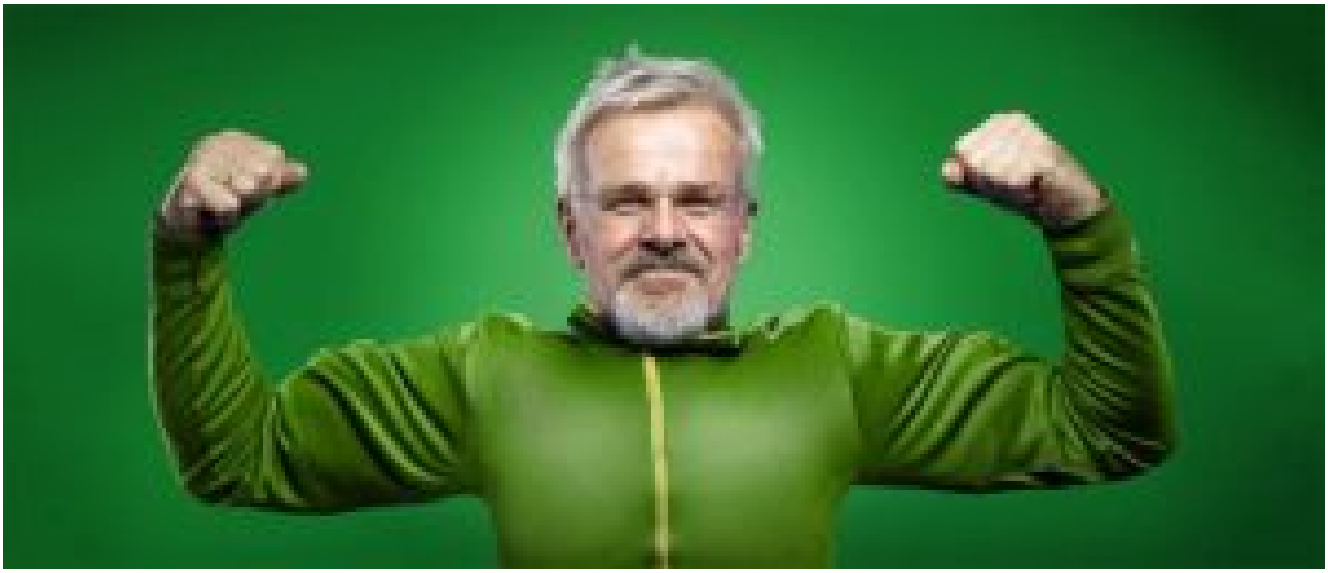
What is the Real “High Quality” Protein?



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WHAT IS THE REAL “HIGH QUALITY” PROTEIN?

Sometimes erroneous beliefs can become repeated, accepted and eventually acculturated. And there are several popular ideas about one nutrient in particular – protein – that certainly exemplify this.

Specifically, there are some oft-repeated but inaccurate beliefs about protein that are perpetuated by popular culture, the media, and even some within the medical establishment. Although we need many nutrients for our various complex physiologic functions, we seem singularly obsessed with protein. Even the term itself comes from the Greek word “proteius,” meaning “the important one.”

Further, we call animal protein “high quality protein” while we refer to plant protein as “low

quality protein". What is the meaning and relevance of these terms? Does "high quality" mean healthier or more nutritious, and "low quality" the opposite?

DEFINING PROTEIN

First, let's define exactly what a protein is. It's simply a chain of amino acids joined together by a peptide bond. When we eat food, our bodies digest the protein in the food, breaking the bonds that link the amino acids together. We then store the individual amino acids in a "pool," from which our bodies later draw to make brand new proteins for various functions (like cell regeneration or repair, creating enzymes, building muscle, etc.).

The term "essential amino acids" refers to nine particular amino acids that our bodies do not synthesize and we therefore need to get from food. Today, we know that, with few exceptions such as gelatin (which is an animal protein), most proteins from both animal and plant foods are "complete proteins" – meaning they contain all of the essential amino acids our bodies need.[1]

WHY IS ANIMAL PROTEIN CALLED "HIGH QUALITY"?

Are we understanding this term correctly?

Protein was discovered in the early 1800s, by a Dutch chemist. He isolated protein from meat, and therefore it was initially (but incorrectly) thought that protein was exclusively in animal foods. In the late 1800s, however, it was discovered that plants contained protein too. However, plant proteins were labeled "incomplete", as it was believed (again incorrectly) that they lacked all of the essential amino acids.

Today, of course, we know that most proteins from both plants and animals are “complete proteins” (meaning they contain all of the essential amino acids we need).[1] However, the term “low quality” is still used to refer to plant proteins because they typically have a *lower proportion* of these essential amino acids as compared to animal proteins.

But it’s important to understand that having a *higher proportion* of essential amino acids, as animal protein does, is actually problematic (not advantageous) for our health, as are many other attributes of the animal foods with which animal proteins are packaged.

SEVEN SERIOUS PROBLEMS WITH ANIMAL PROTEIN

1. Animal Protein and IGF-1 / Increased Cancer Risk

When we ingest proteins that have a higher proportion of the essential amino acids (which is a characteristic of animal protein), it results in our bodies producing higher levels of the hormone IGF-1 (insulin-like growth factor-1).[2 – 8]

This hormone stimulates cell division and growth (in both healthy and cancer cells), and for this reason, having higher circulating levels of IGF-1 has been consistently associated with increased cancer risk, proliferation and malignancy.[2 – 8]

2. Animal Protein and TMAO

Consuming animal protein also results in us having higher circulating levels of trimethylamine N-oxide, or TMAO.

TMAO is a substance that injures the lining of our vessels, creates inflammation, and facilitates the formation of cholesterol plaques in our blood vessels. And that, of course, is highly problematic for cardiovascular health.[9 – 10]

TMAO is created by complex interactions involving our gut flora and the nutrients in the food we eat. And when we eat animal foods, it alters our gut flora in such a way that facilitates the creation of TMAO.[9 – 10]

So, consuming animal foods result in higher TMAO levels, which is damaging to our vessels. Even without all of the other problematic aspects of animal foods, this one issue involving TMAO is, according to the recent president of the American College of Cardiology Dr. Kim A. Williams, sufficient by itself for people to vigorously avoid animal foods.[11]

3. Animal Protein and Phosphorus

Animal protein contains high levels of phosphorus. And when we consume high amounts of phosphorus, one of the ways our bodies normalize the level of phosphorus is with a hormone called FGF23 (fibroblast growth factor 23).

FGF23 has been found to be harmful to our blood vessels. It can also lead to hypertrophy of the cardiac ventricle (abnormal enlargement of our cardiac muscle), and is associated with heart attacks, sudden death and heart failure.[12 – 13] So eating animal protein with its high concentration of phosphorus can result in increased levels of this hormone in our bodies, which in turn is highly problematic for our health.

4. Animal Protein, Heme Iron and Free Radicals

Iron is the most abundant metal in the human body. We can consume it in two forms: (a) heme iron, found widely in animal foods like meat, poultry and fish, and (b) non-heme iron found widely in plant foods.

One of the problems with heme iron is that it can convert less reactive oxidants into highly reactive free radicals.[14] And free radicals can damage different cell structures like proteins, membranes and DNA.[14 – 15]

Heme iron can also catalyze the formation of N-nitroso compounds in our body, which are potent carcinogens. So, not surprisingly, high intake of heme iron has been associated with many kinds of gastro-intestinal cancers as well as other pathologies.[15]

It is true that heme iron has higher absorption rates and bio-availability than non-heme iron. However, iron itself can cause oxidative stress and DNA damage, so with iron generally, it’s not always a situation where “more is better.”[15]

While we definitely need iron, the absorption and bioavailability of iron from a well-rounded plant-based diet is generally adequate, and we may avoid the problems associated with heme iron and other negative health attributes of animal foods.[16 – 17]

5. Higher Sulfur-Containing Amino Acids and Bone Health Problems

Animal proteins also have, in general, higher concentrations of sulfur-containing amino acids,

which can induce a subtle state of acidosis when we metabolize them in our body.[18] One of the mechanisms our body uses to compensate for this acidosis is leaching calcium from our bones to help neutralize the increased acidity. Over time, this can have a detrimental effect on bone health.[19 – 24]

This is thought to be one of the reasons why some studies have found that populations with higher dairy consumption, as well as higher consumption of animal protein in general, also have a higher incidence of bone fractures.[18 – 30]

6. Animal Protein and Cholesterol

Most animal foods contain saturated fat and cholesterol (this is true for even so-called “lean” meats like chicken, turkey and salmon, regardless of how they are cooked or prepared – even if boiled, baked or steamed).

As humans, we do not need to consume any cholesterol, since our bodies synthesize all the cholesterol we need for our physiologic functions.

Eating cholesterol despite this fact is problematic for our health, as it increases our risk of developing heart disease – currently the number one cause of death for both men and women in the US.[31 – 37]

Atherosclerosis, or plaques of cholesterol that accumulate in the lining of our vessels, is exquisitely less common on a plant-based vegan diet devoid of animal products. And, some studies have found that eating this way can even reverse atherosclerosis.[32 – 37]

7. Animal Protein and Fiber (or total lack thereof)

Unlike plant protein, which comes packaged with fiber, antioxidants and phytonutrients, animal protein comes with exactly none of the foregoing. To this point, meat, eggs, poultry, dairy, fish and other animal foods have absolutely no fiber whatsoever.

Many people, in their effort to "get enough" protein, tend to eat large amounts of animal foods, which displaces plant foods that have these important nutrients. Fiber deficiencies, in particular, are far more common than not.

For example, The Institute of Medicine recommends that men consume 38 grams of fiber, but the average adult only eats about 15 grams per day – less than half the recommended amount. In fact, according to the USDA, almost all Americans (~95%) do not get an adequate amount of dietary fiber.[38 – 39]

High fiber intake is associated with decreased cancer risk, specifically colon and breast cancers, as well as lower risk of ulcerative colitis, Crohn's disease, constipation and diverticulitis. It may also reduce the risk of stroke, high cholesterol and heart disease.[40 – 41]

CONCLUSION

Given all the issues, the "high quality" aspect of animal protein might be more appropriately described as "high risk" instead.

And there's no need to obsess about getting enough protein either. If you are eating a sensible variety

of plant foods (vegetables, fruits, legumes, grains, roots, nuts and seeds), and you are eating enough calories (you feel satisfied), there is no need to worry about protein adequacy.

The amino acids we need are structurally identical regardless of the source. However, as discussed above, there are serious health implications depending on whether the amino acids are packaged with animal or plant foods. Dr. Walter Willett, the chair of Harvard's Department of Nutrition, said it well:

> "To the metabolic systems engaged in protein production and repair, it is immaterial whether amino acids come from animal or plant protein. However, protein is not consumed in isolation. Instead, it is packaged with a host of other nutrients."[42]

He therefore recommends that you "[p]ick the best protein packages by emphasizing plant sources of protein rather than animal sources[.]"[42]

In the end, plant foods are the ***real*** "high quality" foods that we should be eating for optimal health.

(*Please select the "Sources" tab above to view the footnotes.*)

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