

Plant-Based Meat Products

Back to the fundamentals

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There is no such thing as ‘simple’ when it comes to nutrition. More than 30 years of working in this field have taught me that important lesson. Be wary of ‘simple,’ ‘JUST’ (*pun intended*), ‘only,’ ‘one-size-fits-all solutions,’ and the promise of yet more ‘magic bullets’ ...

Don’t be too quick to judge, don’t be too eager to be appalled, don’t be too keen to rely on any information that is being fed to you. Not yet, at least. Take your time to understand the gaps that need to be addressed. I give myself this advice every now and then, and especially when a sensational headline comes to my attention. And let’s be honest, we haven’t been exactly sheltered from those lately! My in-box has been jammed to bursting with screaming headlines that orbit a topic about which I care deeply – namely, the role of protein in human nutrition and its rightful place in our diets in the context of an environmentally challenged planet.

From Impossible Foods to Beyond Meat and JUST products (you name it!), there seems to be an endless welter of ‘nutritious’ plant-based products coming onto the market. Innovations in food technology have made these alternatives taste like meat or eggs – a quantum leap compared with what was called TVP (textured vegetable protein) by Archer Daniels Midland (ADM) in the 1960s, and was made from soya protein. However, the flavor and mouthfeel of TVP didn’t make it a product that consumers aspired to eat.

The new generation of plant-based alternatives has been fueled by ‘cheap money’ and an unprecedented availability of venture capital to fund innovations in food – not in nutrition. Impossible Foods, for instance, has raised more than US\$750 million from a long list of institutional and celebrity backers including Bill Gates, UBS, Google and Khosla Ventures along with Serena Williams, Katy Perry, Jay-Z and Trevor Noah, to name but a few.

While this may sound promising to some, the unsavory truth is that these food innovations may not in fact be as healthy as they would like to appear. This shouldn’t come as a surprise to us, as the development of these foods was never really about *health*. You can’t fool even the least nutrition-conscious individual about the true nature of these highly processed vegetarian or vegan products. To make no mention of the high levels of sodium, saturated fats and food additives they contain, or their prevailing lack of essential micronutrients.

Clearly the appealing marketing message was about finding alternatives to meat for the sake of the environment and not our health, and rightly so: if we are looking to mimic the complete sensory experience of meat and meat products, we must accept that in the course of this journey unforeseen trade-offs may exacerbate the already existing dilemma of empty calories in our diets.

On the other hand, the EAT-LANCET report has significantly contributed to this growing debate, and despite the criticism it has endured from the nutrition community (and justly so in some instances), I welcome the way it has spurred discussion on this topic.

So, are meat alternatives an opportunity or a threat? More of a *missed* opportunity, I would argue. The fact that the companies that produce them are addressing only one side of the problem is a completely missed opportunity. We urgently need to rigorously scrutinize the nutritional effects of these new meat alternatives. To date, no efficacy trials have assessed the nutrition and health effects of plant-based meat products such as Impossible Burger or Beyond Burger compared with those of real meat. And if the nutritional component is weak, that’s when the real work needs to begin.

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There is much to learn from the way sources of protein other than meat have been researched and are still in the process of



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Researcher inspecting a meat sample in a laboratory. Finding a replacement for all the beneficial nutrients that are obtainable from animal-source foods is not a ‘quick fix’

thoroughgoing analysis. Take the example of insects – was that all merely hype? By no means. First, however, a list of important research questions needs to be addressed in order to guarantee the safety of the product; and second, the product’s contributions to nutrition must be better understood.

Findings from a recent study conducted by Melse-Boonstra et al.¹ – the first that looked into the bioavailability of minerals from edible insects in humans – points to the need for further investigation into the anti-nutritional properties of insects *before* promoting them as an alternative source of iron. The iron bioavailability of recombinant soy hemoglobin in the human diet (you have correctly noticed the Impossible Burger’s key ingredient for making it taste, look and feel like meat – and made, incidentally, by a genetically modified organism) was only tested some 15 years ago in Caco-2 cells, which are human intestinal adenocarcinoma cells that have been used for nonheme iron bioavailability studies. At the time, the study’s objective was to *introduce* the concept of using plant hemoglobin as a heme iron source in human diets and to promote further research in this area.²

Today, this is still the only piece of research we have in the area of soy hemoglobin iron bioavailability, but alternative meat products of this type are still hitting high-end restaurants

and chains, and are already available in supermarkets. What is perhaps even more worrying is the fact that heme iron is one of the candidates for why high amounts of beef and other red meats might cause cancer. To this day, we do not fully understand how red meat increases the risk of cancer, and on the basis of that ignorance, salving one’s environmentally challenged conscience by doubling the consumption of heme iron from soybean in the form of a processed plant burger is not exactly recommended ...

By the way, the Beyond Burger, with a supply of micronutrients that is close to zero, has an even longer way to go.

So, if you’re looking for an environmentally conscious alternative to eating meat, look no further, and have that burger! (Although be warned that unknown externalities are most likely to surface once you get really stuck into it.) However, if you’re looking to find a replacement for all the beneficial nutrients that are obtainable from animal-source foods – such as bioavailable iron and zinc, vitamin B₁₂, essential amino and fatty acids, selenium and choline – then I *urge* you to think again. Likewise, if you’d simply rather not put your health at risk because of the unknown or unstudied consequences of these novel types of food, then the simplest answer to your question may be the practice of moderation.

So, are meat alternatives an opportunity or threat? Maybe a little bit of both – but before we go on, there are more fundamental questions to address that are currently not receiving sufficient attention.

I believe that significantly more attention should be given to the question of *how* workable alternatives to meat might be developed. Dismissing the inevitable marketing speak about ‘flavor,’ ‘texture,’ ‘umami’ and ‘mouthfeel,’ let us start with the proposition that the nutritional composition of any meat alternative should mirror the nutritional composition of the meat it is designed to replace. This might never be entirely technically feasible, but it should be an aspirational starting point. For if the experience of the past 50 years has taught us anything about nutrition, it is that we do not need yet more empty calories being produced in the factories of the rich and foisted on consumers via a food system that is designed to serve the makers of food, and not the individuals who consume it.

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My view is that everyone involved in the development of potential meat alternatives – funders, researchers, producers, distributors and marketers – has a deep responsibility. Our society has produced enough bad food. We know exactly how to do it, and we do it very well. What the world urgently needs are models for the production of alternative protein sources that are not only sustainable, and not only ethical, but above all nutritious. A rich nutrient profile with a minimum of processing should be the aspiration of everyone engaged in the search for viable meat alternatives. And it is the job of nutritionists to get the attention of the world on this matter.

The most important issue that remains to be addressed in all this is the potential risk that consumers face. ‘How to put consumers at the center?’ is a question that drives our work at *Sight and Life*. We know that people make irrational choices about food and that information isn’t everything. Not only is it hard to translate science into layman’s language; it’s even harder to change behavior by rational argumentation alone.

This new edition of *Sight and Life* magazine sheds light on the range of complexities, intricacies, inspirations and innovations that surround consumer insights. The time has come to turn the tables and take ownership of a field that has far too long served up cheap and empty calories rather than nutritional wellbeing.

Welcome to the world of Consumer Insights for global public health nutrition, where Science extends a hand to Art to unravel the complexities of human behavior in a world whose resources are, as we are all coming to acknowledge, very finite.

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