



A sugar, fat and salt-laden diet will lead to health problems. Photo: imago images / ZUMA Wire

Plant proteins are not a self-evident fact

Shifts to more protein-rich diets and a growing demand will exceed sustainable supply capacities

Looking into the crystal ball, there is little doubt that “protective foods” like vegetables, beans, fruits, whole grains, plant oils, fish, and dairy yogurt will gain traction to not only help improve diet quality and health, but also maintain or improve global sustainability and food security.

By Henk Hoogenkamp

The need to feed a growing number of people globally has resulted in widespread environmental degradation and loss of biodiversity, affecting about 25% of global soil. Shifts to more protein-rich diets in developing countries and a growing demand will ultimately exceed sustainable supply capacities.

Protective foods echo a positive lifestyle message for people to become proactive in their search to avoid existing, looming or future degenerative diseases and improve wellbeing. After all, especially in affluent and developed societies, an increasing number of people are much more ill than is generally

acknowledged. For example, in the US – with a population of some 330 mill. people – more than 100 mill. adults have diabetes or pre-diabetes. Not to mention that about 112 mill. people have pertinent looming cardiovascular disease issues, which cause about 840,000 deaths each year. This number means approximately 2,300 cardiovascular related deaths each day. Knowing that three in four adults in the US are either overweight or obese proves that more Americans are sick than healthy.

If these trends continue to move forward, a healthcare spending disaster is bound to happen and costs will keep rising as the population ages with technology keeping sick people alive longer. This does not even take into account catastrophic world disasters such as the Covid-19 crisis.

Climate-smart foods

Transitional change across the entire food chain will be needed for feeding a future global population of ten billion people. Climate

change might present various threats to both human and planetary health and thus create risks to food security, i.e. negative impact on crop yields. Changes in climatic conditions are already impacting harvests such as rice, corn, cassava, pea, wheat, sugarcane, and sorghum. Also palm oil yields are markedly down in some harvest regions. The impacts vary by crop type and regional situation which might hit food-insecure countries hardest.

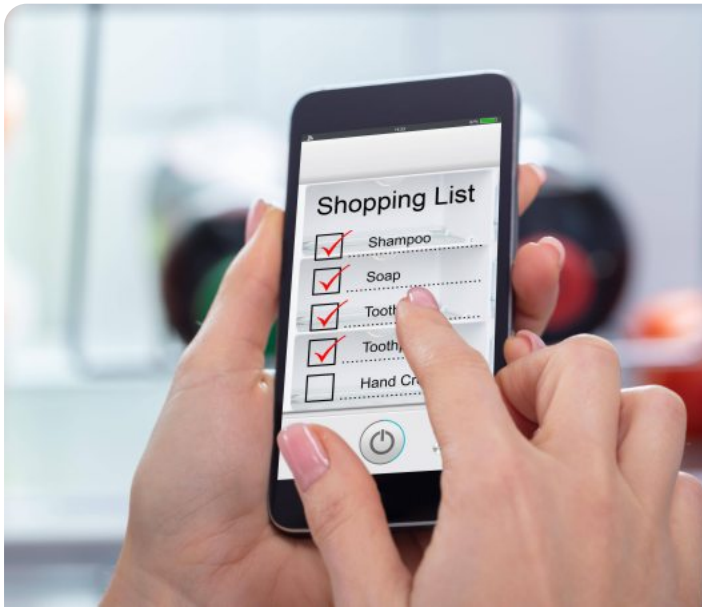
Guiding apps

Perhaps the only way to manage the uncontrollable healthcare costs is to proactively engage in physical activity and switch from a sugar, fat and salt-laden hyper-processed poor food intake to that of good-tasting yet nutritionally endorsed meals (also known as personalized nutrition) for improved wellbeing and an electronic tracking app for the best possible food intake options.

Emphasizing protective foods also means that taxes on sugary or salty snacks and junk food basically need to be paired with govern-

ment subsidies on generally recognized healthy foods. The food industry should make a uniform effort to reduce or eliminate harmful additives like trans fats, added sugar and sodium, as well as many more “chemicals” often hidden as “processing aid” and used primarily for process modulation or stimulating overeating and compulsive snacking.

The use of chemicals and unsustainable additives or ingredients can lead to a variety of issues for both short term and long-term consumer health. Also, variables such as sustainability issues are now deeply embedded reaching the entire supply chain from agriculture to food processing and ending at the supermarket shelves. Increasingly, the sub-30-age consumers want to know not only what is in a product with simple-to-understand ingredients, but also how it benefits their health and wellbeing. However, sustainability not only concerns counting carbon credits but also encompasses ethical and social values, and often its role in peer-dominated social media groups.



An electronic tracking app for the best possible food intake options may help in personalized nutrition for improved wellbeing.

Photo: imago images / Panthermedia

For example, quite a few food companies have remade their portfolio to include fewer artificial or synthetic additives and instead use natural ingredients to match the wholesome trend. Nondairy yoghurt versions made out of a coconut base and other plants have grown rapidly, and its major advantage is significantly less (lactose) sugar than traditional all-dairy varieties. Health-oriented startups and even cheaper own-label branded low-cost supermarket choices like AH, Aldi and Lidl are broadening these categories even further and damaging the status of decades-old dairy yoghurt brands.

Since most governments play a crucial role in national health and medical budgets, it seems logical to expect that incentives for healthy eating need to be part of the consumer awareness of these issues. Specifically, there must be communication of the direct link between food intake and health issues ranging from high blood pressure, gut microbiome related problems, allergies, autoimmune disorders, brain health, cancer and high LDL / low HDL levels.

If no corrective nutrition action is taken, the human medical and economic costs will continue to spiral out of control and ultimately destroy the global democratic health-care systems that have very well served most of the developed world.

Too few real choices

The human diet is not as diverse as it sounds. Seventy-five percent of all food intended for human consumption comes from just 12 plants and five animal species. Four of the world's crops – rice, corn, soy and wheat – provides a staggering 70% of the human energy intake.

At present, 30,000 varieties of fruits, vegetables and edible plants are not produced for human consumption. Many traditional foods have simply disappeared and fallen off the radar. Come to think of it, the few generations from the Second World War up to 2020 have gone from traditional eating habits to unhealthy eating. This trend needs to be reversed for the benefit of humans, and the health of the planet.

The world in food transition

The "Green Deal", announced and supported by the EU Commission in December 2019, aims to ensure that the Union will be climate neutral by 2050. This transformation is easier said than done for it will require major efforts by all parties concerned on finding ways to cut emissions, restore the health of the natural environment, protect habitat and wild life, improve biodiversity, create new economic opportunities, and improve the quality of life of its citizens. For agricultural practices alone, this

will mean significantly reducing the use and risk of chemical pesticides, as well as the use of chemical fertilizers, hormones, antibiotics, and an agreed-upon GMO-platform.

Sustainability is global responsibility for environmental soundness, long-term profitability and prolonged economic prosperity. These words are even more significant in a rapidly increasing world population with more people moving up the food chain and consuming grain-intensive animal proteins such as slaughtered meat and dairy. Arguably, it will be just a matter of time before a major disruption in food supplies will occur.

Looking at both the global population growth and the accelerating environmental issues, there is no doubt that the collective food industry needs to embrace a fourth agricultural revolution. It will be important to alleviate poverty and scarcity, secure investments to combat waste, pollution, and emissions. In order to meet those targets, it will be essential to allow technological developments, such as artificial developments and robotics for crop yield improvement on traditionally farmed land to maximize growth. Closely associated with yield efficiency will be the evolution of development of plant varieties which are more resistant to disease as well as less reliant on chemical protection and chemical fertilizer. The latter will also include vertical farming systems to minimize agricultural land use to limit environmental externalities growing certain vegetables in climate-controlled environments in terms of temperature, moisture, and nutrition standards.

Even now, some areas of the world can be seen as inhabiting a "food bubble," the result of using unsustainable agricultural methods like over-pumping groundwater in order to keep farming yields at unrealistically high levels. Moreover, the rapidly changing consumption patterns, the growing world population, as well as the depletion of natural resources pose real challenges for future generations.

In 2020, the global meat production is expected to increase by a staggering 720,000 t. Fast forward, with the demand for meat going through the roof, the world will not be able to address this by continu-

ously increasing the slaughter of animals to satisfy dietary needs.

People, food and biodiversity

While meat and dairy provide about 18% of calories and 37% of protein, it uses approximately 83% of farmland and produces an estimated 60% of agriculture's greenhouse gas emissions. It is obviously a gross oversimplification, but avoiding all meat and dairy products is the single biggest way to reduce the environmental impact on the planet. In theory, without meat and dairy production, global farmland can be reduced by 75% – an area equivalent to the US, China, Australia and the EU combined. In such a model, not only greenhouse gas emissions but also freshwater withdrawal, water pollution (eutrophication) and air pollution (acidification) need to be taken into consideration. An additional important variable is the fact that, generally speaking, animal-based foods have a significant higher protein density and a premium amino acid pattern compared to plant-based nutrition. These variables make straight nutritional comparisons between plant and animal difficult to implement.

Quite a significant part of today's agriculture combines a multitude of environmental issues. The current methods to produce, consume, and waste food is unsustainable. It is far-stretched and unrealistic to expect people to become vegetarian or vegan overnight, but simply adhering to a flexitarian or hybrid diet – less meat and dairy consumption – will make both the world population and the planet healthier.

Clearly, there is an agricultural imbalance in using its resources and over-producing some foods while under-producing others. Seen from a different angle, wheat, rice, and corn account for over half of the world's calorie consumption, and these crops are grown in relatively concentrated geographical areas: US, Canada, Brazil, Russia, and Ukraine. It is obvious that the current food production is reliant on land-based agriculture, which increases the vulnerability of food supply security. Increased production of the main crops is usually at the expense of biodiversity. Furthermore, most of the main crops are calorie-rich but nutrient-poor. These variables are also contributing to the global obesity crisis.

Plant pests and diseases

Prevention is always better than cure. In the mind of a consumer, plant protein sounds healthier than vegan or vegetarian. The marketing terminology is important to communicate the virtues of food, especially when health issues are involved.

According to the FAO (4 December, 2019) plants make up 80% of the food eaten and produce 98% of the oxygen globally. Yet, people still have the habit to take "food plants" for granted. For the majority of consumers, food crops lost to disease and pests is only an afterthought with little or no consideration of lost nutrition for millions of people living in poor (rural) communities.

Reducing plant biodiversity coupled with climate change and

human interference are the main causes for altering the ecosystem and thus, create an environment where pests and diseases can thrive. Managing plant disease is a lengthy and time-consuming process, as well as considerably expensive and often impossible to eradicate. Proactively keeping plants free from pests and diseases strengthens ecological sustainability and provides increased food security for millions of people facing hunger.



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JRS

Texture makes the difference

With a rise in the vegetarian and vegan lifestyle trend, consumers are increasingly looking for meat alternatives. Not only do they want these alternatives to be delicious and healthy, they also want them to have the same texture and bite as real meat. This is where JRS and their broad portfolio of Vitacel and Vivapur meat alternative fibers can offer solutions.



The production of chicken nuggets with additives.

Photo: Screenshot JRS

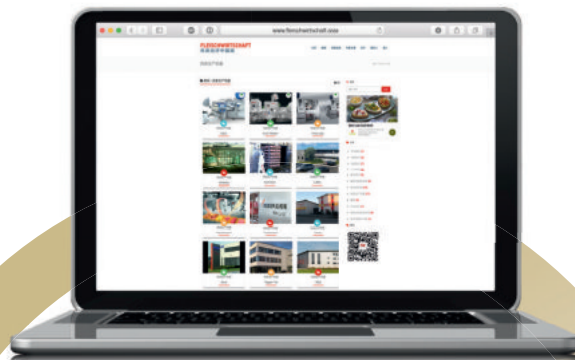
By using Vivapur Functional Ingredients and Vitacel Dietary Fiber customers can develop meat alternatives that have a realistic meat texture while bringing a nutritional benefit to your product. The JRS Team provides development support for any meat alternative to shorten the time to market. Vivapur MC is a key ingredient in producing meat alternatives, and a first choice for vegan

patties and numerous vegan sausage products. The heat reversible gelation results in outstanding water retention, sustained juicy mouthfeel, and good shape stability, whilst also reducing cooking losses. Under cold conditions, the ingredient works as a binder and an emulsifier of water/oil mixtures.

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