

Scientific Support for Chapter 4

Confirmation of blood buffering / constant pH

Confirmation of precise blood buffering regardless of H^+ production is confirmed from the medical text, *Mathematical Physiology (II: Systems Physiology)*-2nd edition) by James Keener & James Sneyd published in 2009. The relevant section is 13.3.3 on pages 649-652: Carbon Dioxide Transport:

“ $[HCO_3^-] = h + n(Z+W) - T_o$whereas in normal blood, practically all the H^+ produced by the carbonic anhydrase reaction is absorbed by hemoglobin. This demonstrates the importance of hemoglobin [a protein] as a hydrogen ion buffer.

“As a final note, the most important system for controlling extracellular acid-base balance is the bicarbonate buffer system. Extracellular fluid contains large amounts of bicarbonate ions, mostly as $Na^+HCO_3^-$. Addition of excess H^+ ions drives the carbonic anhydrase reaction to produce carbon dioxide; the additional CO_2 produced can be removed at the lungs. Conversely, addition of a strong base and consequential removal of the H^+ results in lowering of $[CO_2]$ and the production of additional H^+ . Since the overall levels of bicarbonate and carbon dioxide are *controlled by the kidneys and*

the lungs, respectively, this allows effective and precise control of the pH of extracellular fluid."

"Protein Consumption and Bone Mineral Density in the Elderly: The Rancho Bernardo Study," Promislow, J, et al., *American Journal of Epidemiology*, 2002, Vol. 156, No 7, pages 636-644:

- "This association was *statistically significant in women [MORE protein = DECREASE in OP]*. For every 15-g/day increase in animal protein intake, BMD [bone mineral density] increased by 0.016 g/cm² at the hip ($p = 0.005$), 0.012 g/cm² at the femoral neck ($p = 0.02$), 0.015 g/cm² at the spine ($p = 0.08$), and 0.010 g/cm² for the total body ($p = 0.04$).
- "Conversely, a *negative association between vegetable protein* and BMD was observed in both sexes.
- "This study supports a *protective role for dietary animal protein* in the skeletal health of elderly women.
- "*Clinical trials* in hip fracture patients have *consistently* observed that patients who receive *protein* supplements *experience significantly improved recoveries and reduced bone loss*. Dietary protein has historically been investigated largely in regard to its effect on calcium balance.
- "However, *protein itself is an important structural component* of bone, accounting for approximately *half of bone volume and one fourth of bone mass, including the skeletal matrix.*"

2006 Study Shows High Protein Diet *Did Not Increase Bone Loss*

“The effect of a low carbohydrate [**higher protein**] diet on bone turnover.” *Osteoporosis International* (Carter, JD, et al., 2006, May 23 [Epub ahead of print]).

If patients follow a “low-carbohydrate diet,” they are consuming a much greater amount of protein, i.e., a higher-protein diet. Here’s the conclusion you need to know:

- “A **strict low-carbohydrate [high protein] diet had no effect on bone loss** for adults **following an Atkins-type [high protein] diet for weight loss**, a three-month study by rheumatologists at the University of South Florida found.”
- “Patients on the low carbohydrate diet **did lose weight**, but the diet **did not** appear to **compromise bone integrity or lead to bone loss.**”
- “‘I was **surprised** by the results,’ Dr. Carter said.

“**The difference in bone turnover** between the low carbohydrate dieters and the non-dieters **was insignificant** after three months.”

2008, *British Medical Journal* reports calcium supplements increase cardiovascular events and brain lesions.

Bolland, MJ, et al., “Vascular events in healthy older women receiving calcium supplementation: ran-

domised controlled trial," *British Medical Journal* **2008**; 336:262-266.

- **"Myocardial infarction was more commonly reported in the calcium group** than in the placebo group (45 events in 31 women vs 19 events in 14 women, P=0.01).
- **"CONCLUSION: Calcium supplementation** in healthy postmenopausal women is associated with **upward trends in cardiovascular event rates**. This potentially **detrimental effect** should be balanced against the likely benefits of calcium on bone. [Note: Calcium supplements are not required for anyone unless the patient suffers a pathophysiologic disorder.]
- **"The finding of an adverse trend in vascular events with calcium supplementation is not necessarily surprising,** since calcium supplements acutely *elevate serum calcium levels possibly accelerating vascular calcification*, which is predictive of vascular event rates. **High calcium intakes** have also been **associated with brain lesions** on magnetic resonance imaging scans and with **vascular calcification** and mortality in patients who receive dialysis."

Protein Positively impacts blood chemistry — Verified in 2005 OMNIHEART STUDY¹

If you are a cardiologist, you likely saw this on-line at the cardiologist's news journal, *theheart.org*. Once again,

1 <http://www.theheart.org/printArticle.do?primaryKey=601763>, ref: Appel, JL, et al., "Effects of protein, monounsaturated fat, and

we see what “sounds good” again failing to predict the *real-life* results of your patients:

- **“Turning conventional dietary wisdom on its head,** results of the OMNIHEART study indicate that substituting **proteins** or **unsaturated fats** [PEOs] for carbohydrates within the context of a healthy diet can **reduce blood pressure and improve lipid profiles.**
- **“...Compared with participants eating the carbohydrate-rich diet,** those eating the **protein-rich diet** had greater **reductions in blood pressure, LDL, and triglycerides...**
- **“... [Dr. Barbara] Howard also took issue with the study’s focus on monounsaturated fats, saying she would have preferred a study emphasizing polyunsaturated fats [PEOs], which are known to have a better effect on cardiovascular risk than monounsaturated fats.”**

Report from the Association of Official Analytical Chemists International (AOAC) (2005):

- **“Digestibility of protein in traditional diets from developing countries** such as India, Guatemala, and Brazil is **considerably lower** compared to that of protein in typical North American diets.
- **“The presence of less digestible protein fractions, high levels of insoluble fiber, and high concentrations of anti-nutritional factors** in the diets of developing countries,

carbohydrate intake on blood pressure and serum lipids.” Ref.: *Journal of the American Medical Society* 2005; 294:2455-2464.

which are *based on less refined* cereals and grain legumes [soybeans, peanuts, beans, lentils, chickpeas, etc.] as major sources of protein, are responsible for *poor digestibility of protein*.

- “**Anti-nutritional factors may occur naturally**, such as glucosinolates in mustard and rapeseed [Canola] protein products, trypsin [required for digestion] inhibitors and hemagglutinins [causing heart attacks] in **legumes**, tannins in legumes and **cereals**, **phytates** in cereals and oilseeds [husks only], and gossypol in cottonseed protein products.
- “The presence of **high levels of dietary trypsin inhibitors** from soybeans, kidney beans, or other grain legumes can cause **substantial reductions in protein and amino acid digestibilities** (up to 50%) in rats and pigs.”

Ref.: Kimura, Yasumi, et al., “Meat, fish and fat intake in relation to subsite-specific risk of colorectal cancer: The Kukuoka Colorectal Cancer Study, *Cancer Science*, 2007, Vol.98; (4):590-597.

- “Recent studies published in the journal *Cancer Science* (from the Fukuoka Colorectal Cancer Study), a population-based case-control study, covering 782 cases and 793 controls) have *disproved the myth* that consumption of **red meat increases colorectal cancer**:
- “Researchers have run a **large case-controlled study in Japan**, examining associations of meat, fish and fat intake with risk of colorectal cancer...”

- “[F]ound that intake of **beef/pork**, processed meat, total fat, **saturated fat** or n-6 PUFA [**parent omega-6**] showed **no clear association** with the overall or subsite specific risk of **colorectal cancer**.
- “Our findings **DO NOT SUPPORT** the hypothesis [guess] that **consumption of red meat increases colorectal cancer risk...**”

2009—More confirmation that meat, in and of itself, is not colon cancer causing.

Key, TC, et al., Cancer incidence in vegetarians: results from the European Prospective Investigation into Cancer and Nutrition (EPIC-Oxford),” *American Journal of Clinical Nutrition* **2009**;89(suppl):1620S-6S.

- “This was a prospective study of 63,550 *men and women* recruited throughout the United Kingdom in the 1990s. **Cancer incidence was followed through nationwide cancer registries.**
- “Within the study, the incidence of **all cancers combined was lower** among **vegetarians** than among meat eaters, **but the incidence of colorectal cancer was higher in vegetarians than in meat eaters.** “Our observation that the incidence of **colorectal cancer is higher among vegetarians than among meat eaters** in the EPIC-Oxford study **is surprising....**”

Malhotra, SL, “*Epidemiology of Ischaemic Heart Disease in India with Special Reference to Causation,*” *Br Heart J.* 1967 November; 29(6): 895-905.

- “Our data, however, **do not support this association of high fat [from significant meat consumption]** intake with the liability to develop ischaemic heart disease, because while in the **north** the consumption of fats, most of which are **animal fats, is 19 times more than in the south (Indian Council of Medical Research, 1964)**, the **disease is 7 times less in the north than** in the south. Moreover, while the **milk fats eaten in the north** have a preponderance of **saturated fatty acids**, the seed oils used in **the south** are mainly composed of **unsaturated fatty acids** (Indian Council of Medical Research, 1963). [Note: Dr. Rowen donates his time and expertise to Indian patients during his yearly trek to India. He reports extensive adulteration of their cooking oils.]
- “This **inverse association is noteworthy**, especially because **others have also observed this association of high intake of animal fats and freedom from cardiovascular disease** (Shaffer *et al.*, 1964; Shaper, Jones, and Kyobe, 1961; Mann, Shaffer, and Rich, 1965). This evidence from other studies and our additional findings of the **inverse association** of a low intake of total as well as animal fats [**meat eaters**] and a high frequency of **ischaemic heart disease** in the south [**vegetarians**] are **contrary to the view** that it is the quantity of dietary fats and their degree of saturation [**saturated fat**] that bear responsibility for cases of this disease.
- “**Neither** smoking, nor socio-economic factors, *nor physical activity* of work, nor even stress and strain **have provided any tenable associations with the**

immunity from or a liability to develop ischaemic heart disease, in the data presented in this paper. Nor is there any incontrovertible evidence that the total amount of fat in the diet bears responsibility for the production of this disease.

- *“Physical Exercise versus Inactivity. An unexpected and extraordinary finding in our data is that mortality in the sedentary occupation of clerks is lower than the physically active occupation of fitters. Furthermore, in the same type of physical jobs, 15 times higher in the south [vegetarian fitters]. [Note: Patients can’t merely “exercise away” a nutritional deficiency or solve the consumption of adulterated PEOs by exercise.]*

Carbohydrates, Not Proteins, Destroy Good Blood Chemistry

Chapter 5 will discuss the effects of carbohydrates in more detail. Dr. Gerald Reaven – the physician who coined “metabolic syndrome” – shows by experiment that **increasing carbohydrate consumption by only 20% yields their poor and disturbing results via altered blood chemistry** (Stanford University School of Medicine: *American Journal of Cardiology* 2000 85:45-48, (Dr. Gerald Reaven)). To the contrary, protein doesn’t have a deleterious effect on blood chemistry.

Even a High-Fat / High-Protein Diet with Lots of Cholesterol is Insignificant

Cholesterol comes from animal-based foods, not plant-based foods. Dr. Raven shows this again in his journal article (Reaven, GM, et al., “Insulin resistance, dietary cholesterol,

and cholesterol concentration in postmenopausal women,” *Metabolism – Clinical and Experimental*; Vol. 50 (5), May 2001, pages 594-597. A key finding was that consumption of high amounts of cholesterol-containing foods **did not result in a proportionate increase in** blood cholesterol. You may find amazing, as I did, the effectiveness of the body’s automatic regulation of cholesterol:

“With even a 30% fat diet, **increasing dietary cholesterol** from 319 mg to 941 mg per day [close to **a huge 300% increase**], the blood LDL-C was only a **mere 6% increase** [20 points]!”

Even insulin-resistant women did not experience a significant cholesterol increase!

From Dr. Rowen:

Let's look further. Vitamin C is also crucial. Mount Sinai researchers² have shown in an animal model that the vitamin actively protects against osteoporosis. Mice were given ovariectomies and were compared to mice given a sham operation. The ones with ovaries removed were further subdivided to receive vitamin C or no vitamin C. The researchers found that mice absent ovaries that received vitamin C had bone mineral density matching that of mice with intact ovaries. Essentially, vitamin C effectively replaced ovarian function in protecting bone! The nutrient does this by activating osteoblasts (bone-forming cells) to become fully active. Where do you get vitamin C? Certainly NOT from animal flesh or animal protein at all. You get this crucial nutrient from fruit and vegetables, and it is partially destroyed by heat! Hence, my preference for living foods!

Now let's look at a recently published study which, in my opinion, slam-dunks the issue. A simple nutrient, potassium citrate (together with vitamin D and calcium), was found to significantly increase bone mineral density in elderly osteoporosis-free men and women. Dr. Reto Krapf of Switerland, one of the authors, told Reuters Health, "By neutralizing the acid we generate by our diet, it is possible to slow or possibly reverse the age-related decline in bone density and bone mass." Their research comes on top of earlier work that osteopenia (mild osteoporosis) can be reversed with potassium citrate. The supplement completely neutralized their bodies' acid production, and they had lower calcium excretion at 6 and 12 months of the study. High-resolution tests confirmed more bone density and improved bone structure.

2 *Science Daily*, October 9, 2012

Having said this, I do agree with the good professor regarding the protein need for healthy bone. After all, the bone matrix is protein, and calcium is ushered in to harden this protein base. But, clearly from the above, it is not necessary that the protein you eat be all or even mostly animal protein. In fact, consumption of dairy, with all its calcium and protein, hasn't been shown epidemiologically to protect. Why? Cow milk is loaded with phosphorus. Your body will excrete calcium along with the load of phosphorus. This suggests that dairy will be largely pH- and osteoporosis-neutral on your body. "Mild" is considered pH neutral by clinicians. Finally, another problem with most dairy is that it has been pasteurized. The heat destroys certain nutrients, including enzymes necessary to free up calcium and other nutrients for absorption.

With regards to cancer, I agree with Prof. Peskin that it's largely processed meat that raises risk. Processed meat has foreign chemicals, and other man-made adulteration, that would not be good for any God-made creature. On the other hand, meat requires cooking to kill potentially horrific contaminating bacteria—at least for human consumption. I've yet to see a lion roast a zebra. I'll be discussing the toxic impact of heat on your food in Chapter _____. Additionally, meat made for human consumption may be also loaded with hormones, pesticides, and other chemicals dumped into the animals to increase corporate profit at the expense of your health. I have no issue with you eating organic grass- or range-fed animals or wild fish from unpolluted waters.

Now to me, the greatest mind in history regarding diet was Weston Price, DDS, who authored *Nutrition and Physical Degeneration* in 1939. He traveled to aboriginal cultures all over the world and found that their usual state of good health was not tarnished UNTIL they adopted what I call "the white man's food." That is the term I use to refer to the processed and adulterated foods of western man. Clearly,

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eating meat was not a problem for aboriginal cultures. However, I do feel you can eat too much, even in an aboriginal group.

Samuel Hutton wrote *Health Conditions and Disease Incidence Among the Eskimos of Labrador* after observing Inuits from 1902-1913, when they were still eating their aboriginal high meat/seafood diet. Indeed, they were extremely robust and healthy when young. But, by middle age, their vital organs began to break down. They aged rapidly, and suffered severe osteoporosis. (Hmmm.) They also had low resistance to infectious disease. Hutton confirmed the fact that cancer and other diseases of civilization were rare in the Inuits but had this to say about their life expectancy: “Old age sets in at fifty and its signs are strongly marked at sixty. In the years beyond sixty, the Eskimo is aged and feeble. Comparatively few live beyond sixty and only a very few reach seventy...” Missionaries had left careful records of these facts for over 100 years. These observations were written years before the current controversies over the “right” diet, so we are getting information at the source.

Now I can't tell you how much protein is too much. But, I firmly believe we only need about 30–40 grams of high-quality protein per day. **What is high-quality protein? It is a protein that has all the essential amino acids, and is DIGESTIBLE.** Plant proteins can lack certain essential amino acids, for sure, but, in contrast to animal protein, they are seemingly more digestible. Can you get enough protein from plants? Well, I do my rigorous hiking as a raw food VEGAN, and I do quite well! I believe that plant amino acids are more readily available than those in meat.

True, many plant proteins are deficient in one or more amino acids. But look at our great ape cousins. They forage and eat a large variety of vegetarian foods, and no dairy. They have plenty of amino acids to build muscles far stronger than our own. The variety of plant sources ensures

a good quantity of all essential amino acids. (I'll have more on our great primate cousins in a later chapter.)

Furthermore, contrary to popular belief, many plants other than the scorned soy have complete amino acid profiles. Spinach and other leafy greens, for example, are packed with protein. In fact, 30 grams of spinach contain 1 gram of highly digestible, full-spectrum protein, or close to 3%. While not on a par with animal flesh by weight, it clearly has what I need. I average about 1 pound per day of a mixture of green, leafy veggies, in addition to a wide variety of other plants. With one pound being 454 grams, I get about 15 grams of protein from these greens ALONE. Nuts, seeds, and fermented dairy add to my base. My blood-essential amino acids are all well within an acceptable range.

There is epidemiological evidence of the superiority of plant-protein-based diets. Campbell reported in *The China Study* that all-cause mortality rose in proportion to the amount of animal protein eaten in several rural China villages. While there are some holes in the methodology, the observation is hard to refute. Former President Bill Clinton had serious heart disease. In September 2004, he underwent quadruple bypass. In 2010, he adopted the suggested diet. He effectively lived as a vegan, eating vegetables, fruit, legumes, and a morning protein shake. *The New York Times* (August 18, 2011) reported that he quickly lost 24 pounds and returned to his college weight.

The longest-lived peoples in the world today include: the Abkasia of Southern Russia, the Vicalbamba Indians of the high Andes, the Hunza of north Pakistan, Okinawans, and the California-based Seventh-day Adventists. John Robbins, in *Healthy at 100: The Scientifically Proven Secrets of the World's Healthiest and The Longest-Lived Peoples*, describes the lifestyles and dietary patterns

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of these long-lived cultures. He reports that the calorie breakdown of the food the first three groups ate daily was between 69–73% carbohydrates, 15–18% from fat and 10–13% from protein. With the exception of Okinawans, who eat fish, these are largely vegetarian societies. Overall daily calories ranged between 1,700–1,800, while the Abkhasia ate 90% plant foods and the Vilcabamba and Hunza ate 99% plant foods.

All three ate low amounts of salt, zero sugar or processed food, and had no incidence of obesity and other common diseases.

Robbins also discussed the Okinawan people. Also a long-lived group, they do eat a more animal-based diet (fish) but had a similar lifestyle as the other groups.

In America, the Seventh-day Adventists continue the pattern. They are culturally a rather homogenous lot for America, and are the longest-lived cultural group in our country. Those who choose a vegetarian lifestyle live, on average, about four to five years longer than their carnivorous counterparts, and use the medical system far less.

One medical report on Adventists tells it clearly: The lifetime risk of ischemic heart disease was reduced by 31% in those who consumed nuts frequently and by 37% in male vegetarians compared with nonvegetarians. Cancers of the colon and prostate were significantly more likely in nonvegetarian Adventists (relative risk—RR—of 1.88 and 1.54, respectively), and frequent beef consumers also had higher risk of bladder cancer. Intake of legumes was negatively associated with a risk of colon cancer in nonvegetarians, or a risk of pancreatic cancer. Higher consumption of all fruit or dried fruit was associated with lower risks of lung, prostate, and pancreatic cancers. Cross-sectional data suggest vegetarian Seventh-day Adventists have lower risks of diabetes mellitus, hypertension, and arthritis than nonvegetarians. Thus, among Seventh-day Adventists, vegetarians

are healthier than nonvegetarians. But this cannot be ascribed only to the absence of **meat**.³

I want to emphasize caution in interpreting the conclusion that the health of the vegetarians is due to absence of meat only. Those who are vegetarian might be taking many steps to preserve their bodies. However, these epidemiological findings remain consistent with my observations and many other reports, one of which I'll mention.

The Oxford Vegetarian Study⁴ is a United Kingdom prospective study of 6000 vegetarians and 5000 nonvegetarian control subjects. They were recruited between 1980 and 1984 and followed for 12 years. All-cause mortality in the whole group was half that of the population of England and Wales. After adjusting for smoking, body mass index, and social class, death rates were lower in non-meat eaters than in meat eaters for each of the mortality endpoints studied, including vascular disease and malignancy. More animal products were positively associated with coronary disease. Non-meat eaters had only half the risk of meat eaters of requiring an emergency appendectomy, but, vegans were found at risk for iodine deficiency. The authors stated, "The health of vegetarians in this study is generally good and compares favorably with that of the non-vegetarian control subjects."

This study did state, however, that the size of the study precluded meaningful investigation of mortality from specific diet-related cancers, and recommended the EPIC study, which was in progress at the time. The EPIC study ultimately did show a higher colon cancer rate in vegetarians taken

3 Fraser, GE, "Associations between diet and cancer, ischemic heart disease, and all-cause mortality in non-Hispanic white California Seventh-day Adventists," *Am J Clin Nutr* 1999;70(suppl.):532S-538S.

4 Appleby, Paul, N, et al., "The Oxford Vegetarian Study: an overview," *Am J Clin Nutr* 1999;70(suppl):525S-31S.

from the general population, whereas the study of Adventist vegetarians showed a significantly lower rate, which would indicate that there were unknown variables at work. The EPIC study was reported by Prof. Peskin earlier in this chapter.

Finally, more intake of particular amino acids, including essential, might not be better. Consider the essential amino acid methionine. Some recent research⁵ has found that restricting this essential amino acid in animals provides similar longevity enhancement as calorie restriction in rodents. Restriction of methionine reduces mitochondrial oxidative damage, reduces mitochondrial membrane unsaturation (important as per Prof. Peskin), and decreases five different markers of protein oxidation (markers of damage) in rat heart and liver mitochondria. This research group found that methionine supplementation increased oxidative damage in rat liver mitochondria. They expressed concern that the methionine in the average western diet is 2–3.3 fold higher than the average adult requirement. Furthermore, there is an abundance of literature now that methionine restriction might be a cornerstone of cancer treatment. Perhaps that's one reason why Max Gerson, MD was so successful years ago in CURING cancer with raw vegan diets and juicing. These food sources do have low methionine relative to methionine abundance in meat.

Clinically I definitely find that certain people do better eating some animal protein. Among these are those with blood group O. These people may have more direct links to our Paleolithic ancestors eating a hunter-gatherer diet. They also, in my experience, are highly

5 Gomez, J., et. al., "Effect of methionine dietary supplementation on mitochondrial oxygen radical generation and oxidative DNA damage in rat liver and heart," *Journal of Bioenergetics and Biomembranes*, vol 41, issue 3, PP 309–321.

intolerant of grains. People with blood type A seem to do quite well with little or no animal flesh. I haven't seen enough type Bs to make a definitive clinical opinion, but some seem to do better with at least a small amount of animal protein. You can find more on eating for blood type in the book by Peter D'Adamo, *Eat Right for Your Type*. I don't agree with everything he says, but I do find clinically that his position on blood type O is the most accurate of the four blood types.

The basis for anyone's diet should be Living Foods (uncooked), regardless of blood type or anything else. I encourage all my patients to eat 75% of their diet as nature made it (other than chopping, blending, etc.). ***With the other 25%, I don't care, just as long as it is not fast, fried, refined or processed.*** Those making this change respond so much better clinically that this change alone could run Pharma out of business. I don't encourage grains, especially those containing gluten, because grains must be processed or cooked.

Weight loss? Clinically it is not problematic for those following this plan. Metabolic syndrome (insulin resistance) and Type 2 diabetes (adult) in the USA is epidemic. Ninety percent of these problems in our country are related to diet-induced obesity. Gabriel Cousens, MD, in his book, *There Is A Cure For Diabetes*, demonstrates absolute cures of the problem following a raw food diet. I've found the same cures/improvements in my patients independently.

I'll have more for you in my chapter devoted to Living Foods, where I will use myself as the example.

While Prof. Peskin and I have a different take on diet here, there remains a common thread. We'll be getting to a surprising common denominator, which we both believe trumps our individual views on vegetarian vs. non-vegetarian. For anyone who eats, the PEO Solution is for you!

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Addendum. Just after completing this chapter, a major article⁶ was published basically confirming my decades warnings about red meat. It even took the good professor by surprise. It was NO surprise to me, but clearly slammed the meat advocates of the world. This is such an important finding and issue that I decided to provide you with the uncut version of information I presented to my *Second Opinion* readers. I do think that after reading and digesting this information, you'll come to my side on the red meat issue. This report confirms the analysis of the professor on cholesterol, but comes to a different conclusion regarding the safety of red meat for completely different reasons.

Folks, sometimes human intrigue leads us to some amazing discoveries, even in conventional medicine. Such has just happened with a study exploring, a bit more deeply, a possible connection between heart disease and red meat.

You have repeatedly heard in the press that red meat might not be so good for you. Of course, the cattle industry's back bristles at every one of these challenges.

Years ago, we were led to believe it's all the fat or cholesterol in red meat, especially if it's marbled. Then, we were led to believe that the culprit is processed meat. Indeed processed meat is far worse. It's famed for its nitrites and other toxic additives. But more recently, unprocessed red meat has been linked to greater heart disease.

Now this goes against what those advocating the Paleolithic diet believe. That diet is touted as the answer to just about everything. Eating as our "caveman ancestors."

6 Koeth, et. al, Intestinal microbiota metabolism of l-carnitine, a nutrient in red meat, promotes atherosclerosis, *Nature Med*, April 7, 2013.

A diet of animals they hunted, and plant materials they gathered. Sounds lovely, doesn't it? Just eat like our ancestors and you might not get heart disease? Well, you just might get heart disease after all. And new research strongly suggests that you can. Furthermore, this research may fully explain the "mystery" of why our Egyptian ancestors had heart disease (discovered on CT scans of mummies). The news media would have you believe that since these ancestors had coronary disease 4000 years ago, and they were not eating a "modern" diet, that humans are condemned to have heart disease simply by being human.

I reported this finding regarding mummies, and told you otherwise—that there had to be other factors, such as what they were eating and how they prepared their food, even if it were not processed like today's "food." I am simply delighted to bring you research from the prestigious Cleveland Clinic that provides the link between coronary disease in mummies to the heart disease of today. And best of all for me, this discovered link validates everything I have been bringing to you in these pages since I took over the helm at SO. Hold on to your hats, as I tie a fascinating puzzle together for your consideration and action.

*Dr. Stanley Hazen is section head of preventive cardiology and rehabilitation at the Cleveland Clinic. There, scientists and clinicians wondered out loud about the cholesterol/fat theory of red meat as a cause of coronary disease. **See, the cholesterol and saturated fat theory just didn't pan out. Even the mainstream is finally "getting it."** Hazen's group thought that there might be something else*

in red meat that was a key culprit, trumping its cholesterol and marbled fat.

*The researchers kept samples of blood on more than 10,000 patients and followed them for the subsequent development of heart disease. Then, they started looking for the unknown. They found higher levels of a common and needed molecule for human physiology in their blood—carnitine. But it turned out that it wasn't just carnitine itself. We need carnitine for mitochondria to work. They found that higher carnitine was associated with another molecule, induced by ingestion of carnitine. Specifically, intestinal bacteria convert carnitine into a little-known molecule. The intestines absorb that molecule. Then, once in the liver, it is further converted into a molecule called TMAO (trimethylamine-N-oxide). **Their research led them to conclude that TMAO carries a 10-fold risk for heart disease compared to cholesterol.***

I'll tell you more about it in a moment.

The researchers combined some novel findings in mice and human subjects, including THEMSELVES. Hazen was actually a part of the human side of the study!

First though, the mice. The team found that chronic supplementation of carnitine, which is structurally similar to amino acids, reduced "reverse cholesterol transport." That is the process by which your body picks up and removes cholesterol from your arteries and delivers it back to your liver for elimination through the bile. You do NOT want that process hindered.

Now the underlying factor in these mice was their intestinal bacterial (flora) composition. The chronic carnitine supplementation altered their flora. It encouraged growth

of organisms that broke down carnitine (and choline) into TMAO. This did not happen if the intestinal flora of the mice was suppressed with powerful antibiotics. In other words, bacteria did the transformation.

The researchers then took this information and did a study on a small group of 6 humans, including Hazen. They simply fed them all a juicy sizzling sirloin steak. They wanted to know if eating the steak would raise TMAO levels. The answer was YES! TMAO levels simply soared! But there was a single notable exception. One of them didn't get a TMAO burst. That person had been a vegan for more than a year.

*This peculiar finding was confirmed with additional research on 23 vegetarian/vegans and 51 meat eaters. The meat eaters had more TMAO in their blood. And, the meat eaters readily converted supplemental carnitine into TMAO. **The vegetarians/vegans did not make the risky conversion! And, the researchers admitted that they were shocked at this finding!***

Many researchers were quick to compliment the report. Dr. Daniel J. Rader, a heart disease researcher at the University of Pennsylvania School of Medicine, said, "It's really a beautiful combination of mouse studies and human studies to tell a story I find quite plausible." Dr. Frank Sacks is a professor of cardiovascular disease prevention at the Harvard School of Public Health. He called the findings impressive, saying, "I don't have any reason to doubt it, but it is kind of amazing." Lora Hooper, an associate professor of immunology and microbiology at the University of Texas Southwestern Medical Center is a paleo diet follower. Her comment about the study: "YIKES!"

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Of course researchers are already saying this will lead to new treatments for heart disease, perhaps including an antibiotic to wipe out the specific organism responsible. Regardless, TMAO may become a viable new blood test to assess your risk, and that test is in the works. I think the former (antibiotics) is ludicrous. What about the bacteria we rely on to make vitamin K and other key nutrients we need? On the other hand, a test for TMAO in your blood is a terrific idea.

*Of course, critical questions remain. Would people reduce their heart attack risk if they lowered their blood TMAO levels? An association between TMAO levels in the blood and heart disease risk **does not necessarily mean that one causes the other** [as detailed in chapters 2–3]. And which gut bacteria in particular are the culprits?*

There also are questions about the safety of supplements, like energy drinks and those used in bodybuilding. Such supplements often contain carnitine, a substance found mostly in red meat.

But the investigators' extensive experiments in both humans and animals, published April 8, 2013, in Nature Medicine, have persuaded scientists not connected with the study to seriously consider this new theory of why red meat eaten too often might be bad for people.

Folks, let me summarize these findings, and connect the dots for you in a manner you won't hear from these fine researchers. Hazen's group previously found TMAO to be a far greater predictor of heart disease than cholesterol. (Remember, I've repeatedly told you that the cholesterol theory just doesn't hold up. This may partially explain why.)

Their laboratory studies determined that TMAO enables cholesterol to get into artery walls and also prevents the body from excreting excess cholesterol. You might remember me repeatedly telling you that it's NOT cholesterol. It's what your body (or cooking or other handling) does to cholesterol.

*In this case, bacteria in your gut convert a nutrient molecule into a bacterial by-product. That by-product goes to your liver, which converts the by-product molecule into TMAO, a now proven **activator** of cholesterol pathogenesis. Vegetarians don't have this problem. Meat eaters do. And, their levels of TMAO "spike" upon presentation of carnitine either in meat or supplements. Vegetarians don't so spike. And, meat eaters given an antibiotic to temporarily wipe out their gut bacteria also did not spike. The elegant research proved that the culprit was intestinal bacteria feasting on the carnitine, and converting it to something you don't want in your body.*

Now, my comments. I also say "YIKES!"—but only on a positive note for all the heat I've taken for my dietary stands. Please remember the report I gave you on bacteria in your gut contributing to your weight. See, what you eat determines the kind of bacteria you harbor. Obese people are harboring bacteria that thrive on what they are eating. The problem for them is that these organisms further contribute to their obesity by enabling more calorie absorption from "foods" that would otherwise not be digestible. The bacteria certainly win that way. You don't!

Here we see that meat eaters are harboring an organism that converts readily available carnitine in meat to a nasty compound. Naturally, your gut will draw out and select those

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organisms if you are providing a fertile ground for them by regularly eating carnitine-rich meat. (Fish, chicken and dairy have carnitine but in lesser amounts.)

Now this fascinating work connects many dots. It explains why I rarely, if ever, see heart disease in vegetarians who eat high-quality food. It provides a crucial missing link into the debunked cholesterol hypothesis. TMAO is 10 times the risk of cholesterol! And, it can explain why we found heart disease in Egyptian mummies. Generally it was the rich who could afford the expensive mummification process. And throughout history, the wealthy have eaten red meat. It then might not have mattered that the Egyptians had little in the way of modern processed foods. Perhaps they also fried food as well. They did have olive oil!

So what reasonable action should you take? There are two questions raised: 1) what about meat in your diet, and 2) what about carnitine supplements? Three ounces of red meat provide 95 mg of carnitine. Pork has about a third of that, and fish far less. (I think pork is quite bad for other reasons. Its flesh is similar to humans, making digestion and elimination of similar toxins we carry a real problem.)

Supplements may contain as much or more carnitine than three ounces of red meat. But, I am not running from carnitine as a supplement at this time. Why? Because I believe that your gut flora are more dependent on what you eat than what you supplement. I've used carnitine myself from time to time. Mitochondria need it. And considerable research does support its benefit.

I have long believed that eating meat is not ideal for humans, especially when I look at our closest cousins in

nature—the great apes. We cook meat. Carnivorous animals don't. Muscle protein we eat is also different than the organ meat that carnivores prefer. The former is far more difficult to digest and absorb. Consequently, undigested flesh protein works its way through your gut, potentially provoking a feeding frenzy by some "bad" bacteria. Since we know that slender people have a far different bacterial flora than obese people, I suggest that meat eaters also have a different flora (as compared to vegetarians). This might lead to their higher risk of vascular disease.

Finally, consider the great carnivores. The lion, a larger mammal than us, has a digestive tract of only about 12 feet. Ours is about 30 feet. Seems the lion "knows" he better poop out protein digestion products more quickly than we humans, who retain intestinal contents far longer with our long gut.

I'm not suggesting that you totally eliminate red meat, nor have I in the past. I'm vegetarian for spiritual reasons. If you want your steak, have it, but please de-emphasize red meat as a primary food. (I wonder how many heart attacks our government brought on with its bogus "food pyramid" with meat at the top when I was growing up.) Consider having red meat once weekly or, even better, as a treat once every two weeks. A by-product of less meat consumption will be a far lower carbon impact on the environment. You can't imagine the environmental devastation occurring as large amounts of the Amazon forests are leveled to grow cattle feed or to raise cattle for human food.

As mentioned, poultry, fish and dairy have far less carnitine. Fish might be the best choice as it easily flakes, and may be the most digestible. However, you then run into the problem with the lack of labeling of the farmed/toxic fish and new "Frankenfish." And, fish can be highly polluted. So, just remember— moderation.

Please follow the Living Foods Diet 75% of the time. I don't care what you do with the remaining 25% so long as it is not fast, fried, refined or processed.

But now, I certainly feel I have more weight behind me in encouraging you to make red meat a minor portion of that 20%. Please remember that you first heard this paradigm in *Second Opinion*. I do wonder how my predecessor at SO will react to this news. He's been a long-term advocate of a meat-based diet. Many people to this day believe that we are getting all the vegetation we need by eating grass-eating cows, since it is grass that sustains them. Well, if cows are providing us all the vegetation we need, seems that our intestinal bacteria just haven't learned that yet.