PROTEIN: REBALANCING OF ALTERNATIVES

By Henk Hoogenkamp

When it comes to protein, consumers have a lot to choose from. Globally speaking, soy protein is by far the largest source of plant-based soy protein, and unique alternative sources -including pea protein and mycoprotein- are gaining traction. For some plant protein ingredients, infrastructure, investments, and production capacity, including extrusion facilities, the supply chain has not kept up with the fast-growing consumer demand. A rebalancing between the animal-protein market and the plant-based protein consumer market is now in full swing and this is especially the case in the affluent societies.

There is no question that the harvest needs to transform plants into premium and sustainable protein foods to nourish the world. Preferably, this needs to be accomplished keeping the protein as natural as possible, i.e. minimizing the use of harsh chemicals to isolate the protein, as well as looking at alternative methods such as dry fractionation. Plant protein ingredients like those derived from legumes, cereals, vegetables, and fruits are now rapidly transforming into valuable functional and nutritional cost-effective ingredients in a plethora of food products. Good protein ideally should possess a handful of properties and characteristics: stellar nutrition, great flavor, color, process adaptability, versatility, and performance in more ways than one.

The behavior and interactions between proteins and their blends are of great importance to a wide range of applications in food, biotechnology, biomedicine, and cosmetics. Protein derived from natural plant sources, such as soy, wheat, pea, rice, mung bean, chickpea, fava bean, corn (zein), potato, sunflower, rapeseed (canola), and algae has all that and more.

The bottom line is that consumers should be encouraged to have diets that are less energy-dense, allowing a larger natural food intake with essential nutrients like plant proteins, healthy oils, vitamins, and minerals.

Meat Rules Protein

There are multiple reasons as to why meat consumption is steadily

declining in affluent societies. For the aging population, health is usually cited as the main reason, while the sub-30-age groups favor different lifestyle choices with meat playing a less dominant role as center-of-the-plate food.

In addition, the twin effects of time-pressed lifestyles and tight budgets are the main reasons that consumers living in affluent societies are shifting away from traditional home-cooked center-of-the-plate, whole muscle-meat cuts, and switching to semi or fully prepared natural, wholesome dietary-sound options. It is clear that meat is increasingly looked upon as an ingredient or as a small part in a side dish.

"Sustainability Tax to Promote Health"

The potential downside risks for meat companies are the likely physical impact of climate change and the rapid growth of alternative protein formulated foods. Key risks to the meat industry include increased cost of energy (electricity) due to carbon pricing, higher costs of animal feed due to poor crop yields, and increased livestock mortality due to heat stress, as well as increased costs for clean water processing and its recycling.

A growing number of people believe that the world is moving towards a slaughter-free future. It is likely that governments in some affluent or developed countries will try to flatten the curve of meat consumption. A "sustainability charge", not a "meat tax", will likely be instilled to reflect its environmental costs, including CO2 emissions, and biodiversity loss. All this will be done to encourage and incentivize the consumers to increase the consumption of plant-based foods.

An emerging argument is that animal agriculture is the leading cause of climate change, species extinction, deforestation, habitat loss, pollution, and diversion of clean water needed for human use.

In the hierarchy of the meat pyramid, beef takes the number one spot of having the highest environmental costs per kilo of meat, followed by pork, while poultry has the lowest costs. Another assumption that is increasingly highlighted is the notion that if meat consumption reduces and plant-based nutrition rises, healthcare costs will also reduce.

Baseline Knowledge

When extrapolating 2021 baseline knowledge to 2050 feed and food availability, it can be concluded that the projected increase of ruminant meat and dairy consumption will not be able to keep emission levels within agreed targets, unless major technology improvements occur and are implemented. Hence, based on today's state of technology, it can be predicted that meeting climate targets may require forced reduction in the future of meat and dairy consumption. In reality, this specifically means an increase in per capita consumption in the developing world and a much-needed decrease in affluent societies. However, realistically speaking, this is not going to happen anytime soon.

A Moving Target:

The new US dietary guidelines (2020-2030) back off from strict sodium rules, reverse previous guidance on the dangers of dietary cholesterol, and add strict new advice to cut back on added sugar.

Apart from these guidelines, the new dietary advice can be summarized as an environment-friendly diet, lower in red meat and processed emulsified meats, and de-emphasizing the role of lean meats

in the list of proteins that are part of a healthy dietary eating pattern. As a strategy to increase the variety of protein foods, consumers are advised to increase consumption of seafood, vegetables, fruits, seeds, and nuts.

About 60 percent of EU and UK adult citizens are living with one or more diet-related chronic diseases. Without much needed critical dietary reforms, it will be difficult to reverse the current obesity epidemic of disease that is causing great suffering and early deaths.

Most affluent dietary guidelines are not compatible with global health and environmental targets. Science-based guidance, not dietary fads, is critical to ensuring a healthy future across a person's lifespan. It is a fact that the typical affluent citizen overconsumes total energy, saturated fats, sodium, added sugars, as well as alcohol beverages. Intakes of fruits, vegetables, nuts, and whole grains are still lower than the recommended dietary guidelines. Together with these lower consumptions, there is also an underconsumption of calcium, vitamin D, fiber, and potassium, which can be seen as a significant public health concern. Furthermore, there is a growing number of vegans who suffer from vitamin B12 deficiency.

It should also be noted that reducing saturated fat intake and replacing it with unsaturated fats -particularly polyunsaturated fat- lowers the incidence of cardiovascular disease in adults by decreasing serum of total and low-density lipoprotein cholesterol. However, the latter science is debated in new scientific dairy studies which have concluded the benefits of dairy foods on chronic disease risks at all fat levels.

Emissions

Carbon dioxide emissions from energy and transportation currently take the largest share of climate pollution. On the heels of energy and transportation come the emissions from agriculture, which will continue to increase to keep pace with the significant projected growth of global meat and dairy consumption. It will be necessary to address these increases because without adequate actions implemented, nitrous oxide from the field and huge methane emissions from livestock may double by 2050, if not sooner.

There is no question that the growth of meat production is intimately associated with many ecological issues. It is safe to predict that meat and ecology are on a collision course. The huge requirements of fresh water for meat producing animals, most especially, could eventually have a catastrophic impact on the environment. The world needs to make hard choices and will, at some point, be forced to accept a diet with less animal protein.

Conventional beef production by means of raising animals for a quickly rising world population requires enormous levels of energy, feed, and water expenditure. These factors are damaging the ecological environment and will, ultimately, prove to be unsustainable. In addition, traditional beef production is a time-consuming process that has a high impact on carbon emissions, not to mention the huge amounts of methane released into the air. Methane gases released by cattle are very damaging for air quality as agriculture is responsible for an estimated 15 percent of the world's greenhouse gases. A significant portion of these methane emission pollutants is 23 times more powerful than carbon dioxide. Cows emit a massive amount of methane through belching and a lesser amount through flatulence. These ruminant animals have four stomachs and digest feed in their stomachs instead of their intestines. The bacteria that aid digestion in these stomachs produce most of the methane. It is therefore fair to ask the question: Is large-scale agriculture-driven cattle farming sustainable in the long term?

The obvious solution is to develop improved genetics of livestock and embrace cell-cultured meat, insect protein extraction, and great-tasting plant-based protein foods like plant-meat and plant-milk. Consumers should be encouraged to eat more plant-based protein foods not only to improve their nutritional status, but also to proactively relieve the unrelenting increase of world's demand for slaughtered meat and overreliance on traditional dairy.

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