Action on food security

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Combatting malnutrition in all its forms – overweight and obesity as well as undernutrition and micronutrient deficiencies – is a global problem.

The European Academies Science Advisory Council (EASAC) recently published a report calling for urgent action on food and nutrition security: this action will need to include consideration of the options for changing European diets to mitigate climate change, conferring co-benefits for health.

EASAC brings together EU member states' national science academies with the aim of offering evidence-based advice to European policy makers. EASAC provides a means for the collective voice of European science to be heard and its recent report is part of a global project led by the InterAcademy Partnership (IAP). The analysis and recommendations for Europe are accompanied by parallel activities focusing on Africa, Asia and the Americas. The IAP report will be published later in 2018.

In the EASAC report, based on the work of a group of experts nominated by EASAC member academies, we emphasise that research and innovation are central to finding solutions. We recommend being more ambitious in identifying and using scientific opportunities: how can the current evidence base shape understanding of both supply- and demand-side challenges? And how should the research agenda be defined, including basic research, to fill knowledge gaps?

Climate change will have negative impacts on food systems, necessitating the introduction of climate-smart agriculture such as the adoption of plant breeding innovations to cope with drought. Agriculture and current diets also contribute significantly to climate change. Mitigating this contribution depends on land-sparing and agronomic management practices together with efforts to influence consumer behaviours associated with excessive greenhouse gas emissions from agriculture, including the over-consumption of calories and meat.

Among the core findings in our report are: *Food consumption will need to change to improve consumer health.* It is important to explore individual responsiveness to nutrition and the links to health, and to consider the particular needs of vulnerable groups. As part of the changes to food consumption patterns, a decrease in the consumption of animal protein could be important for both health and the environment but, globally, more research is needed to clarify these relationships and to measure sustainability related to consumption of healthy diets. We also call for policy makers to introduce incentives for affordable nutrition.

Meanwhile, there are new opportunities emerging from technological advances in analytical tests, to tackle sources of food contamination and assure food origin and quality. And lastly, European countries must collect more robust data on the extent of waste in food systems and interventions to reduce waste, as part of achieving Circular Economy and Bioeconomy objectives.

Agriculture has significant impacts on the environment: We call for the revamp of the Common Agricultural Policy to focus on innovation rather than subsidies, in order to play a key role in European competitiveness and the bioeconomy. Europe is dependent on food and feed imports. This dependence leaves us vulnerable to market fluctuations. It also increases Europe's footprint in many developing countries that will be most affected by climate change and environmental degradation.

Alternatives to traditional forms of animal protein include food from the oceans, laboratory-grown meat and insects. Research is needed to understand and inform consumer attitudes to innovative food and diets.

Also, research objectives for the next generation of biofuels should include examining the potential of cellulosic raw materials. Further ahead, energy research must continue to explore how to engineer systems with improved photosynthesis.

Finally, more effort is warranted to understand the function of soils in carbon sequestration and for the bioeconomy, for example, the soil microbiome as a source of novel antibiotics.

Europe should not stall on opportunities for innovation coming within range: Breakthroughs in genome editing and other genetic research are crucial to the future of agriculture. European policy makers must capitalise on these scientific advances. For improved plant and animal breeding, it is important to protect and characterise wild gene pools and to continue sequencing and functional assessment to unveil the potential of genetic resources. Precision agriculture offers many opportunities to improve productivity with reduced environmental impact. Large data sets are vital to support innovation and prepare for risk and uncertainty.

Underpinning all our recommendations is the recognition that research and innovation must be better integrated, across disciplines and the public and private sectors, in order to understand better the interfaces between health, nutrition, food and other ecosystem services. EASAC emphasises that efforts to increase food systems' efficiency should not focus on increasing agricultural productivity by ignoring environmental costs.

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