



# Perspectives.

Issue No. 39

## Healthy food for all

How do we make healthy  
diets accessible and  
affordable for all?  
A framework for action





# Executive Summary

More than one-third of the world population is overweight or suffering from hunger,<sup>1</sup> proving that our current food system is inefficient and needs urgent transformations.

Unhealthy diets exact a high health cost, cause environmental destruction, increase the risk of pandemic outbreaks and lead to massive greenhouse gas emissions and global food insecurity. That is why a shift towards more resilient, healthy and climate-friendly food-systems is urgently needed. This is especially true for countries in the Global North,<sup>2</sup> where diets rely excessively on animal-based proteins.

Unfortunately, healthy diets are neither accessible nor affordable for more than half of the world population. **Governments, the private sector, farmers and consumers must all take action in order to implement transformative and ambitious changes in the food system. A shift to more plant-rich diets and more sustainable agricultural practices is a crucial condition to achieving the SDGs and the Paris Agreement.**<sup>3</sup> This is only realistic if ample financial incentives from governments and the private sector also are in place to help farmers and food producers transition to resilient, healthier and more climate-friendly practices. Furthermore, a greater emphasis on providing information and transparency to consumers, so they can make informed decisions, is crucial to allowing them to play their role in supporting a new, fairer food system.

## Disclaimer

A United Nations Environment Programme (UNEP) publication series that presents views from major groups and stakeholders of civil society or about issues that are relevant for them.

PERSPECTIVES is coordinated by UNEP's Civil Society Unit. The presented views are entirely those of the authors and do not necessarily reflect the views of UNEP.

## Contact address

Civil Society Unit  
Governance Affairs Office  
United Nations Environment  
Programme (UNEP)  
unep-civilsociety@un.org

<https://www.unenvironment.org/civil-society-engagement>

November 2020

**Cover Photo:**  
© Pixabay

# Introduction

As the world continues to battle the COVID-19 pandemic, while also facing urgent nutritional, climate and environmental challenges, calls for radical transformations in our food systems and economies are rising from civil society and beyond.

The latest *State of Food Security and Nutrition* (SOFI), co-published by various UN agencies, including the Food and Agriculture Organization (FAO) and the World Food Programme, revealed many disturbing facts. By 2014, for instance, the number of people affected by hunger was estimated to be around 690 million people - or 8.9 per cent of the world population.<sup>4</sup>

While the current food system is failing to feed everybody, it is also making a substantial part of the world population sick, with around 1.9 billion adults and 340 million children worldwide classified as either overweight or obese.<sup>5</sup>

The ways that we are producing and consuming our food also has enormous impact on global biodiversity and is not compatible with the requirements for fulfilling the Paris Climate Agreement.<sup>6</sup> As for the Sustainable Development Goals (SDGs), the overwhelming majority of analysis and research attests that we are now clearly off-track from achieving SDG 2 (zero hunger) by 2030. This confirms what many people have claimed for years: our current food system is broken and needs to be urgently and radically transformed in order to allow

more people to follow healthy and sustainable diets.

The COVID-19 crisis has demonstrated the link between animal-sourced proteins and the unleashing of potential global health disasters.<sup>7</sup>

The COVID-19 outbreak has demonstrated the link between our food-system and pandemics, as UN Environment identifies the “increasing human demand for animal protein” and “unsustainable agricultural intensification” as two of the seven key human-mediated disease drivers.<sup>8</sup> Food choices can either exacerbate, or mitigate the risk of another global-health crisis.<sup>9</sup>

Solutions and sustainable innovations are available to shift dietary patterns towards a model that is better for the health of individuals, communities and the planet. Governments, farmers, the private sector and consumers can make that change happen by cooperating, starting immediately and pledging to leave nobody behind.

## 1. Unhealthy diets have higher hidden costs

### What is a healthy diet?

There are different definitions of a healthy diet, and these may vary across different regions and cultures. However, according to the World Health Organization (WHO), key elements of a healthy diet for adults include (per day)<sup>10</sup>: (like the picture below)

- High consumption of fruits, vegetables, legumes, nuts and whole grains
- At least 400 grams (or five portions) of fruit and vegetables per day
- Less than 10 per cent of total energy intake from free sugars
- Less than 30 per cent of total energy intake from fats
- Less than 5 grams of salt

Balanced, healthy-diets are key to preventing numerous diseases. According to WHO, “Consuming a healthy diet throughout the life-course helps to prevent malnutrition in all its forms, as well as a range of noncommunicable diseases (NCDs) and related conditions.”<sup>11</sup> WHO also notes that increased production of processed foods, rapid urbanization and changing lifestyles have led to a shift in dietary patterns. People are now consuming more foods high in energy, fats, free sugars and salt/sodium, and many people do not eat enough fruit, vegetables and other dietary fibre such as whole grains.”<sup>12</sup>

---

While the current food system is failing to feed everybody, it is also making a substantial part of the world population sick, with around 1.9 billion adults and 340 million children worldwide classified as either overweight or obese.

In a nutshell, the WHO insists on two priorities, namely:

1. increasing intake of fruits and vegetables, while reducing fats;
2. drastically reducing sugar intake, especially processed sugar.

While there is no mention of an exclusively plant-based diet, the recommendations give numerous advice and tips on how to increase daily intake of dietary fibre. Those include: "Always including vegetables in meals and eating fresh fruit and raw vegetables as snacks, preferably those that are in season."<sup>13</sup> On the other hand, the keywords associated with fats and salt are "reducing", "limiting" and, when possible, "replacing." A closer look at our dietary patterns, particularly in the Global North, shows how far we still are from those recommendations.

In Germany, the most populous country in the European Union, the German Nutrition Society recommends limiting the consumption of meat to a maximum of 30 kilograms per person a year.<sup>14</sup> However, the Federal Ministry of Agriculture (BMEL) estimates that the real consumption of meat per inhabitants is almost double the maximum recommended consumption, at close to 60 kilograms a year.<sup>15</sup> Germany is not an exception. Meat consumption is either higher or comparable in industrialised countries like France, the United Kingdom and the United States.<sup>16</sup> Rebalancing our diets is one of the first steps to moving towards healthy diets, as these excesses come with numerous negative consequences, from harmful effects to our health to environmental degradation and destructive greenhouse gas emissions.

In the last few years, well-researched publications such as The EAT Lancet have moved a step further by directly encouraging semi-vegetarian ("flexitarian"), vegetarian

### The Planetary health diet is a good example of a flexible and healthy diet:<sup>18</sup>

"It is symbolically represented by half a plate of fruits and vegetables. The other half consists of mostly whole grains and plant proteins (beans, lentils, pulses, nuts), as well as unsaturated plant oils, modest amounts of meat and dairy, and some added sugars and starchy vegetables."

"The diet is quite flexible and allows for adaptation to dietary needs, personal preferences, and cultural traditions. Vegetarian and vegan diets are two healthy options within the planetary health diet but are presented as personal choices."



<https://eatforum.org/learn-and-discover/the-planetary-health-diet/>

and plant-based diets to both mitigate anthropogenic emissions and to lower the risk of non-communicable diseases. In its 2019 brief to policymakers, it estimated that adopting a planetary-health diet combined with targets for sustainable food production could prevent 11 million premature adult deaths a year.<sup>17</sup>

### The health cost

The excessive consumption of meat, salt, processed foods and sugar has an extremely high indirect economic cost. Essentially, it makes people sick. A recent article published by the Harvard Medical School estimates that unhealthy eating habits cost the American health System around 50 billion dollars



a year – just for cardiometabolic diseases. 84 per cent of the total cost consists of treating heart attacks and strokes (acute care), which shows the importance of promoting healthy eating habits as a preventive measure to avoiding higher future costs.<sup>19</sup>

The article mentions sugar-sweetened beverages and processed meats (typically, sausages, fried chicken, nuggets and other burgers almost exclusively sourced from industrial factory farms) as the two biggest contributors to these dramatic costs. But items that are absent from our diets also play a major role. Vegetables, fruits, and whole grains – in particular nuts – should be consumed in much greater quantities.

The SOFI report warns us that the world is currently off-track from achieving SDG2 (zero hunger) by 2030. It also estimated that, if current consumption patterns

---

**The ‘one size fits all diet’ of wealthy countries is neither efficient nor healthy and will not allow us to feed a growing world population within our planetary boundaries.**

continue, the “Diet-related health costs linked to mortality and non-communicable diseases are projected to exceed 1.3 trillion dollars per year by 2030.”<sup>20</sup> The report adds that the adoption of healthy diets could help reduce the direct and indirect costs by 97 per cent, proving how crucial the promotion of nutritious food can be, both in terms of human health and the economic costs.

Countries in the Global South are not yet consuming such unhealthy amounts of animal-based products and processed foods. However,

they are expected to see their health costs rise, due to the expected increase of global and regional fast-food chains and a growing demand by a rising middle-income class, inspired by the lifestyle and nutritional patterns from countries in the Global North. This will especially be true as shifts to more commoditised dietary patterns from the North, which include a very high percentage of processed meat and sugar, accelerate. In Ghana for example, obesity surged from 2 per cent in 1980 to close to 15 per cent in 2020.<sup>21</sup> With this in mind, national governments, international institutions and investors should further explore the potential of nutritious traditional diets that include a higher diversity of locally produced protein sources, such as pulses and seeds, rather than exporting unhealthy modern dietary patterns. The ‘one size fits all diet’ of wealthy countries is neither efficient nor healthy and will not allow us to feed a growing world population within our planetary boundaries.



## The environmental and climate cost

Resource-intensive and unhealthy food production and consumption also have a massive impact on our climate and environment. The FAO estimates that livestock accounts for around 14.5 per cent of global anthropogenic greenhouse gas emissions.<sup>22</sup> The hidden environmental cost of unhealthy diets is even higher than the health costs – the SOFI report estimates that “the diet-related social cost of greenhouse gas (GHG) emissions associated with current dietary patterns is projected to exceed USD 1,7 trillion per year by 2030”. Again, adopting healthy diets would dramatically reduce the bill, in this case by an estimated 41-to-74%.<sup>23</sup>

The 2019 International Panel on Climate Change (IPCC) Special Report on Climate Change and Land also encouraged “diversification in the food system” as it can reduce risks from climate change. It suggests that, *“Balanced diets, featuring plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health (high confidence).”*<sup>24</sup>

Once again, the benefits of switching from meat-centric eating to a plant-rich diet are numerous and would substantially help us to tackle the health, climate and environmental challenges that we collectively face.

In the same way that our current unhealthy dietary patterns are extremely costly for our health systems, they also generate even higher costs through the impact of negative externalities on our environment and climate. In a recent article, UNEP estimated that “industrialized farming – which

produces greenhouse gas emission, pollutes air and water, and destroys wildlife – costs the environment the equivalent of about US\$3 trillion every year. Externalized costs, such as the funds required to purify contaminated drinking water or to treat diseases related to poor nutrition, are also unaccounted for by the industry, meaning that communities and taxpayers may be picking up the tab without even realizing it.”<sup>25</sup>

## 3. The impact of COVID-19 on food security

### Income loss, disruption and prospects of building forward

Since COVID-19 started spreading throughout the world in 2020, the existing patterns of inequality have only gotten worse. While the recession in the Global North has been – to some extent – made manageable by the existence of safety nets and government programmes, the consequences in the Global South have been disastrous and have yet to be seriously measured or fully acknowledged.

The FAO recently warned us that we risk a “global food emergency” if we don’t take action. An additional 83-to-132 million people may go hungry as a consequence of the current global health crisis.<sup>26</sup>

Home office and social distancing are not an option for the vast majority of the world population. Farmers and food producers are facing the dilemma of putting their health at risk by interacting with others on fields and in markets or risking the loss of their entire income by staying at home. Similarly, lockdowns and curfews have had a disastrous impact on farmers who depend on regular transport to market their fresh produce. The same risks are faced on a daily basis by workers in the informal sectors, which represent a

significant part of the workforce in countries in the South.<sup>27</sup> Reduced food production and major disruptions in the already fragile supply chain will also make food more expensive and is expected to negatively impact nutrition worldwide. Given the disastrous implications of poor nutrition for the immune system, the most vulnerable populations are at an even higher risk of more acute COVID-19 infection. On the other hand, evidence is arising that people with their own vegetable garden are faring better off than those without in adapting to this new reality.<sup>28</sup>

Wealthier countries, on the other hand, have seen a more nuanced impact. The debate over factory farms, ultra-industrialised and processed foods (and its methods of productions) and the abuse of workers within the food industry has reached a more mainstream audience.<sup>29</sup> COVID outbreaks in numerous slaughterhouses and meat-processing factories have forced some governments to react and consider stricter regulations, for example the treatment and condition of foreign workers at meat processing facilities in Germany.<sup>30</sup>

The fear of contracting COVID-19 has also led many people to reconsider their diets in terms of the impact on their immune system. The first concrete measures to combat obesity, like the adoption of the ‘nutriscore’ in some European countries and attempts of mainstreaming plant-rich diets in canteens, have only been implemented recently. Similarly, larger supermarket chains and discounters have increased their fair trade and organically grown and produced food offers. The global conversation about the benefits of traditional, indigenous agricultural practices that are more resilient, sustainable and often more nutritious (e.g. diversifying crops depending on regions and soils) is also gaining traction. Recent data



from the FAO seem to confirm this trend, as the production and consumption of animal-based products seems to be stagnating or declining.<sup>31</sup> This year, per-capita meat consumption is set to fall to its lowest level in nine years, with last year's 3% decrease representing the biggest decline since at least 2000. The causes are numerous – economic crisis, lockdown, animal diseases, social distancing and rising awareness about healthy, sustainable diets – but early data suggests that the sales of plant-based alternatives, which had been constantly rising before the crisis, increased substantially during the COVID-19 lockdown.<sup>32</sup>

Market experts have predicted that the rise of plant-based products will continue to accelerate in the future. According to Deloitte, *“The surge in the market for plant-based alternatives is expected to continue across all geographies, with the North American meat substitutes market expected to grow by a larger percentage than Europe, with strong growth also anticipated in APAC and LAMEA regions, albeit from a smaller base than in Europe. The North American meat substitutes market is expected to grow to €1.8bn by 2025, an 80 percent increase from 2018. The APAC and LAMEA markets are forecast to grow strongly to a*

*market size of €1.5bn and €0.8bn respectively by 2025.”<sup>33</sup>*

The allocation of public funds to build forward and restart the economy will also play a major role in shifting towards more resilient production methods and healthier food choices. Governments and international financial institutions will need to support sustainable and healthier food products and production methods if they are serious about achieving both the SDGs and the Paris Agreement.

#### 4. How do we promote healthy diets?

##### What does it cost and who can afford it?

Today, adopting a healthy diet is not viable for the vast majority of the world population. The 2020 SOFI report tackles this issue of the cost and affordability of healthy diets in depth. ‘Cost’ is defined as what people have to pay to secure a specific diet, while ‘affordability’ relates to the cost of the diet relative to income. One of the key learnings here is that healthy diets are unaffordable and sometimes even inaccessible for a substantial proportion of the world population.

A healthy diet is estimated to cost an average of 60% more than one which only meets the requirements for essential nutrients.<sup>34</sup> As for the over 1.5 billion people worldwide who cannot even afford a diet that meets the levels of essential nutrients, their chances of accessing healthy foods within the current food-system are next to none. It is estimated that a healthy diet would cost 5 times as much as a diet that only meets dietary energy needs through the consumption of a starchy staple.

The question of availability is also relevant as ‘food deserts’ are a reality, even in rich countries. Urbanisation and changes in

### WORLD MEAT MARKET AT A GLANCE

	2018	2019 estim.	2020 f'cast	Change: 2020 over 2019
	<i>million tonnes (carcass weight equivalent)</i>			%
<b>WORLD BALANCE</b>				
<b>Production</b>	<b>342.2</b>	<b>338.9</b>	<b>333.0</b>	<b>-1.7</b>
Bovine meat	71.5	72.6	72.0	-0.8
Poultry meat	127.3	133.6	136.8	2.4
Pigmeat	120.9	109.8	101.0	-8.0
Ovine meat	15.8	16.0	16.2	0.9
<b>Trade</b>	<b>33.8</b>	<b>36.1</b>	<b>37.0</b>	<b>2.4</b>
Bovine meat	10.5	11.2	11.1	-1.0
Poultry meat	13.5	13.9	13.8	-0.3
Pigmeat	8.4	9.5	10.6	11.2
Ovine meat	1.0	1.0	1.0	-2.9
<b>SUPPLY AND DEMAND INDICATORS</b>				
<b>Per caput food consumption:</b>				
World (kg/year)	44.6	43.6	42.4	-2.8
Trade - share of prod. (%)	9.9	10.7	11.1	4.2
<b>FAO MEAT PRICE INDEX (2002-2004=100)</b>	<b>2018</b>	<b>2019</b>	<b>2020 Jan-May</b>	<b>Change: Jan-May 2020 over Jan-May 2019 %</b>
	166	176	174	4.5

working conditions and habits have contributed to the explosion of cheap, ultra-processed foods, which are often the only available foods in entire areas.<sup>35</sup> Although fruits and vegetables have seen an increase in availability worldwide over the past years, Asia is the only continent where there is sufficient supply to meet the recommended FAO/WHO daily recommendation of 400 grams a day.<sup>36</sup>

Fruits and vegetables are also sufficiently available and generally affordable in most upper-middle-income countries, but affordability is not automatically followed by a shift towards consumption patterns that constitute healthier diets. The report notes that while high-income countries do have the highest levels of affordability, they also have some of the highest obesity rates, showing that consumers do not always necessarily favour the healthier option just because it is available.

This all shows that shifting to healthy diets globally is not yet an easy option in the current context. Affordability is not enough; governments need to actively encourage the consumption of nutritious and healthy foods by implementing concrete policies and incentives. Requesting more transparency from producers on the health impact of junk food and restricting marketing drastically – as it has been done with tobacco – is crucial. This is also in the long-term budgetary interest of governments, as the externalities

and indirect costs of current diets are already massive and will increase further without immediate transformative action.

### **Accelerating the shift towards better diets by consistent policies and reallocating subsidies**

We urgently need to redirect public money – and agricultural policies in general – towards more nutrition-sensitive investment. Policy, at all levels, from sustainable procurement methods within institutions to subsidies, must be coherent to help establish healthy dietary patterns that are good for everyone. Nationally Determined Contributions (NDCs) have to include strong commitments to transform our food-systems toward sustainable consumption and production, including Food Loss and Waste and Planetary Health Diets, “[which] should become critical conditions for the countries’ and global food systems recovery and resilience,” as acknowledged in a recent report co-published by UNEP.<sup>37</sup>

This is particularly important in countries from the Global North, as the overconsumption of resource-intensive foods has direct negative effects on the South, including the destruction of livelihoods for animal feeds to the impact caused by climate change.

**Subsidies and the taxation are two tools that governments can use to move towards more sustainability,**

**health and resilience in food production. “Building forward” means that we have to stop financing harmful practices, such as industrial animal agriculture, with public money.** On the other hand, massive subsidies will be necessary to allow farmers to shift their production methods to more resilient practices and towards more climate-friendly food products. Increasing the tax rate on unhealthy and resource-intensive foods while lowering it for fruits, vegetables, legumes and other plant-based foods can help nudge consumers towards more nutritious and sustainable diets.

Governments also have to reject harmful and unfair practices and regulations that target more sustainable consumption habits and healthier eating patterns. The failed attempt to ban the commercial use of the descriptive term “veggie burger” in the European Union is an interesting case of special interests defending the status quo and trying to slow down the expansion of more climate-friendly products.<sup>38</sup> These proposed regulations also contradict many principles of the EU’s Farm to Fork Strategy and are not compatible with the climate strategy of reducing greenhouse gas emissions at the European level.

Education for children around food and nutrition must immediately become a mandatory element of school programmes to tackle excessive processed meat consumption and hidden sugars in processed foods. Considering the dramatic increase in childhood obesity and overweight adults, this is a very serious and urgent matter. Schools and caterers should also aim to always take sustainability and health factors into account when deciding what food is to be served. It has been frequently observed, across regions, that the amount of fruits and vegetables served to children is insufficient, while carbohydrates, sugar, meat or



**We urgently need to redirect public money – and agricultural policies in general – towards more nutrition-sensitive investment. Policy, at all levels, from sustainable procurement methods within institutions to subsidies, must be coherent to help establish healthy dietary patterns that are good for everyone.**



processed foods are an excessive part of lunch, therefore favouring the establishment of unhealthy dietary patterns.

Tackling food waste is also an urgent matter, as more than 30% of the food produced worldwide is eventually lost or wasted.<sup>39</sup> This is neither economically viable nor morally acceptable, particularly given the number of people who are undernourished. Governments can take action; the case of France's Food Waste bill authored by Guillaume Garot shows that strong actions with clear incentives can work for the benefit of all.

### France's Food Waste bill

While the world is aiming to achieve a 50% reduction in food waste by 2030 (SDG2), in 2016, France became the first country to pass a national regulation specifically targeting food waste.

The French law does not ban food waste at all retail levels but mandates big supermarkets (above 4.500 square feet) to sign an agreement with food assistance organisations to donate edible excesses.

While not a direct donation mandate or total food waste ban, the legislation received support from most stakeholders and proved effective. One year after its implementation, food assistance organizations observed a 30% increase in donations, while the percentage of supermarkets donating rose from 66% to 90% between 2016 and 2018.<sup>40</sup>

Other areas that could accelerate the shift towards healthier and more sustainable diets include regulations around marketing and packaging, where evident solutions already exist. Limiting or banning commercials by the private-sector for unhealthy processed foods and sodas, especially those aimed at young people, and providing clear, comprehensive information on the nutritional value of foods are two solutions that can be implemented

immediately. Generally speaking, governments should not be afraid of trying to nudge the habits of their citizens in a healthier direction, without impinging on their ability to make rational individual choices.

### Plant-based alternatives as part of the transition

As mentioned earlier, plant-based alternatives are gaining traction and increasingly becoming part of the everyday life of average citizens in countries with high meat consumption. While the market was estimated to be around 4.6 billion dollars globally in 2018, it is projected to reach 85 billion

dollars by 2030.<sup>41</sup> This presents massive opportunities for green entrepreneurs and businesses, and is already helping many people transition towards more plant-rich diets. This could be the trigger to lowering the impact of the negative externalities of our current resource-intensive food system. Let's keep in mind that we – and the generations that follow – will eventually have to pay for our actions.

The recently published article by Santo, et. al. "Considering Plant-Based Meat Substitutes and Cell-Based Meats: A Public Health and Food Systems Perspective" provides interesting insights on the potential impact of these products, by directly comparing those with the impact of farmed meat production.<sup>42</sup> When it comes to the impact on the environment and climate change, the verdict is clear: plant-based substitutes have a much lower impact, on average, than most farmed meat products. The authors remind us, for example, that, globally, half to three-quarters of agricultural land is used for livestock, which only accounts for 18% of calories and 25% of proteins in the global food supply.<sup>43</sup>

From a food-safety standpoint, farmed meat also presents numerous challenges and potential risks. Santos, et. al. note that "Many of the bacterial pathogens responsible for foodborne illness—such as Salmonella, Escherichia coli, Campylobacter, and Listeria—live in the guts of animals. Pathogens of animal origin can enter the food supply via multiple pathways, such as if manure is transported via runoff onto nearby produce fields or contaminates water sources used for irrigation." The slaughtering process can also present risks if animals' digestive tracks are accidentally severed, while the excessive use of antibiotics also brings additional hazards. The social impact is also to be considered – the authors mention that more than 25% of meat workers in indoor confinement suffer from respiratory illnesses, and that the recent intensification of food production did not benefit rural communities and economies.<sup>44</sup>

From a health perspective, it is worth noting that plant-based meat substitutes are being increasingly targeted at individuals with high meat consumption. These alternatives are mostly



acknowledged as a good source of protein, with improvements to be made for some of them from a nutrition standpoint, especially when it comes to the amount of salt and saturated fats.

Based on the limited evidence and data available about this new sector, it is clear that plant-based alternatives, as well as cell-based meat, will become an increasingly important part of food systems, especially in countries with an already high consumption of animal-based products. The diversity that exists across nations, cultures and regions does not allow for a one-

size-fits-all approach, especially when it comes to the potential impact of cellular agriculture. Numerous studies show that these alternative products generally have a much lower negative impact on the environment and climate than products from conventional animal agriculture. They are also a good source of protein, and, while not as healthy as pure, non-processed legumes (soybeans, lentils, beans, or peas) and vegetables, these products can help the average consumer to reduce their consumption of farmed meat and to slowly transition towards more sustainable and healthy diets.

---

Based on the limited evidence and data available about this new sector, it is clear that plant-based alternatives, as well as cell-based meat, will become an increasingly important part of food systems, especially in countries with an already high consumption of animal-based products.

Finally, it is important to note that the benefit of plant-based meat substitutes, from a public health and environmental perspective, will only be reaped if the demand offsets farmed-meat production, rather than simply adding to the combined production of farmed meats and its alternatives.

### Cell-based agriculture<sup>45</sup>

Cellular agriculture is the production of animal-based products from cell cultures rather than directly from animals.

The final products aim to resemble conventional meat, eggs, and dairy in terms of taste and structure while offering significant benefits for human health, the environment, and animal welfare.

A number of startups and companies are currently working on developing a variety of cultured foods, including beef, pork, chicken, fish, seafood, milk, and cheese.



What needs to happen in the next 10 years:

<b>GOVERNMENTS</b>	<b>FARMERS</b>	<b>PRIVATE SECTOR</b>	<b>CONSUMERS</b>
<p><b>Adjust tax rates</b> Lower taxation rate on fruits and vegetables, increase rate on processed foods and animal-based products.</p> <p><b>Redirect subsidies and Just Transition</b> Stop financing industrial animal agriculture, increase public funds for regenerative agriculture and plant-based proteins Farmers and food producers have to get paid fairly for the food they produce and urgently need massive public support to transition to sustainable production.</p> <p><b>Foster innovation</b> Adopt a legal framework favouring healthy plant-based innovations and progresses in cellular agriculture.</p> <p><b>Education</b> Make healthy and sustainable nutrition a mandatory part of school programs, raise awareness on impacts of unhealthy diets.</p> <p><b>Sanction food waste</b> Make excessive food waste history by creating donation mechanisms.</p>	<p><b>Accelerate transition to sustainable agriculture</b> Use future subsidies to increase the production of healthy crops, vegetables and fruits and adopting regenerative methods instead of using large-scale monocultures and industrial animal farming.</p> <p><b>Local and sustainable</b> Organize with consumers and local authorities to support local production and distribution at a fair price.</p>	<p><b>Invest in the future</b> Support a massive investment in healthy and sustainable food innovations, divest from industrial animal agriculture and reconnect brands with local and sustainable producers.</p> <p><b>Inform and label</b> Give clear and sufficient information on nutritional quality and climate / environmental footprint of each product through labelling.</p> <p><b>Use technology</b> Increase traceability and fight food waste through innovative solutions, e.g. apps and sharing/circular economy mechanisms; support food banks.</p> <p><b>Catering</b> Shift procurement towards healthier and more sustainable catering to increase plant-based offerings.</p> <p><b>Standards</b> Establish ambitious and binding business standards at all levels.</p>	<p><b>Accelerate the ongoing shift</b> Make plant-rich diets the norm and reduce the consumption of animal-sourced proteins to the amounts recommended by health experts.</p> <p><b>Awareness</b> Become aware of the health implications of unhealthy diets and foster intergenerational exchange of knowledge.</p>

# Conclusion

Broad transformative action is urgently needed to feed a growing, increasingly urban world population with nutritious food, tackle climate change and halt the destruction of our ecosystems. Massively reducing the production and consumption of resource-intensive animal products in the Global North will have evident co-benefits for health and environmental sustainability.

There is no path to achieving the Sustainable Development Goals and the Paris Agreement if we don't fundamentally change our current dietary patterns towards more plant-based protein sources. While an increasing number of consumers and businesses have paved the way for hope, it is now up to decision makers and national governments to take action. Integrating ambitious food NDCs, redirecting subsidies, taxing unhealthy foods, investing in education and supporting sustainable plant-based food innovations is not a guarantee of success, but a condition to avoid future disasters.

# Endnotes

- 1 <https://www.globalcause.co.uk/world-food-day/malnutrition-is-a-world-health-crisis-says-who-expert/#>
- 2 <https://www.theguardian.com/environment/2019/jan/16/new-plant-focused-diet-would-transform-planets-future-say-scientists>
- 3 <https://news.un.org/en/story/2020/09/1071412>
- 4 The State of Food Security and Nutrition in the World, (FAO, IFAD, UNICEF, WFP, WHO 2020)  
<https://www.wfp.org/publications/state-food-security-and-nutrition-world-sofi-report-2020>
- 5 WHO, 2016, <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
- 6 <https://news.un.org/en/story/2020/09/1071412>
- 7 UN Environment, 2020, <https://www.unenvironment.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and>
- 8 UN Environment, 2020, <https://www.unenvironment.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and>
- 9 ProVeg International, 2020, [https://proveg.com/wp-content/uploads/2020/07/PV\\_Food\\_and\\_Pandemics\\_Report\\_Digital.pdf](https://proveg.com/wp-content/uploads/2020/07/PV_Food_and_Pandemics_Report_Digital.pdf)
- 10 WHO, 2020, <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
- 11 WHO: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
- 12 WHO, <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
- 13 WHO, <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
- 14 DGE, <https://www.dge.de/presse/pm/weniger-fleisch-auf-dem-teller-schont-das-klima/>
- 15 <https://www.bmel-statistik.de/ernaehrung-fischerei/versorgungsbilanzen/fleisch/>
- 16 BBC, <https://www.bbc.com/news/health-47057341>
- 17 Eat lancet, [https://eatforum.org/content/uploads/2019/01/EAT\\_brief\\_policymakers.pdf](https://eatforum.org/content/uploads/2019/01/EAT_brief_policymakers.pdf)
- 18 Eatforum.org, <https://eatforum.org/learn-and-discover/the-planetary-health-diet/>
- 19 The high cost of a poor diet, Harvard Health Publishing,  
<https://www.health.harvard.edu/heart-health/the-high-cost-of-a-poor-diet>
- 20 The State of Food Security and Nutrition in the World, (FAO, IFAD, UNICEF, WFP, WHO 2020)  
<https://www.wfp.org/publications/state-food-security-and-nutrition-world-sofi-report-2020>
- 21 New York Times, [https://www.nytimes.com/2017/10/02/health/ghana-kfc-obesity.html?\\_r=0&utm\\_content=buffer36267&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](https://www.nytimes.com/2017/10/02/health/ghana-kfc-obesity.html?_r=0&utm_content=buffer36267&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer)
- 22 FAO, <http://www.fao.org/news/story/en/item/197623/icode/>
- 23 FAO, IFAD, UNICEF, WFP, WHO, "The State of food security and nutrition in the World, 2020", <http://www.fao.org/3/ca9692en/online/ca9692en.html#>
- 24 IPCC, Special Report on Climate Change and Land, <https://www.ipcc.ch/srccl/>
- 25 UN Environment, <https://www.unenvironment.org/news-and-stories/story/10-things-you-should-know-about-industrial-farming>
- 26 <http://www.fao.org/2019-ncov/q-and-a/impact-on-food-and-agriculture/en/>
- 27 World Bank, Beaten or Broken, Informality and Covid-19, <https://openknowledge.worldbank.org/handle/10986/34517>
- 28 <https://foodtank.com/news/2020/08/home-gardening-promotes-mental-health-during-covid-19/>
- 29 <https://www.bbc.com/news/world-europe-53177628>
- 30 BMAS, <https://www.bmas.de/DE/Presse/Pressemitteilungen/2020/bundeskabinett-verabschiedet-arbeitsschutzkontrollgesetz.html>



- 31 FAO, Food Outlook 2020, p. 6-7 <http://www.fao.org/3/ca9509en/CA9509EN.pdf>
- 32 FAO, <http://www.fao.org/3/ca9509en/CA9509EN.pdf>
- 33 Deloitte, Plant based alternatives, 2019 <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/consumer-business/deloitte-uk-plant-based-alternatives.pdf>
- 34 The State of Food Security and Nutrition in the World, (FAO, IFAD, UNICEF, WFP, WHO 2020) <https://www.wfp.org/publications/state-food-security-and-nutrition-world-sofi-report-2020>
- 35 [https://www.ers.usda.gov/webdocs/publications/45014/30940\\_err140.pdf](https://www.ers.usda.gov/webdocs/publications/45014/30940_err140.pdf)
- 36 The State of Food Security and Nutrition in the World, (FAO, IFAD, UNICEF, WFP, WHO 2020) <https://www.wfp.org/publications/state-food-security-and-nutrition-world-sofi-report-2020>
- 37 Enhancing NDCs for food systems, recommendations for decision makers; <https://wedocs.unep.org/bitstream/handle/20.500.11822/33598/ndcfS.pdf?sequence=1&isAllowed=y>
- 38 <https://www.theguardian.com/food/2019/apr/04/eu-to-ban-non-meat-product-labels-veggie-burgers-and-vegan-steaks>
- 39 UNEP, <https://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/sustainable-lifestyles/food-and-food-waste>
- 40 <https://foodtank.com/news/2019/06/opinion-frances-ban-on-food-waste-three-years-later/>
- 41 <https://markets.businessinsider.com/news/stocks/beyond-meat-ubs-plant-based-meat-market-85-billion-2030-2019-7-1028367962#>
- 42 <https://www.frontiersin.org/articles/10.3389/fsufs.2020.00134/full>
- 43 <https://www.frontiersin.org/articles/10.3389/fsufs.2020.00134/full>
- 44 <https://www.frontiersin.org/articles/10.3389/fsufs.2020.00134/full>
- 45 ProVeg International, <https://proveg.com/blog/what-is-cellular-agriculture/>
- 46 FAO, <http://www.fao.org/3/ca9509en/CA9509EN.pdf> McQuistan, C., Trogrlić, R. Š., Acharya, S. & Irfanullah, H. M. Eco-solutions: How to build a case for their scaling up? Flood Resilience Portal <https://floodresilience.net/blogs/eco-solutions-how-to-build-a-case-for-their-scaling-up> (2020).

**Author:**

**Raphael, Podselver,**  
**Proveg International, International Policy and Public Affairs Specialist**

Raphaël Podselver works as International Policy and Public Affairs specialist at the food awareness organization ProVeg International in Berlin. He graduated from Sciences Po Paris with a focus on European Affairs and has experience in political advocacy in Brussels as well as in business development for tech start-ups in Germany. In his work, he focuses on the impact of animal agriculture on climate-change and the environment and advocates for a shift towards less resource intensive and more plant-based food systems.

[raphael.podselver@proveg.com](mailto:raphael.podselver@proveg.com)  
<https://proveg.com/>