

## **Blood Type Diet Tutorial**

### **Is this diet right for you?**

You may have heard about the diet from a friend or relative, or read about the Blood Type Diet in one of the popular magazines. Many people try the Blood Type Diet in the hopes of enhancing their overall health or fighting a particular disease. Many use the diet as a way of achieving their ideal weight. These are all very good reasons as over the years many people have used the Blood Type Diet to accomplish these goals.

On many of the web pages and forums you will see the Blood Type Diet referred to as the 'BTD' or 'ER4YT', an older acronym that stands for Eat Right 4 Your Type, the name of Dr. D'Adamo's first book. No matter, both abbreviations stand for the Blood Type Diet.

### **Key Point:**

The blood type diet is quite effective, as measured by the large numbers of individuals who have reported their results. Interestingly roughly 8 out of 10 individuals report a positive result from following the program, which is especially interesting in light of the fact that each of the four blood groups has quite different diets. What does that say about the wisdom of 'one-size-fits-all' diets?

According to Dr. Peter D'Adamo, author of 'Eat Right for Your Type', a chemical reaction occurs between your blood and the foods you eat. This reaction is part of your genetic inheritance. This reaction is caused by a factor called Lectins. Lectins, abundant and diverse proteins found in foods, have agglutinating properties that affect your blood. So when you eat a food containing protein lectins that are incompatible with your blood type antigen, the lectins target an organ or bodily system and begin to agglutinate blood cells in that area. Different lectins target different organs and body system.

Fortunately, most lectins found in the diet are not quite so life threatening, although they can cause a variety of other problems, especially if they are specific to a particular blood type. For the most part your immune systems protect you from lectins. Ninety-five percent of the lectins you absorb from your typical diets are sloughed off by the body. But at least five percent of the lectins you eat are filtered into the bloodstream and different reactions in different organs.

Your blood type diet is the restoration of your natural genetic rhythm. Your blood type diet works because you are able to follow a clear, logical, scientifically researched plan based on your cellular profile. Each food groups are divided into three categories:

- Highly beneficial (food that acts like Medicine),
- Foods allowed (food that does no harm to the blood type)
- Foods not allowed (food that acts like a Poison)

Below is a summary of the various Blood Type Diet and detail plan of each one according to Dr. D'Adamo.

Simpler List					
	Diet Profile	Allowed	Limited	Food to avoid for Weight Loss purpose	Food that help with Weight Loss
Type O	High Protein: Meat eaters	Meat fish vegetables fruit	grains beans legumes	wheat corn kidney beans navy beans lentils cabbage Brussels sprouts cauliflower mustard greens	kelp seafood salt liver red meat kale spinach broccoli
Type A	Vegetarian	vegetables tofu seafood grains beans legumes fruit		meat dairy kidney beans lima beans wheat	vegetable oil soy foods vegetables pineapple
Type B	Balanced omnivore	meat (no chicken)		corn lentil	greens eggs

		dairy grains beans legumes vegetables fruit		peanuts sesame seeds buckwheat wheat	venison liver licorice tea
<b>Type AB</b>	Mixed diet in moderation	meat seafood dairy tofu beans legumes grains vegetables fruits		red meat kidney beans lima beans seeds corn buckwheat	tofu seafood dairy greens kelp pineapple

Follow a diet that's designed specifically for your blood group and you'll lose weight, feel healthier and lower your risk of many diseases. At least, that's what Dr Peter D'Adamo, naturopath and creator of the Blood Type Diet claims in his book *Eat Right For Your Blood Type*.

While many might be a fan of the Blood Type Diet, most medical and nutrition experts are not, and agree that the theory is complete nonsense.

### So what is the theory?

Prepare to be blinded by science! Dr D'Adamo believes our blood group determines how our bodies deal with different nutrients. His theory is based on the idea that each blood group has its own unique antigen marker (a substance that the body recognises as being alien) and this marker reacts badly with certain foods, leading to all sorts of potential health problems. Furthermore, Dr D'Adamo believes that levels of stomach acidity and digestive enzymes are linked with your blood type. Consequently, he says, by following a diet designed specifically for your blood type, your body digests and absorbs food more efficiently, with the result that you lose weight.

But here is where the theory becomes even more weird and wonderful. Dr D'Adamo believes that because blood types evolved at different times throughout history, we should eat a diet based on the

types of foods our ancestors typically ate at the time when our blood type was first recognised!

### **When did the blood types evolve?**

Blood Group O was the first blood type to be identified, although how we know this is anyone's guess – we're talking about our hunter-gatherer ancestors who were around in 50,000 B.C! Nevertheless, Dr D'Adamo believes because our type O ancestors survived and thrived on a high-protein, meat-based diet, that is the type of diet blood group Os should follow in the 21st century.

Next came the emergence of blood type A, sometime around 15,000 B.C! By this time, our ancestors' hunter-gathering days were over and instead they started to settle into farming-type communities. The creation of blood type A around this time meant our ancestors did well on a vegetarian-based diet. And again, Dr D'Adamo recommends that blood group A's should today follow a veggie diet.

Blood type B supposedly evolved around 10,000 B.C thanks to our nomadic ancestors. They left their farms and started wandering the land, constantly moving from place to place. Consequently, Dr D'Adamo's theory goes, blood group B's today can get away with eating a varied diet that consists of most foods including meat, dairy, grains and vegetables.

Finally, came blood type AB, which evolved just 1,000 years ago! Dr D'Adamo thinks this blood type helped our ancestors make the transition to modern times. Meaning that people with blood group AB can eat a mixture of the foods suitable for both blood group A and blood group B.

### **That gives me a good idea, but can you be more specific about what you can and cannot eat?**

Each of the four blood types has a detailed list of foods that should be avoided and those that can be included. Here is the lowdown...

## **Blood Group O**

This is the most common blood group in the UK. Dr D'Adamo says that our digestive tract retains the memory of ancient times, and so type Os need to eat a typical hunter-gatherer type diet. In other words, type Os should follow a high-protein, low-carb diet with lots of meat and fish but no dairy products, wheat or grains.

If that sounds familiar, it's because it is – the diet recommended for people with blood type O is simply a variation on many of the typical high-protein, low-carb diets that are currently popular, such as the Atkins diet. Foods you can eat freely include meat, fish and olive oil; foods you can eat in moderation include eggs, nuts, seeds, certain vegetables and fruits; and foods to avoid include dairy products, beans, cereals, bread, pasta and rice. To complement your food intake, Dr D'Adamo recommends lots of vigorous aerobic exercise such as aerobics and running – just like our hunter-gatherer ancestors did!

## **Blood Group A**

This is the second most common blood type in the UK. Again according to Dr D'Adamo, digestive system is apparently very good at remembering that our ancestors had settled, farming lifestyles, which included eating lots of grains and vegetables but little meat. Consequently, blood type A's should follow a vegetarian diet but still avoid dairy products. This means nuts, seeds, beans, cereals, pasta, rice, fruit and vegetarian are all on the 'to eat' list. Meanwhile, calming exercises are thought to be best for blood type A's such as yoga or golf.

## **Blood Group B**

Only one person in 10 has blood type B – a real shame when you consider this blood group has the least dietary restrictions! As our type B ancestors were able to thrive on all sorts of foods, thanks to all that traveling, very few foods need to be avoided and this is the

closest you will get to a healthy, balanced diet from Dr D'Adamo. The only foods that need to be avoided are processed foods, although nuts and seeds are not recommended and only small amounts of carb-rich foods should be eaten. When it comes to exercise, Dr D'Adamo recommends activities that have mental component, such as hiking, tennis and swimming – clearly our ancestors did a lot of thinking while they were walking!

### **Blood Group AB**

People with this rare blood type should eat a combination of the foods recommended for blood groups A and B. Somewhat confusing when type B allows you to eat most foods, while type A suggests a vegetarian diet! Dr D'Adamo gets around this by suggesting that type ABs follow a veggie diet most of the time with some meat, fish and dairy products occasionally. It is the same when it comes to exercise too – blood type ABs should combine calming exercises with moderately intense activities.

### **What do the experts say?**

Medical experts universally agree that the theory is nonsense, and say there is absolutely no link between our blood group and the diet we eat. Consequently you will not find qualified nutritionists or dietitians recommending this diet.

There are also several concerns, namely that the diets recommended for blood groups O and A are considerably limited and cut out major groups of foods.

In the long term, this can result in a poor intake of nutrients needed for good health. Cutting out dairy products, for example, will lead to poor intakes of calcium, which can put you at risk of osteoporosis (brittle bone disease), while avoiding meat can result in low intakes of iron, which can lead to anaemia.

### **But will the diet help me lose weight?**

Almost certainly, but this is because each of the diets for the four blood types eliminates specific groups of food such as bread and cereals, dairy products or meat and fish. Dr D'Adamo does not give any indication about how much weight you will lose, it will depend on how much you restrict your food intake.

### **Are there any pros?**

There are not many positive things to say about this diet, which is clearly based on **science fiction** rather than **science fact**. However, as with any diet, it will get you thinking about what you are currently eating, with the result that you may start to make changes to your diet. Added to this, the blood type diet recommends eating fresh, natural foods and so can help you de-junk your diet by cutting out processed foods, takeaways, booze, chocolate and too many cups of coffee – all of which our ancestors missed out on!

### **The cons?**

There are plenty. On a practical level, you may need a blood test to discover your blood group if you do not already know it – and this will mean a trip to your local health centre! Mealtimes may also be impossible if everyone in the family wants to follow the diet, but has a different blood group! But most importantly, it is just another cranky way of getting people to cut calories – and the most worrying thing about this is that while you will probably lose weight, it could also affect your health in the long term. Nevertheless, if you are still adamant about giving it a go, it is best to follow it for just a short time (one week or less) and use it to kick-start a longer-term, healthy, weight-loss plan.

Nevertheless, based on Dr D'Adamo's theory, I am looking forward to the evolution of blood type F! People with blood type F will need lots of fast food, takeaways, pizza, sugary snacks, crisps and chocolate to remain in tune with their environment. After all, if the theory is correct, surely that is what we can expect, based on what many of us now eat in the 21st century!

Like many quacks before him, D'Adamo appealed to intuition for his brainstorm ("over the years, he recognized that each of the 4 blood types thrived on certain foods and physical activities") and anecdotes rather than controlled studies to support the validity of his ideas. His son, also a naturopath, Peter J. D'Adamo (about whom the rest of this entry is about) is an apple that did not fall far from the tree. He has written several books and travels the world promoting the blood type diet.

There is no reasonable scientific basis for the claim that blood type should determine one's diet, though Peter claims to have collected "over 1,000 scientific articles on blood types and their correlations to disease, biochemistry, nutrition, and anthropology."

Even so, he is never done a controlled study on blood type diets. Yet, he claims that blood type determines body chemistry to such an extent that those with type A blood should go vegetarian and meditate, those with type O should eliminate grains and do aerobics. He suggests similar nonsense for types B and AB.

D'Adamo hangs much of his theory on the action of lectins, proteins found on the surface of certain foods that can cause various molecules and some types of cells to stick together. He blames lectins for serious disruptions throughout the body, from agglutination of the blood cells to cirrhosis and kidney failure....

Since most people are unaware of their blood types, let alone what foods are "evolutionarily inappropriate" for them to eat, it is reasonable to assume that on most days most people eat the "wrong foods" for their blood type (e.g., Type O eating wheat, Type A eating meat, etc.). Thus, according to D'Adamo's theory, most everyone experiences repeated showers of agglutinated red cells throughout their bloodstream after most every meal - day after day, month after month, year after year. If the capillary beds in your heart, lungs, kidneys, brain, eyes, and other essential organs are subjected to barrage after barrage of agglutinated red cells, they will eventually

begin to clog up. These micro-areas of diminished blood flow would at first cause scattered, then more concentrated areas of tissue damage - with eventually many micro-infarctions scattered throughout these vital structures. The brain, heart, lungs, kidneys and adrenals would soon be irreparably damaged by these processes, resulting in potentially fatal outcomes in millions of people.

Such a syndrome of organ failures due to lectin-induced micro-infarctions of the brain, heart, kidneys, retinas, and adrenals would be well known to pathologists and other medical scientists. It would not be a subtle disease. In the pathology texts, there would be clear descriptions - complete with photographs taken through high-power, optical microscopes as well as electron microscopes - of damage from lectin deposits and blood agglutination in most major organ systems. The existence and intricacies of such a widespread disease would be as common knowledge among physicians and cell scientists as atherosclerosis is today. Yet, I am aware of no such descriptions in the pathologic literature. No pathologist I know has ever mentioned tissue infarction from lectin-induced red cell agglutination as a cause of any disease in humans.

Blood type has little to do with digestion or body chemistry. If you have blood group A, then you have got A antigens covering your red cells and anti-B in your plasma. Antigens are substances that evoke an immune response. Since people in blood group B have B antigens and carry anti-A in their plasma, type A blood should not be given to those in Group B, and vice versa. (Group O has neither antigen and group AB has some of each.) Furthermore, about 85% of us, regardless of blood type, carry the Rh antigen, while about 15% are Rh negative. About 90 to 95 percent of African Americans and 98 to 99 percent of Asians are Rh-positive. Also, since pathologist Karl Landsteiner identified the four blood groups early in the twentieth century, 276 discrete red-cell antigens have been discovered.

Maybe D'Adamo should have 276 discrete diets, one each for A+ and A-, B+ and B-, and so on.

Blood type is not totally benign. For many years, scientists wondered why type O's were more likely than other blood types to develop stomach ulcers or stomach cancer. In 1993, scientists found that ulcers were caused by helicobacter pylori, a bacterium which had a special affinity for one of the unique type O proteins. A geneticist at Oxford University who checked for other significant associations between the ABO blood types and the incidence of disease, reported that there were only seven; the relationships were often weak; and most, like ulcers, originated somewhere along the digestive tract. If the ABO blood type was that much of a key, as D'Adamo posits, these relationships would strong and plentiful.

Dr. Victor Herbert, a hematologist who studied blood and nutrition at New York's Mt. Sinai Medical Center before his death, once said of the theory linking blood type and diet that it is "pure horse manure. It has no relation to reality. The genes for blood type have nothing to do with the genes that handle the food we eat."

D'Adamo is not alone in this quackery about blood type, however. Obstetrician-Gynecologist Steven M. Weissberg, M.D., and Joseph Christiano, a personal fitness trainer, have co-authored *The Answer is in Your Bloodtype: Research Linking Your Blood Type to Life Span, Love and Compatibility, Your Likely Illness Profile, Diet and Exercise for Maximum Life* (1996). This pair claims that "You are what you eat, but you should EAT WHAT YOU ARE." This means each of us should eat the optimal diet compatible with our blood type." They have many anecdotes to support their beliefs.

Since the diets developed by Peter are not intrinsically harmful in general, it would be surprising if he could not find many satisfied customers willing to testify on his behalf. All he has to do is ignore all the cases he did not help with his diets to make his case seem stronger than it really is. Even a broken clock is correct twice a day.

Some of Peter D'Adamo's dietary advice could be harmful, however. As Dr. Klaper notes: "despite widespread knowledge that many non-

Caucasians are intolerant of dairy products due to the normal disappearance of lactase enzymes in their intestinal cells, D'Adamo recommends that Type B's of Asian descent may need to incorporate them (dairy products) more slowly into their diets as they adjust their systems to them." Lactase-deficient readers who follow this advice are likely to end up with "severe bouts of abdominal cramps and diarrhea."

Not content with limiting his pseudoscientific advice to matters of nutrition, D'Adamo claims that blood type affects personality and character. He offers what Dr. Klaper calls "blood type astrology."

In the book [*Eat Right for Your Type*], he tells flesh-eating Type O's that they have a "genetic memory of strength, endurance, self-reliance, daring, intuition, and innate optimism...", "the epitome of focus, drive...", "hardy and strong, fueled by a high protein diet" (is he describing a Type O "master race"?), while he paints the "more vegetarian" Type A as submissive tofu eaters, "biologically predisposed to heart disease, cancer and diabetes" (p. 97). He labels Type A's with personalities "...poorly suited for the intense, high-pressured leadership positions at which Type O's excel," (p.142), stating that, in pressure situations, people with Type A blood "tend to unravel" and "become anxious and paranoid, taking everything personally." Finally, on page 143, he saddles the group with the dark image of Adolph Hitler, "...a mutated Type A personality." D'Adamo's system seems to create "blood type astrology" ("What's your type? O Positive? Knew it! So am I!"). That imposes strange, limiting stereotypes on very complex human beings.

Finally, many people will no doubt swear by the blood type diet. For example, a vegetarian who eats a lot of wheat may find that D'Adamo's diet recommendations relieved her digestive problems and a host of other ailments. She may attribute her former problems to eating the wrong diet for a type O. However, many people with type O blood are vegetarians or eat wheat without having any digestive problems. On the other hand, some people have gluten

intolerance and some have colitis. Their doctors probably advise them not to eat wheat, regardless of blood type.

The practice of naturopathy as originally described by Dr. Benedict Lust includes “the elimination of...habits such as over-eating, alcoholic drinks and...meat eating” Dr. Lindlahr defined the philosophy of Nature Cure or naturopathy as favoring a “strict vegetarian diet” because of the “morbid nature” of the “alkaloids of putrefaction” which “every piece of animal flesh is saturated with”

The wise, health-promoting nutritional advice offered by the vegetarian doctors who defined naturopathy as well as the recent research detailing the benefits of vegan/vegetarian diet on our kind done by Pritikin & Ornish (heart), Wahlqvist and Aldercreutz (menopause), Lindahl (asthma), Barsotti (kidney disease), the Farm Collective (uncomplicated home births) and Chen, Peto et al (general health, cancer) is being ignored by naturopathic physicians who subscribe to the blood type diet theory.

We feel this is a mistake.

The foundation for the blood type diet theory is comprised of three “legs” as the author himself points out. As we read them the individual legs contain inaccuracies which render each one scientifically and logically flawed. The diet theory they support is, then, rendered invalid.

### **“Leg One” is the lectin hypothesis.**

The foods we eat contain lectins. Because of how lectins clump (or “agglutinate”) other molecules they have the capacity to create health problems for human beings. Botulism toxin has a lectin, ricin, that is so deadly you would never encourage someone to consume it. On page 27 of the book explaining the blood type diet, it is stated that certain lectins “agglutinate cells in the affected blood type” as “visible under the microscope”. The author assumes that this same clumping seen in office on a slide beneath a microscope occurs in the bodies of

people of particular blood type, making them unwell if they do not choose their foods as recommended by the blood type diet theory.

Extrapolating from results observed in a test done on a laboratory slide to effects in a human being has several disadvantages. Observed in vitro morphological changes in blood are controversial regarding their “validity and reproducibility” as well as “the most common criticism” that “the technique is susceptible to the subjective judgments of technicians and that the methods used by different labs produce widely varying results”

A laboratory slide differs significantly from the environment of the intestine. This is especially important when you realize that fasting or abstinence from alcohol will alter intestinal villus morphology and brush border membrane enzymes and that the combination of foods chosen at a meal will alter transport properties of individual nutrients due to changes in the composition of brush membrane lipids. These important changes in tissue, enzymes, absorption and transport at the intestinal tract will not be mirrored in a slide of blood taken from the arm or fingertip.

Additionally and perhaps most importantly, in response to in vivo challenge of the gastrointestinal tract with a food, human beings produce natural antibodies to dietary lectins such as soy, wheat and peanut. These antibodies do not interfere with the agglutination properties of the lectins but they are a significant part of our immune repertoire. The in vivo protection against any potential lectin-induced damage afforded by such antibodies is not quantifiable or apparently observable by in vitro microscopic analysis of agglutination, so an investigator or technician would miss it.

Analogously, if we saw a house ablaze in a section of a city with closely-packed homes without knowing there was a nearby and reliable fire department, we could erroneously assume that an entire block of homes would go up in flames. This is decidedly not the case in nearly every major metropolitan area. Similarly, conclusions drawn

about the impact of soy, peanut and wheat lectins from observed agglutination on a slide without knowing the extent of the innate protection our bodies generate in response to these lectins are most likely mistaken.

## **“Leg Two”**

This part of the blood type theory addresses the effect of foods on each blood type with regards to their interactions with intestinal bacteria and the mucous secretions of the gut (the largest source of blood type antigens other than red blood cells). This is referred to as the “polyamine part”.

Polyamines are chemicals which can be measured by a urine indican test. The urine indican test, as employed by conventional labs and some natural health doctors, does reflect bacterial activity in the small and large intestines. Elevated levels of urine indicans are considered, by some natural health care doctors, to be an indicator of “intestinal toxemia” and “overgrowth of anaerobic bacteria”.

The conditions which, according to Dirk Powell, N.D., are confirmed as resulting in elevated levels of urine indican are the following:

- inflammatory bowel disease
- celiac disease
- hypochlorhydria
- gastric ulcer
- biliary and intestinal obstruction,
- jejunal diverticulosis,
- scleroderma,
- gastrectomy
- Hartnup's disease
- pancreatic insufficiency
- diminished peristalsis
- blue diaper syndrome

Urine indican is recognized as valuable for detecting intestinal integrity, absorption and protein catabolism. It is possible to draw oblique conclusions about the impact of diet on colon health using the urine indican test.

The blood type diet theory hypothesizes, that the urine indican test “shows that a carcinogen entering your system is magnified to ninety times the effect of someone for whom it is not toxic”. There is no evidence that we could find which substantiates this remark. Also, there is evidence that enzymes such as intestinal transglutaminase, secreted in response to certain lectins, repair lectin-induced damages to the microvilli and gut epithelium. In so doing these enzymes would inhibit and occasionally eliminate the potential for the chronic intestinal inflammation, bacterial overgrowth and illness ascribed to eating “wrong” for your blood type.

### **“Leg Three”**

This leg addresses the secretory differences with regard to digestive juices (enzymes & acids) amongst the blood types. It is explained that higher than average stomach acid levels are to be expected in people with blood type O. The tendency of this blood type to peptic ulcer of the duodenum is cited as evidence of this. The author also notes, that in the practice of the naturopathic doctor who first coined the blood type theory it was observed that “type O patients did well on animal products and protein diets --- foods that require more stomach acid for proper digestion”.

It is known that not all men and women of blood type O hypersecrete HCl, a considerable percent secrete normal levels of stomach acid and some hyposecrete stomach acid; peptic ulcer of the duodenum does not have to be coincident with excess secretion of stomach acid and the localized rather than diffuse histopathology of a peptic ulcer of the duodenum cannot be explained as due to only excess stomach acid secretion, something additional is adversely affecting the duodenal health of patients so prone.

Dietary strategies for type O patients as outlined by the blood type theory are intended, in large part, to treat people who hypersecrete stomach acid. As we have explained this is often not the case and such diet strategies will not be appropriate care for quite a number of people who are blood type O.

More to our focus as regards “Leg Three”, stomach acid does not digest protein, pepsin does. In the blood type diet book it is stated that “type O’s can efficiently digest meats (animal flesh) because they tend to have high stomach acid content”. Hydrochloric acid is necessary for the conversion of pepsinogen (inactive) to pepsin (active). Nonetheless it is pepsin which is responsible for protein digestion, not stomach acid. The optimum pH for pepsin’s protein-digesting activity is 2.0, a gastric pH consistent with what is realized by most non-duodenal ulcer patients. When the pH of the stomach drops to below 2.0 and especially at a pH of less than 1.5 (a pH more consistent with HCl hypersecretion) pepsin becomes demonstrably less effective at digesting protein. Theoretically a person who hypersecretes HCl would be less able to digest protein. Given this, a “one size fits all” diet theory that lumps every blood type O person into an HCl hypersecretor, high animal protein diet will not be health promoting.

A second aspect of the “Third Leg” of the blood type diet theory involves the blood type variability in the secretion of intestinal alkaline phosphatase. Blood type O and B secrete this enzyme while its secretion is negligible in the other two blood types. The blood type diet theory contends that intestinal alkaline phosphatase is an enzyme whose primary function is to split cholesterol and long chain fatty acids. On his website, the author of the blood type theory has stated that intestinal alkaline phosphatase is “an enzyme whose sole function is to break down dietary cholesterol”. This is not true. In the 1960’s intestinal alkaline phosphatase was believed to be involved in lipid absorption, due to its ability to hydrolyze phosphate esters. In the 1970’s reports suggested a different primary function for intestinal alkaline phosphatase, namely, that it is involved in calcium

absorption (Gastroenterology, March 1972 62:3, P. 452-8). Observations by the researchers Norman and Hanssler independently confirmed a two to three-fold increase in intestinal alkaline phosphatase activity after vitamin D administration coupled with a rise in calcium transport. Recently intestinal alkaline phosphatase has been shown to also play an important role in thiamin transphosphorylation and the hydrolysis of FMN and FAD in addition to being involved in riboflavin transport.

At the very least intestinal alkaline phosphatase is involved in much more than the function heralded by the blood type theory. The possible significance of its varying secretion re: blood type to an involvement in cholesterol metabolism is overemphasized by the blood type theory to support an unhealthy recommendation for cholesterol-laden animal proteins.

In our opinion, the blood type theory of diet does not have any legs to stand on.

One of the book's most disturbing characteristics is the frightening images that the author calls forth without providing scientific documentation. For example, D'Adamo hangs much of his theory on the action of lectins, proteins found on the surface of certain foods that can cause various molecules and some types of cells to stick together. He blames lectins for serious disruptions throughout the body, from agglutination of the blood cells to cirrhosis and kidney failure. He even scares the reader about these lectin "boogie men" with the tale of ex-KGB agent Georgie Markov who was murdered with an injection of the ultra-potent lectin, ricin. Then, on Page 53, D'Adamo states that, "...certain beans and legumes, especially lentils and kidney beans, contain lectins that deposit in your muscle tissues, making them more alkaline and less charged for physical activity." This is quite a serious scientific charge, and an alarming thought if you are blood Type O - namely, that after eating a bowl of bean chili or lentil stew, lectin proteins are depositing in your muscles and

altering their function, changing their acidity, and diminishing your capability for physical action.

If one is going to make a statement like that - and publish it in a book destined for the New York Times bestseller list and intended to change the eating habits of a nation - I believe the author is obligated to present solid scientific evidence of supporting their assertions, which D'Adamo repeatedly fails to do. If an author is going to frighten millions of Type O readers about eating kidney beans, lentils, and wheat, I think they are obligated to provide verifiable evidence.

To begin to convince me of the existence of his “lectin demons,” he would have to publish photographs, taken through a microscope, of muscle tissue biopsied from people with Type O, Type A, Type B, and Type AB blood after they have eaten kidney beans and/or lentils. The photographs should clearly show the lectin deposits in the muscles of people with Type O blood - and not in the tissue samples from the muscles of people with Type A blood. If an author cannot produce proof like this, or clearly cite the scientific references in the text where other people have demonstrated such proof, his credibility, to me, is severely diminished. D'Adamo presents neither photos nor corroborating studies to support his speculations.

As for the rest of his statement regarding lectins changing the muscles, “making them more alkaline and less charged for physical activity,” to substantiate that assertion the author would need to publish or cite studies wherein microelectrodes that measure acidity inside the cells were inserted into the muscles of people of various blood types. After they all ate a meal of lentils and kidney beans, if D'Adamo is to be believed, a significantly greater shift towards alkalinity should be seen in the muscles of the Type O subjects. Yet, no such studies are presented. If an author does not have this kind of proof, is it responsible of him to make statements that may frighten millions of people from eating high-protein, high-fibre legumes and other potentially valuable foods? It may indeed be best for a particular person not to eat a particular legume - but they should do

so for solid nutritional/medical reasons (allergies, colitis, etc.) independent of their blood type.

What finally pushes the “blood type” theory beyond the limits of believability for me is the primary mechanism of physiologic damage that D'Adamo postulates - namely, lectin proteins on some foods causing blood agglutination in certain people of blood types who are “not genetically/evolutionarily suited” to eat those foods.

This is a very serious - and potentially life-threatening - phenomenon that he proposes. Agglutination means that the red cells in your bloodstream are irreversibly sticking together and forming clumps. Once they begin to clump together, they do not come apart. (Note that this is very different than blood sludging, or so-called rouleaux formation - a phenomenon seen when the surface of the red cells become coated with fat or other substances to make them sticky enough to temporarily and reversibly adhere to each other's surfaces - but not to become permanently bonded through irreversible intertwining of surface proteins, which is what happens in agglutination.) Having your blood agglutinate as it circulates through your body is not conducive to good health - or to long term (or short term) survival...

What is so bad about little clumps of red blood cells sailing through the bloodstream? Red blood cells deliver oxygen to the cells of vital tissues like the brain, heart and kidneys. To accomplish this delivery, they must flow through the tiniest of blood vessels - capillaries so narrow that the red blood cells must line up single file to get through. If the red cells are being agglutinated by lectins or anything else, clumps of red cells will clog up the capillaries and block the blood flow. Thus, the blood stream will be prevented from delivering its life-sustaining cargo of oxygen to the tissues served by those capillaries. Cells deprived of oxygen become damaged, and eventually die (cell death is called “infarction” of tissue.)

If the capillary beds in your heart, lungs, kidneys, brain, eyes, and other essential organs are subjected to barrage after barrage of agglutinated red cells, they will eventually begin to clog up. These micro-areas of diminished blood flow would at first cause scattered, then more concentrated areas of tissue damage - with eventually many micro-infarctions scattered throughout these vital structures. The brain, heart, lungs, kidneys and adrenals would soon be irreparably damaged by these processes, resulting in potentially fatal outcomes in millions of people.

So when I read a “one size fits all” statement like, “Type O’s do not tolerate whole wheat products at all,” I have to ask, “What does he mean, ‘at all’?” Do Type O’s eat a whole wheat cracker and fall on the ground holding their abdomen and vomiting - or worse yet, suffer immediate brain damage due to their blood cells agglutinating throughout their brain? How much wheat can a Type O eat before their blood agglutinates? One hamburger bun? One noodle?

I am not denying that many people do experience problems when they eat wheat. They do, but they do so because they have a true wheat allergy, gluten intolerance, or some other verifiable mechanism - not because of some sugar and protein molecules sticking up from the surface of their red blood cells. Like D’Adamo, I grant that wheat can be a problematic food for people with colitis, and I often recommend eliminating it from the diet. Lectins may even play a role in the inflammatory process for some people. However, before one tells millions of individuals with Type O blood to never eat whole wheat - many of whom apparently have no difficulty with whole wheat and who rely on breads as a major source of energy and protein – is not some convincing scientific proof required? I feel that author D’Adamo at least owes his readers a text citation with supporting evidence that wheat-induced colon dysfunction is a condition peculiar to Type O’s. Yet, his text is devoid of scientific endnote citations.

To convince me, he would need to show me photographs of intestinal tissue from Type O people who have recently eaten wheat and who clearly have evidence of lectin agglutination clogging up the function of their intestinal cells. I would also need to see pictures of tissue biopsies from Types A, B, and AB whose intestinal walls are seen to be undamaged and far less burdened with lectin deposits than those with Type O blood. As far as I know, inflammation of the intestine, like colitis, Crohn's disease, and gluten sensitivities, occurs in people of all blood groups, not just Type O - and D'Adamo cites no convincing proof to the contrary.

Author D'Adamo also makes three hard-to-believe statements concerning dairy products - two which made me doubt his understanding of basic science and one that raises concerns about the safety of his nutritional advice:

1.) D'Adamo states that, "If a person with Type A blood drinks it (milk), his system will immediately start the agglutination process in order to reject it." If he wants me to believe a statement like that, he had best show me pictures of Type A blood cells under the microscope agglutinating after the person drinks milk, wherein Type O and Type B blood cells are shown not to agglutinate. He again shows no such photos or other believable evidence of the phenomenon. D'Adamo would also have to explain why Type A people who drink milk (sometimes-massive quantities of it) do not suffer strokes and emboli as their blood agglutinates throughout their vascular system. He presents neither proof nor even plausible explanations for the above - very troubling in a book presented as "based on science."

2.) D'Adamo states that, "...the primary sugar in the Type B antigen is D-galactosamine, the very same sugar present in milk." Actually, the primary sugar present in milk is not D-galactosamine, but rather, lactose. Lactose is a very different molecule than D-galactosamine, with very different chemical properties. Even if there were significant amounts of D-galactosamine in cow's milk, the antibodies in a Type

A person's blood that agglutinate with a Type B person's blood cells do so by reacting not with D-galactosamine alone, but with a molecule of D-galactosamine combined with a molecule of the sugar, fucose, projecting from the surface of the red blood cell. Just because Type A antibodies will agglutinate with D-galactosamine+fucose on the surface of a Type B red cell, does not mean Type A blood will agglutinate with the lactose (or even free D-galactosamine) in cow's milk. (It is recognized that people of any blood type may react badly to cow's milk and other dairy products - for a variety of reasons, but likely not because lectins in the milk are agglutinating their "wrong" type blood cells.)

3.) A statement that causes me great concern regarding the safety of D'Adamo's dietary advice appears on page 37, where, despite widespread knowledge that many non-Caucasians are intolerant of dairy products due to the normal disappearance of lactase enzymes in their intestinal cells, D'Adamo recommends that "Type B's of Asian descent may need to incorporate them (dairy products) more slowly into their diets as they adjust their systems to them." This seems like strange counsel from an author trying to improve the intestinal health of his public. I fear that the consequences for many of his unsuspecting, lactase-deficient readers who follow such advice will have to suffer severe bouts of abdominal cramps and diarrhea.

Another assertion in this book that make me not want to recommend it to my patients is on page 53, where D'Adamo writes that: "This condition, called hypothyroidism, occurs because Type O's tend not to produce enough iodine." The reality is that the body does not "produce" iodine at all, any more than it produces calcium, magnesium, sodium, or any other earth mineral. Iodine is a halogen element, related to chlorine and bromine, which is taken up by plants from the soil and in the sea - which are then consumed in the diet. To worry tens of millions of Type O readers that they "may not be producing enough iodine" (which no one does) and are thus at risk for hypothyroidism, is unfounded and, I feel, unnecessarily worrying. The causes of clinical hypothyroidism are complex issues, probably

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involving autoimmune and other mechanisms of injury to the thyroid tissue. To imply that eating red meat and avoiding wheat (a “Type O diet”) will help the Type O person “produce iodine” is unsubstantiated and may not only raise false hopes in the reader, but may also increase the risk of meat-associated diseases.

Beyond the usual association with heart attack, stroke, osteoporosis, colon cancers and other degenerative diseases, animal-based diets foster the growth of pathogenic organisms in the intestine, which can injure the intestinal wall and lead to the “leaky gut syndrome” - a condition of increased intestinal permeability which allows injurious fragments of antigenic food proteins and bacterial breakdown products to leak into the bloodstream.

- 1). These foreign, inflammation-inciting substances can, in turn, exacerbate rheumatoid arthritis, lupus, and other autoimmune diseases in tissues throughout the body.
- 2). The bacteria in the colons of people who consume vegan diets are far less likely to cause these kinds of diseases
- 3). Repeatedly packing the colon full of meat residue from a high protein diet has been shown to be highly correlated with cancer of the colon - among the leading killers of industrial nations
- 4). In fact, animal protein seems to be “high octane fuel” for the growth of many kinds of cancers.
- 5). I fear that the apparent improvement experienced by many people who use the “zone” rationale to become big-time carnivores will ultimately be at the cost of damaged vital organs and more lethal and degenerative diseases.

Remember, there is nothing sacrosanct about the ABO blood typing system devised by Dr. Landsteiner in the 1920’s. It is only one system classifying more than thirty proteins on the surface of cells that

determine other blood groups, with names like Auberger, Diego, Duffy, Kell, Kidd, Lewis, Lutheran, MNSs, P, Rh, Sutter, and Xg.

This means that food selections that may be “right” for the ABO blood group system might be “dead wrong” for someone’s Kell or Kidd antigens. Why are we deifying the D- galactosamine-fucose molecules on the red cell surfaces that determine ABO Type?

In my opinion, D’Adamo has spun an evolutionary fairy tale that leaves many unanswered questions. What exactly is he proposing happened to Type O hunter-gatherers when the Type people began growing wheat, barley and other grains? Do Type O people eat a mouthful of barley and fall down in the dust, unable to work and reproduce? Do they then become warlike and club the agrarian people to death because lectins are clogging their intestines? Do the genetic changes to Type A blood type magically appear just before a society grows new grains (allowing them to eat the new grains in the first place), or did Type A blood types emerge after the grains are grown, as the people with Type O blood died out from their blood agglutinating in their brains? And why would so many of the native Indians of North America, classic Type O hunters, go to the trouble of cultivating high-lectin corn (maize)? Someone talk some science to me, please...

Is the blood type the ultimate determinant of successful adaptation to a particular dietary style? How do we explain the experience of people who say, “I tried to be a vegetarian and it did not work for me - so I added some meat back into my diet and I feel better. I guess I am a Type O caveman,” or “A practitioner of ‘live cell’ analysis stuck my finger and I saw my blood agglutinate! He said I must have eaten foods wrong for my blood type!” I hear variations of these two statements several times per year. Does either of these phenomena validate D’Adamo’s blood type theory?

First, the red cell clumping on the TV screen... I have walked through many medical meetings and health expos and seen this demonstration  
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set up and performed many times. A subject's finger is punctured and a drop of their blood is placed under the microscope slide with the image projected on a large screen or television monitor. The results can appear quite dramatic as a person often sees on the TV screen their red blood cells, platelets, and other cellular elements apparently misshapen and clumped together. It can then be an opportune time to convince the startled person that their blood is laden with toxins or deficient in vital minerals or some other nutrient - and then sell them the "necessary" supplements that the "live cell analyst" happens to be purveying.

Though the images may be graphically convincing, the unsuspecting subject is probably unaware that they may have just witnessed a biological parlor trick. The "live cell analyst" has probably failed to inform them that the "agglutinating" effect seen on the screen can be produced by a number of factors, most having nothing to do with lectins, blood type, or any other forces beyond the physics and chemistry of a drop of blood on a slide. Remember, that a drop of blood on the microscope slide is very different than a drop of blood flowing through your bloodstream.

While flowing naturally through the bloodstream within the arteries and veins, the blood is shielded from light, is held at a constant temperature of 98.6 F., is under much higher pressure than room air, and is physically moving very rapidly through the "piping" system of blood vessels. These are all factors which profoundly affect the surface characteristics of the red blood cells, making them less likely to stick together. The red cells' rapid motion through the bloodstream also prevents antibody fixation, blood clotting factor activation, and other pro-agglutinating forces from exerting much effect. When the drop of blood is squeezed out onto the microscope slide, all these factors are changed or eliminated. At that point, physical forces - cooler temperatures, lower pressure, exposure to light, physical stagnation, activation of enzyme systems, etc. - begin to affect the blood on the slide in ways that may make it much more

likely that the cells may begin to clump together - independent of blood type or presence of lectins.

In addition to the above purely physical influences, other chemical factors may be at work on the slide to create the appearance of clumping - independent of the person's blood group. These chemical agents include:

1. The person's last meal. In particular, the fats from the egg yolk at breakfast or the olive oil in the salad dressing at lunch may be invisibly coating the red blood cells, making them stickier and more likely to adhere together. Fats will make red blood cells of all blood types sticky and more likely to clump together. In my experience, "live cell analysts" seldom ask the subject about their last meal nor analyze it for the fat content.
2. Antibodies (immune proteins that can bind to cells) left over from a recent viral infection or allergic reaction - but not associated with food lectins - can coat red blood cells and make them prone to clump together.
3. Molecules with unknown chemical properties, introduced into our blood from living in the "civilized world" - such as food colorings, food preservatives like BHT (butylated hydroxytoluene), hydrogenated oils eaten in fast foods, snacks, and restaurant meals, as well as birth control pills, aspirin, cold medications, and over-the-counter remedies, etc. - may affect the tendency of blood cells to clump, independent of lectins or blood type.
4. The acidity (pH) of the blood, the levels of calcium, sodium, and other circulating minerals - even the concentration of salt in the "saline solution" that the "live cell analyst" mixes with the drop of blood - can all dramatically affect its behavior and appearance on the slide. Add to this the effects of exercise, medications, even a prolonged time since the last drink of water - it is no wonder the blood on the slide might look strange. There are hundreds of unseen

forces acting upon the red blood cells, platelets, and suspended plasma proteins.

Under some conditions, the blood cells of some individuals might even tend to clump together when viewed on the television screen. However, this does not mean that individual is ill, suffering from a nutritional deficiency, or is being agglutinated internally from the lectins in their diet. Unfortunately, this is often not the message they receive from the “live cell analyst” about to make a recommendation as to which one of their proprietary supplements to buy in order to remedy the “condition.”

Technology creates a powerful imagery and it is easy to abuse. There seems to be quite a number of people demonstrating the televised technique for the public who are unaware of the subtleties of the blood stream and the body - and thus not qualified to make clinical diagnoses based upon what they are seeing on the TV monitor. Yet, it is very easy for “a live cell analyst” - for reasons altruistic, capitalistic, or otherwise - to issue an ominous-sounding term or diagnosis to an unsuspecting member of the public. I have had several people consult me, worried that their blood was agglutinating inside their arteries, or that their “immune system was shot,” based upon comments made at a health expo by a “live cell analyst” - who had received little more than a weekend training course. The public should be made aware of the limitations of the “live cell analysis” technique, so they are not unduly frightened by what they may see on the screen or hear from the analyst.

What of the people who say they feel better when they resumed flesh eating after intervals of consuming vegetarian or vegan diets? Unquestionably, their experiences have some important messages for us. But what are they? Here are some possibilities...

It is known that, in some people, merely adjusting the proportions of proteins, fats and sugars in any manner significantly new to their body can produce noticeable improvements in the way they feel.

Changing the proportion of raw vs. cooked foods can similarly have beneficial effects. Some people who feel that their health has improved after adopting a “zone or blood type” diet may actually be benefiting from just eating less carbohydrates, more protein, etc.

We recognize that there are significant metabolic differences between people. It may well be that some of these differences may propel certain individuals towards flesh consumption. It may be, however, that the cause is not so much genetic, as acquired after birth.

Remember, virtually every person who reports adding meat back into a previously vegetarian diet is an individual who was raised on a meat-based diet. Why is this important? The kind of foods one eats in their early years may set biochemical patterns that last for a lifetime. For example, the human body can synthesize from simpler molecules some essential substances like carnitine (required for energy production) and some long-chain fatty acids (EPA, DHA, etc., needed for hormone function, membrane synthesis, etc.). People who eat meat ingest these substances, pre-formed, in the muscles and other animal tissues they consume. It may be that the body of a person raised as a life-long omnivore becomes functionally dependent upon a diet that contains these pre-formed nutrients. As adults, if they suddenly change to a completely plant-based style of eating, where the foods are essentially devoid of pre-formed carnitine, EPA, DHA, etc., they may find themselves in a body with enzyme systems unable to synthesize all the energy-generating compounds, fatty acids, and other molecules they may require. After months or years on a flesh-free diet, these individuals might experience deterioration of their health or energy - only to feel better upon resumption of meat ingestion. To the person, this may seem like confirmation that they are “natural meat eaters.” Rather, it may be evidence of an acquired dependency on flesh-borne nutrients formed through early eating patterns. If this is the case, it may be possible to prevent, repair, or at least compensate for these imbalances through provision of additional nutrients, removal of inhibiting substances in the diet, varying combinations of food, etc.,

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utilizing foods of plant-based origin. There is much to learn about the subject and much research needs to be done.

In my experience, these problems are not encountered in people raised on vegetarian diets from infancy. This effect might be especially pronounced in long-term omnivores who make an abrupt change to a vegan diet, as opposed to those who taper flesh foods out of their diet more gradually. It may be that some “omnivore-from-birth” people who desire to sustain themselves on a vegan diet may have to make a more graded transition to completely plant-based foods, sometimes over several weeks or months, to give the body time to “gear up” its metabolic machinery. In other words, what appears to be a “natural need for meat” may really be the need for an attenuated weaning process from animal products in order to overcome metabolic patterns begun early in life, created largely by cultural practices.

An additional thought: Less than optimal function on a plant-based diet (or any diet) may not stem from a “lack of meat” or a nutrient deficiency at all, but rather from an individual’s other health conditions, like digestive dysfunction, malabsorption by the intestine, parasite problems, adverse immune reactions, etc. To me, these are far more likely mechanisms that could explain the “failure-to-thrive” syndrome occasionally seen in vegetarians and vegans - rather than a genetic mandate to consume flesh determined by their blood type. Much more research is needed to obtain the answers to so many questions in this essential but subtle science.

Beyond the “blood type issue,” perhaps a deeper question about any book which advocates a meat-based diet for the majority of the population is, “In today's world, is eating meat, in any form, safe?” It appears that to base one’s diet around animal foods is becoming a high-risk activity, similar to unsafe sex or driving without wearing a seat belt. Consider the smorgasbord of health hazards available at today’s meat counters. It is a safe bet that virtually every cut of “fresh” meat produced commercially today contains:

- Residues of hydrocarbon pesticides and herbicides, linked to cancers and birth defects
- Residues of antibiotics and growth-augmenting sex hormones fed to the animals and stored in their tissues
- Fecal microbes, like the potentially lethal E. coli 0:157 and Salmonella bacteria.

The nightmare specter of the brain-destroying prion protein, the cause of spongiform encephalopathies – “mad cow disease” in bovines - Creutzfeldt-Jacob disease, or CJD in humans.

Given these ever-increasing risks connected to meat consumption, I fear that the theories and books that attempt to justify and promote the eating of flesh - for whatever reason - could be opening the floodgates of ghastly epidemics five or ten years from now. These plagues likely will have a magnitude that will dwarf everybody’s concerns about “being in the zone” or eating “right for your type.” Finally, no matter what advocates of animal-based diets might say about the merits of being in the “zone” or “eating right for your blood type,” from an ecological standpoint, a meat-based diet for the world’s population is non-achievable and, for even a sizeable minority, is non-sustainable. The world’s soils, waters, and forests are being decimated to produce meat-based diets. We are destroying the life support systems of our planet - of our children’s planet - for a mouthful of flesh. To me, the promotion of diets centered on meat increases the chances of ecological catastrophes and thus jeopardizes each of our futures.

I wish for everyone optimal health, happiness, and longevity. We owe it to ourselves, to our children, and to all who come after them, to see how optimal function and life span can be achieved on diets that are truly sustainable - for individuals, for societies, and for the planet. It is, after all, the food of all our futures.