mortality in the Czech Republic and Poland fell almost immediately and halved within about 15 years following the abolishment of communist subsidies on meat and animal fats after the collapse of the Soviet Union. Nearly half of this decline has been explained by decreases in serum cholesterol.[36 37](#) In the Nordic nations the rate of coronary heart disease mortality decreased by about 50-85% within three decades following Government initiatives which included a reduction in saturated fat intake. In Finland, Iceland, Norway and Sweden

the decreases in serum cholesterol was the main contributor explaining between about one-third and more than half of this decline.[38 39 40 41](#)

Contrasting trends have however been observed in Tunisia and Beijing. Tunisia has recently experienced a significant increase in coronary heart disease mortality, of which half of this increase has been explained by an increase in serum cholesterol following a transition from the traditional wheat based diet to a diet richer in animal protein and fat.[42](#) In Beijing where the rates of coronary heart disease mortality increased by more than 100% between 1984 and 1999, the great majority of the increase was explained by an increase in serum cholesterol following a five-fold increase in intake of meat and [eggs](#) (Fig. 1).[43](#)

Over the last decade the population of Sweden has been shifting to a diet lower in carbohydrate and higher in fat, especially from animal sources following much positive media support for low carbohydrate-high-fat (LCHF) diets. However, despite promises of rapid weight loss, not only has there been no change to the constant increase in BMI, there has actually been an increase in serum cholesterol despite an increased use of cholesterol lowering medication.[44](#)

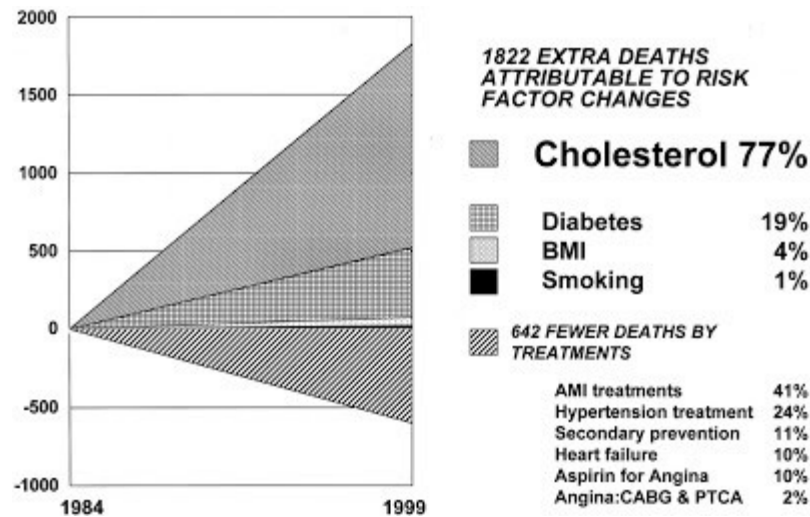


Figure 1. Coronary heart disease mortality trends in Beijing 1984 to 1999

Following the dietary transition in Sweden there has been a sudden surge in heart attacks in women, and stroke in men and women aged 35-44 despite steady decreases in smoking prevalence in this age group, especially for women.[45](#) This has been a great cause of concern for a number of prominent Swedish cardiologists who have attributed this to the significant increase in the popularity of LCHF diets.[46](#) Similar concerns were raised when there was a sudden surge in sudden cardiac death among women, also aged 35-44 in the United States during the period of heightened popularity of the Atkins diet.[47](#) [48](#)

As younger adults are considerably less likely to be treated for risk factors prior to a cardiovascular event, they may be more vulnerable to these dietary changes, possibly explaining why they have been the first group in the Swedish population to experience these adverse effects following the dietary transition. The finding that particularly young women were adversely affected may be because young women were among the first groups in the population to make this dietary transition, and also because LCHF diets are considerably more popular among Swedish women than men.[44](#) [49](#)

Another concern with diets that are rich in meat and offal is an excess intake of heme iron, found exclusively in animal tissue. As iron is a pro-oxidant and excess iron cannot be excreted from the body, excessive absorption of iron can contribute to progressive inflammatory and degenerative diseases.[50](#) It has been shown in controlled feeding experiments that the absorption of heme iron is considerably less regulated than that of non-heme iron, and therefore a high intake can lead to excess iron absorption.[51](#)

Recent meta-analyses of prospective cohort studies found that an increment of 1 mg/day of heme iron was associated with a 11%, 16% and 27% increased risk of colorectal cancer, type II diabetes and coronary heart disease respectively.[52](#) [53](#) [54](#) When taking into consideration the fact that diets very rich in meat and offal can supply well over 10 mg of heme iron per day, these findings cast considerable doubt on the long-term safety of such diets.[55](#) Heme iron intake has also been associated with oxidative stress and an increased risk of [stroke](#), gestational diabetes, gallstones and cancers of the prostate, lung, stomach, esophagus, endometrium and kidneys.[56](#) [57](#) [58](#) [59](#) [60](#) [61](#) [62](#) [63](#) [64](#) [65](#) [66](#) [67](#) [68](#) [69](#)

It has been shown in a randomized controlled trial that carbohydrate-restricted diets promote metabolite profiles that may increase the risk of colorectal cancer.[70](#) This is compatible with the strong evidence from both controlled experiments and prospective cohort studies that diets [richer in heme iron and poorer in dietary fiber](#) increase the risk of colorectal cancer. Over a century ago, high rates of cancer were observed in Argentina which was inhabited by the [Gaucho](#), a nomadic population that for months subsisted entirely on pasture raised beef. Similarly, a study carried out in Uruguay where livestock is predominantly grass fed, and the administration of hormones is banned by law found that a high intake of fresh red meat was associated with between a 87% and 290% increased risk of 13 different major cancers, independent of other food groups.[71](#)

Another concern of diets rich in animal protein is that they can have adverse effects on phosphorus balance in the presence of declining kidney function, contributing to very serious complications associated with kidney disease including cardiovascular disease and sudden death.[72](#) A Cochrane review of randomized controlled trials with patients with chronic kidney disease found that compared to patients with unrestricted protein intake, patients who restricted protein intake had a 32% lower risk of kidney death.[73](#) These findings are particularly concerning when considering that the prevalence of chronic kidney disease is estimated to be between 8-16% with a approximately 735,000 deaths attributed to chronic kidney disease worldwide in 2010 alone.[74](#) [75](#) Even in de-

opened nations a significant portion of chronic kidney disease cases go undetected.[76](#)

The potential harm of animal protein on kidney function is evidently only in part explained by the high phosphorus content. For example, it has been shown in several randomized controlled trials in patients with declining kidney function that even when protein and phosphorous intake is held constant, plant protein from grain and soy has a favorable effect on phosphorus balance and other markers of kidney function compared to animal protein.[77](#) [78](#) Consistent with these findings the Adventist Health Study 2 found that those who adhered to a vegetarian type diet had less than half the rate of kidney death compared to those who consumed meat regularly.[79](#)

Low-carb and Paleo type diets are often advocated as a means of weight loss. However, consistent with the long-term trends in Sweden, randomized controlled trials have found that compared to diets rich in nutrient poor, low-fiber carbohydrates, carbohydrate restricted diets provide little benefit in terms of weight loss in the long-term.[80](#) [81](#) As it has been shown in randomized controlled trials that an increase in intake of dietary fiber has favorable effects on body weight and a number of other cardiovascular risk factors, this suggests that had these trials focused on high-fiber carbohydrate rich diets, carbohydrate restricted diets would have been less likely to have compared favorably.[82](#) [83](#) [84](#) [85](#) Recently Don Matesz published an [informative critique](#) of the Paleo diet as a measure for weight loss. Notably Matesz mentions:

Consequently, any Paleolithic humans who engaged in nutritionally motivated hunting would have done so in order to increase their food energy intake in order to maintain or gain weight, not in order to achieve weight loss... In view of this, the "Paleo diet" theory that overfed sedentary modern humans who need to lose excess adipose should regularly eat the fatty flesh and eggs found in supermarkets because active, underfed, extremely lean prehistoric people who struggled to meet their basic caloric needs ate lean game flesh or eggs whenever possible lacks basic credibility.

Considering the evidence it is not surprising that many of the prominent [proponents of Low-Carb and Paleo diets](#) who unlike Sisson have not partaken in caloric restriction have gained considerable amounts of weight while adhering to such diets.

Recently a meta-analysis of prospective cohort studies with more than 272,000 participants found that carbohydrate restricted diets was associated with a 31% increased risk of death from any cause.[86](#) Sub-analyses suggested that carbohydrate restricted diets based on animal protein and fat was associated with an even stronger risk of death from any cause as well as death from cardiovascular disease. This was despite the evidence that animal protein and fat was primarily compared to refined rather than high-fiber carbohydrates, and there is data from [over one million people](#) in cohort studies demonstrating that dietary fiber and whole grain intake is associated with a significantly reduced risk of death from any cause. Although this meta-analysis was based on observational evidence, the above mentioned evidence from randomized controlled trials provides confidence for the validity of these findings, as do other lines of evidence cited previously.

Considering the lack of evidence when compared to healthy alternatives of a significant long-term favorable effect on body composition and strong evidence of harm, especially when animal sources of protein and fats are chosen, there is little rational to promote these fad diets.

## Meat as a Staple in Asian Diets

The evidence that Sisson provides to suggest that traditional Asian diets were rich in meat and offal is based on his observations of Chinese, Japanese, Korean, Thai and Vietnamese restaurants and Asian supermarkets in modern day United States. However, the food balance sheets from the United Nations for the early 1960s for these nations that Sisson makes special reference to, suggest that total animal food intake only amounted to between 2.5% and 10% of total caloric intake, with offal intake being almost non-existent.[87](#) As earlier dietary surveys, especially prior to World War II suggest that intake of animal foods was even lower, this casts significant doubt on Sisson's suggestion that animal foods traditionally contributed to a large portion of these populations diets.[88](#) [89](#)



Traditional Kirghiz nomadic pastoralists

Perhaps if Sisson would only visit a Mongolian Barbeque restaurant he would observe a meaty diet that is not only largely comparable with his recommendations, but also with the traditional diet of the nomadic pastoralists of Mongolia, Central Asia and north-



ern China. It has been observed however that many of these nomadic populations who subsist largely on pasture raised animal foods have high rates of obesity and cardiovascular disease, and this has been frequently associated with their meaty diets.[90](#) [91](#) [92](#) Some of these observations were made at least as far back as ninety years ago.

In the 1920s, it was observed that the nomadic pastoralists of the [Kirghiz and Dzungarian Steppes](#) in Central Asia and northern China subsisted almost exclusively on enormous amounts of fermented mare's milk and meat from pasture raised animals. Not only was a high rate of obesity observed, but also high rates of premature atherosclerosis, contracted kidney, apoplexy, arcus senilis, and gout. These pastoralists were often observed to suffer from complications related to cardiovascular disease even in their early thirties. In contrast, their urban counterparts who based their diet on soup, bread, pickles, and potatoes with very little meat were observed to be slim, free of cardiovascular disease and had very good health, even into their seventies when they were still sexually active.

It was observed that in the 1960s the rates of coronary heart disease of the nomads from Xinjiang in northern China who largely subsisted on pasture raised animal foods was more than 7 times higher than that of other populations both within Xinjiang and throughout China which had a much lower intake of animal fat.[93](#) These findings from non-industrialized populations in Asia are compatible with the observations of a high rate of cardiovascular disease among the Inuit populations whose staple is marine animals.[94](#) In 1940, based on years of clinical practice and reviewing medical reports, [Bertelsen](#), who is considered the father of Greenland epidemiology stated in regards to the mortality patterns among the Greenland Inuit that:

...arteriosclerosis and degeneration of the myocardium are quite common conditions among the Inuit, in particular considering the low mean age of the population.

It is clear that these populations who traditionally subsisted predominantly on large amounts of naturally raised animal foods that the Low-Carb and Paleo proponents such as Sisson promote are not a good role model of health.

## Wheat as a Staple in Asian Diets

There had been a considerable amount of research carried out in regards to diet and the health of populations within the greater Asia region that consumed a semi-vegetarian diet based largely on wheat. Examples include the Arab Bedouins and Yemenite Jews, both of which traditionally consumed on average more than 500 grams of bread per day.[95](#) These populations are known for their exceptionally low rates of coronary heart disease and obesity when following their traditional wheat based diet. Perhaps the largest consumers of wheat that there is considerable data available for are the Bedouins from southern Israel. The great majority of the dietary intake of the traditional Bedouins comes from wheat, typically in the form of full-grain bread, which is especially the case for the poor who eat very little else. It was estimated that the Bedouins traditionally consumed on average 750 gm, or the equivalent of 25 slices of full-grain bread per day.[95](#)



Unleavened bread, the traditional Bedouins predominant source of food

The traditional Bedouins had many dietary traits besides an extremely high intake of whole-grain wheat that are considered by advocates of Low-Carb and Paleo diets as being primary causes of obesity and the so-called 'diseases of civilization', including diabetes and coronary heart disease. For example sugar intake was observed to be modestly high, a trait comparable to that of the populations in Colombia, Cuba and Venezuela who have traditionally had among the highest rates of per capita sugar consumption in the world and low rates of coronary heart disease mortality.[96](#) [97](#) It was estimated that dietary cholesterol intake was only 53 mg/day and saturated fat was less than 3% of caloric intake, suggesting that animal foods as a whole contributed very little to the Bedouins diet. Meat was consumed only about once per month, and virtually never eaten by the poor. Similarly egg and especially fish intake was very infrequent, although animal milk is frequently consumed. Fat intake only contributed to about 11% of total caloric intake, with a relatively low intake of omega-3 fat and a high ratio of omega-6/omega-3 fat. Vitamin A intake was very low, and for the many women who virtually never exposed their skin outside, blood concentrations of vitamin D would have likely been on the low side.[96](#)

It has been documented that diabetes and heart attacks were all but entirely absent in the traditional living Bedouins which had an

average serum cholesterol of 4 mmol/l (155 mg/dl), and that the great majority of the population were exceptionally lean by western standards, both in terms of weight and skin thickness.[96 98](#) The rates of inflammatory bowel disease were also considered to be very low.[99](#) The few Bedouins that were observed to be obese were exclusively the wealthier elderly who rarely even walked. Being a semi-nomadic population that largely relied on walking as a means of transport, exercise has been suggested as one explanation for their exceptional low rates of obesity. However, many of the women were forced to stay inside their tents all day allowing for little exercise, yet these women with almost no exceptions were slim and free of vascular disease.[96](#)

Researchers believe that it is the Bedouins small appetite that partly contributed to their exceptional leanness.[96](#) Considering that about 90% of caloric intake was derived from full-grain wheat suggests that the wheat consumed was not a low satiety food, nor was it fattening. This hypothesis is consistent with the findings from a recent review of 38 epidemiological studies that found suggestive evidence that whole-grain bread intake favorably influences body weight.[100](#) Similarly, a number of controlled experiments found suggestive evidence that wheat bread assists with satiety and weight loss in low-calorie diets.[101 102 103](#) In addition, a recent large systematic review found that whole-grain cereals and bread are associated with a significantly decreased risk of colorectal cancer, type 2 diabetes and cardiovascular disease.[104](#)

One clear downside of the Bedouins traditional diet was a very low intake of fruits and vegetables. Although an increased intake of fruits and vegetables would likely have helped to prevent a number of potential vitamin deficiencies and improved overall health, it is clear that the traditional Bedouins were very slim and had very low rates of diabetes and heart disease despite consuming a diet that Sisson considers as a primary cause of diseases of civilization.

Sisson referred to an article from a blogger, Ned Kock who analyzed the data from the China Study II with minimal control for con

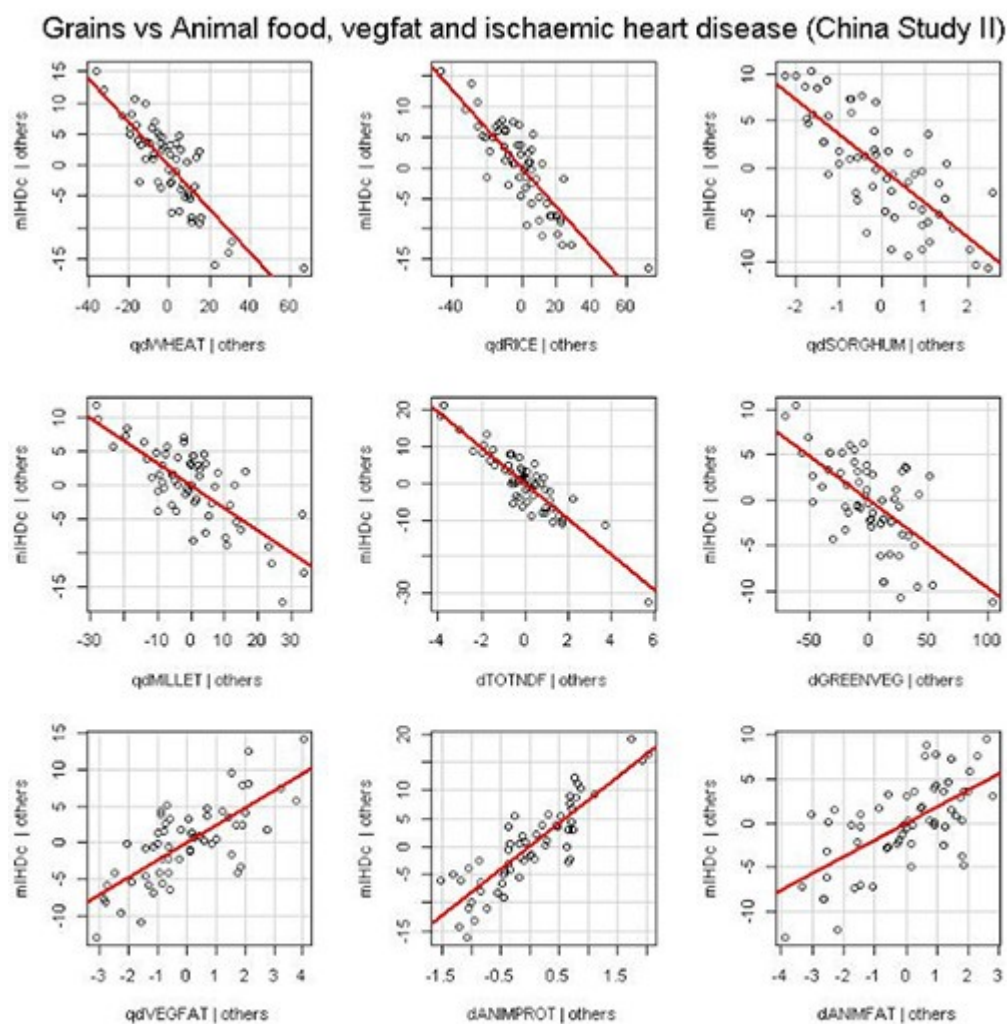


Figure 2. Various foods and nutrients and risk of ischemic heart disease in a multivariate regression analysis in the China Study II, ages 35-69

founding factors and found a positive association between wheat flour intake and cardiovascular disease mortality. However, Michel Blomgren, a statistics enthusiast who conducted a much more comprehensive analysis found that intake of wheat and a number of other staple grains were associated with a decreased risk of ischemic heart disease mortality.<sup>[105](#)</sup> The opposite was found for animal protein and both animal and vegetable fat (Fig. 2).

Although these findings may contrast the more simple analyses produced by people like Ned Kock and [Denise Minger](#), the greater consistency with [other ecological studies](#), as well as other lines of evidence described previously does provide some confidence for the validity of these findings.<sup>[106](#) [107](#)</sup> This is not to say that this analysis is without its limitations, nor to say that an analysis with a similar degree of control examining all causes of cardiovascular disease mortality would not be more informative. However, when considered together with all other lines of evidence, this suggests that a modest intake of whole-grain wheat can be part of a health promoting diet for most people. These contrasting findings may not be considered to be all that surprising when considering that animal food intake was very strongly associated with favorable socioeconomic factors, with household income explaining up to 80% of the variance of intake between counties. Such favorable socioeconomic factors were not typically enjoyed in those counties with higher intakes of wheat, which would inevitably have had an unfavorable influence on cardiovascular disease mortality.<sup>[108](#)</sup>

In the [China Study](#), a higher wheat intake can probably be considered as a marker of a higher concentration of certain ethnic groups, such as those from Central Asia living in northern China. Without specific data on the ethnic breakdown of each county, this makes it difficult to determine how ethnicity may have impacted these findings. However, a number of studies examining people within some of the major ethnic groups living in northern China have investigated the association between dietary factors and obesity and other cardiovascular risk factors. For example, a study found that within several ethnic groups living in Xinjiang, the region with the highest average BMI in the China Study and home to a number of nomadic populations, meat intake was associated with an increased risk of obesity, consistent with studies carried out in other regions of northern China.<sup>[90](#) [109](#)</sup>

Although it is clear that a small portion of the population, such as those with celiac disease will benefit from eliminating wheat from their diet, there is no need to resort to making up nonsense as Low-Carb and Paleo diet advocates such as Sisson and Wheat Belly author William Davis have done about whole-grain wheat being a primary cause of obesity and diseases of civilization. The idea that whole-grain wheat should be replaced with fatty meats and [eggs](#) is clearly a step in the wrong direction, and there are certainly better alternatives for people who cannot tolerate wheat.

## What is the evidence?

The assertion that the populations of Eastern and Southeast Asia were traditionally slim and healthy while consuming a high carbohydrate diet is somehow a paradox suggests that populations in other parts of the world have not thrived on a high carbohydrate diet. Such a suggestion ignores the evidence from [healthy populations all throughout the world](#).

As Sisson correctly pointed out, there has been a surge in the rates of obesity, diabetes and other chronic diseases in Asia in recent decades (Fig. 1). However, replacement of the traditionally consumed carbohydrate rich foods with animal foods has not appeared to have had a beneficial effect on the trends of such chronic and degenerative diseases in these nations, and the evidence strongly suggests that they have likely contributed to the increase of them. Although Sisson's emphasis on increasing exercise and reducing the intake of refined carbohydrates are welcoming, the assertion that healthy diets can be rich in animal protein and fat, particularly of the saturated kind is clearly in disagreement with a century of accumulated research demonstrating harm of such a diet.

For more information about the dangers of Low-Carb, Paleo and Primal type diets, please refer to the [June 2012](#) and [January 2013](#) McDougall newsletters.