

Editorial: food and nutrition: pathways to a sustainable future

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Editorial: Food and Nutrition: Pathways to a Sustainable Future

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Abstract:	The world is waking up to the reality of climate change and the challenge of feeding 10 billion people in a healthy and sustainable way. For population and planetary health, food systems need to change. 'Food and Nutrition: Pathways to a Sustainable Future' was the first face-to- face Nutrition Society Summer Conference since 2018, bringing together leading contributors from across the globe to explore six pathways to a better tomorrow. Review papers from the conference symposia cut across disciplinary divides showcasing advances in scientific methods and our cumulative understanding of the impact of the food system on climate change. The depth, breadth and advancement of research presented demonstrates the power of collaborative research that can shape industry, individual and population recommendations and create a powerful shift towards the sustainable dietary patterns and systems that are so urgently required.

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Editorial: Food and Nutrition: Pathways to a Sustainable Future

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None.

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JP and LN jointly planned, wrote and edited the manuscript.

1 Abstract

2 The world is waking up to the reality of climate change and the challenge of feeding 10 billion 3 people in a healthy and sustainable way. For population and planetary health, food systems need to change. 'Food and Nutrition: Pathways to a Sustainable Future' was the first face-4 5 to-face Nutrition Society Summer Conference since 2018, bringing together leading 6 contributors from across the globe to explore six pathways to a better tomorrow. Review 7 papers from the conference symposia cut across disciplinary divides showcasing advances 8 in scientific methods and our cumulative understanding of the impact of the food system on 9 climate change. The depth, breadth and advancement of research presented demonstrates 10 the power of collaborative research that can shape industry, individual and population 11 recommendations and create a powerful shift towards the sustainable dietary patterns and 12 systems that are so urgently required.

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Key terms: sustainability, food systems, nutritional inequalities, planetary health,

15 personalised nutrition

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17 A sustainable food future

The 2019 EAT-Lancet report presented a stark warning: "Food is the single strongest lever to optimize human health and environmental sustainability on Earth. However, food provision is currently threatening both people and planet."⁽¹⁾. It was timely therefore, that the Nutrition Society Summer Conference 2022: *Food and Nutrition: Pathways to a Sustainable Future'* aimed to propose innovative solutions to achieve an urgent and significant shift towards a more sustainable food and nutrition future.

24

25 The conference took place in Sheffield and was jointly hosted by Sheffield Hallam University, The University of Sheffield and Sheffield City Council between the 12-15th July 2022. This 26 was the first in-person Nutrition Society Summer Conference since 2018, before FENS 2019, 27 28 and the first to be hosted in Sheffield for 21 years. The conference welcomed 252 delegates 29 from around the world, representing 13 countries: Australia, Canada, Chile, Ireland, Japan, 30 Korea, New Zealand, Nigeria, Singapore, Spain, United Arab Emirates, UK, USA, and 31 brought together global experts across a range of disciplines to share contemporary 32 research to advance our understanding of this important issue. The conference was organised into six themes: 'Building ethical food systems', 'Eroding nutritional inequalities', 33 'Enabling activity: lessons from exercise science', 'Sustaining an ageing population', 34 35 'Understanding mechanisms for health' and 'Navigating dietary trends'.

36

37 The opening plenary was eloquently delivered by Professor Sir Charles Godfray and chaired 38 by Nutrition Society CEO Mark Hollingsworth. Sir Godfray described the challenges of 39 providing healthy, sustainable and equitable diets for all, in the context of climate change and 40 a growing population. Despite declining fertility rates, the global population is expanding and 41 is set to peak at 10.4 billion by 2100, due to increased longevity resulting in an ageing 42 population. The food system alone has the potential to dangerously heat the world, even if 43 every other industry is on target to meet the proposed climate change milestones. It 44 contributes 30% of global greenhouse gas emissions, occupies 40% of available land an 45 accounts for 70% of freshwater withdrawal, alongside having other environmentally 46 detrimental impacts⁽²⁾. "We don't have the luxury of doing nothing", Sir Godfray reiterated, 47 "we need to sustainably intensify our food production". He concluded that the combined 48 effort of the food system needs to include modifying diets, sustainably increasing food production, reducing waste and improving food governance: powerfully stating "if we fail on 49 50 food, we fail on everything". 51

52 The core scientific programme on day one began with Theme Highlights from *Nutrition in the* 53 *Treatment, Management and Prevention of Disease* from Dr Athanasios Koutsos (University

54 of Glasgow) who shared insights from the RISSCI Study highlighting the individual nature of

- 55 the serum cholesterol response when replacing dietary saturated fat with unsaturated fat.
- 56 From *Nutrition and Optimum Lifecourse* Kiu Sum (University of Westminster) characterised
- 57 dietary challenges doctors face in the workplace, including creating the time, opportunity and
- 58 culture to eat appropriately. Madeleine Thomas (University of Leeds) shared data supporting
- the positive impact supermarket voucher schemes can have in increasing intake of fruit and
- vegetables in the *Food Systems* theme. Within the *Novel Nutrition Research Methodologies*
- 61 and Technologies theme, Tilly Potter (Rowett Institute, University of Aberdeen) brought *n*-of-
- 1 studies to the fore explaining how this type of work can help us better understand and
- 63 interpret nutritional science accounting for individual contributory factors: microbiome,
- 64 genotype and key ecological factors.
- 65

66 International acclaim

- 67 Award winning research was recognised throughout the conference with Silver Medal
- 68 Winner Dr Sarah Berry (King's College London) asking 'how meaningful is the mean?'. An
- 69 entire industry has exploded to capture public enthusiasm for personalised nutrition but
- 70 Sarah cautioned that what you eat, who you are and how you eat need to jointly inform
- 71 personalised advice, which should still sit alongside population recommendations. Professor
- Amelia Lake's (Teesside University) Rank Prize Winning Lecture explored the foodscape,
- highlighting opportunities to improve population health via manipulation of food
- reinforcing the notion that eating is a simple act but a complex behaviour
- 75 necessitating multi-faceted solutions designed to influence food choice. This year's
- 76 postgraduate symposium celebrated excellent work by Megan Flint (Sheffield Hallam
- 77 University), Ezgi Ozen (University of Reading) and Lena Acolatse (Ulster University) on
- 78 plant-based food products, SFA intake and body composition and child food portion sizes
- respectively, demonstrating that the future of nutrition science is in very safe hands. Dr Sara
- 30 Jimenenz-Montilla (university of Granada) presented the British Journal of nutrition Paper of
- 81 the Year⁽³⁾, which showcased associations between intrauterine growth and inadequate
- postnatal nutrition and consequent neurodevelopmental outcomes in very-low-birth-weight
 infants.
- 84

85 Pathways to a sustainable food and nutrition future

- 86 Symposium 1 highlighted the complexity and challenge involved in 'Building ethical food 87 systems'. Professor Peter Jackson (University of Sheffield) emphasised the need to adopt a food systems approach which includes food security and sustainability, proffering that this is 88 89 as much a sociocultural challenge as a technical one. Professor Emma Boyland (University 90 of Liverpool) discussed the ethical issues associated with advertising to children in an ever-91 complex, multi-platform environment which focuses heavily on foods high in saturated fat, 92 salt and sugar (HFSS) and the role of the food system in protecting our future generations. 93 Dr Owen Fraser (President of AOAC Sub-Saharan African Section) described the complexity 94 and nuance required to accurately interpret and understand the macro- and micro-nutrient
- 95 composition of food in light of multiple available methodologies.
- 96
- 97 Symposium 2 'Eroding nutritional inequalities', focused on population groups who are 98 particularly vulnerable to nutritional inequalities: pregnant women (Dr Nicola Heslehurst, 99 Newcastle University); young infants and families during the Covid-pandemic (Dr Christian 100 Reynolds, City University); and users of food banks (Dr Rachel Loopstra, King's College 101 London and University of Liverpool). Despite research and activity that has been injected into 102 underserved communities such as these, food insecurity is prevalent and research needs to 103 be translated into action and policy to ensure a joined up, whole-systems approach and 104 prevent the cumulative inequalities.
- 105
- 106 In symposium 3, we heard from Dr Julia Zakrzewski-Fruer (University of Bedfordshire) who
- 107 emphasised the importance of considering the interrelationship between diet and physical
- 108 activity in paediatric settings with a focus on cardiometabolic risk reduction. Professor

Stensel (Loughborough University) outlined the myriad of internal and external factors driving
obesity, highlighting the role of physical activity on appetite control, summarising the
evidence on the effectiveness of pharmacological interventions for obesity, before concluding
with an overview of the role of physical activity in a sustainable future. Professor John Saxton
(University of Hull) showcased the potential of the role of physical activity in patients with
prostate cancer. Despite studies demonstrating that exercise interventions are feasible and
beneficial for aerobic exercise capacity, muscular strength, and quality of life, further studies

- are required to understand the benefit on clinical end points such as progression free
- 117 survival.118

119 Dr Liz Williams (University of Sheffield) opened symposium 4, 'Sustaining an ageing

- 120 population' with a deep dive into sustainable protein for healthy ageing highlighting the risks 121 of inadequate protein intakes in older age and discussing sustainable protein sources that
- 122 might meet the demands of our expanding ageing population. Dr Crystal Haskell-Ramsay
- 123 (Northumbria University) followed with a focus on sustaining cognitive function exploring data
- 124 on cruciferous vegetables, blueberries, tart cherry, avocado, nuts, and reiterating the
- 125 importance of dietary variety. Dr Aisling O'Halloran (Trinity College Dublin) then shifted the
- focus to specific micronutrients in older age reviewing what we can learn from the TILDA cohort.
- 128
- 129 Symposium 5 focused on 'Mechanisms for health' with Professor Ian Givens (University of
- 130 Reading) providing an overview and update of dairy products and their role in
- cardiometabolic disease with many debates still afloat in this field, particularly in relation to
- the difference between high and low-fat dairy sources and their impact on health. Professor
- Suzan Wopereis (The Netherlands Organization) provided a detailed overview of how
- phenotypic flexibility can be used to bridge the gap between current population health
- guidelines and personalised nutrition which was followed by a fascinating talk by Dr Shilpa
 Bhupathiraju (Harvard Medical School) who shared a detailed overview of the developing
- 137 field of precision nutrition including how biomarkers can advance our understanding of plant-
- based diets. Metabolomics offer detail beyond dietary assessment, but this costly technology
- 139 is not yet fit to replace more traditional methods.
- 140
- 141 In the second plenary lecture, Professor Kieran Tuohy (University of Leeds) discussed the
- 142 mechanisms of action for improving health via manipulation of the dietary microbiome.
- 143 Promising research was highlighted including the use of novel ingredients and techniques to
- optimise gut microbiota, and improve BMI, waist circumference and hepatic fat. Whilst there
- are encouraging data emerging from short term interventions, Professor Touhy reiterated the
- need for long-term interventions which study the dietary impact on the gut microbiome.
- 147
- 148 On the final day of the conference we heard of the challenges associated with 'Navigating 149 dietary trends' (symposium 6). Dr Carrie Ruxton (Nutrition Communications) opened by 150 unpacking the anatomy of a message: general, segmented, and individual, and the tensions 151 this can create for both practitioners and people. Dr Megan Blake (University of Sheffield) 152 showcased the 'superpowers' of surplus food use, taking us way beyond distribution alone 153 into social cooking, social eating, and more. "The benefits are more than nutritional" said 154 Professor Ciarán Forde (Wageningen University and Research) as he described the 155 complexity of ultra-processed foods, exploring why classification is complicating our 156 understanding, reiterating that reformulation is a fact of life in modern food systems and that 157 the right reformulate should be defended. "Processing", he said, "has an image problem": 158 we have forgotten the role it can play in enabling our food systems to be *more* sustainable. 159

160 Input from industry

- 161 Quorn Foods' contributions throughout the conference raised the profile of mycoprotein
- 162 research and, having enjoyed a delicious breakfast from the Quorn breakfast truck on day

- 163 two, delegates could hear more of the science on day three. The Quorn Foods Breakfast
- 164 Symposium was chaired by Barbara Bray MBE, with contributions from Dr Hannah Theobald 165 (Quorn Foods), who shared insights into the history and nutritional qualities of, and
- 166 production technologies associated with fungal proteins and Dr Emma Derbyshire, exploring
- the case for recognising fungal protein as a third protein food group. University of Exeter 167
- 168 Professors Ben Wall and Francis Stephens went on to showcase how mycoprotein research
- 169 is influencing sports nutrition from 'molecule to movement' and what collective effects
- 170 mycoprotein can have on glycaemia, insulinaemia and lipidaemia in the context of overall
- 171 cardiometabolic health.
- 172

173 **Beyond the science**

- 174 The scientific programme of the conference was accompanied by a varied social programme 175 which aimed to be inclusive and focus on moving more and the sustainability theme of the 176 conference. This programme of activities included guided walking and running routes around
- 177 Sheffield and yoga provided by local activity coordinators and Sheffield Hallam University. On the evening of Day 1 there was a Greener, Fairer, Healthier showcase of local Sheffield 178
- 179 organisations involved in sustainable food production where canapes were provided using
- 180
- food that would otherwise have been destined for landfill. A drinks reception kindly
- 181 sponsored by IFIS was held on the second evening, presenting a Sheffield 'Conference
- 182 Cocktail' enjoyed with music from a harpist. The much-anticipated conference dinner took place on Thursday evening in the grandiose Sheffield Cutlers' Hall which entailed eating, 183
- 184
- drinking, and dancing late into the night: a fitting way to celebrate the first face-to-face
- 185 conference that many had attended post-lockdown.
- 186

187 In summary

- 188 Bringing the conference to a lively conclusion our panel discussion: 'Sustainable diets in
- 189 turbulent times' was elegantly chaired by Dr Christian Reynolds. Our panellists, Barbara
- 190 Bray MBE, Kristin Bash (University of Sheffield) and Professor Peter Jackson (University of
- 191 Sheffield) pitched their respective takes on next steps for a sustainable food and nutrition
- 192 future. We heard about the need for us to adjust the lens, to take a full ecological perspective
- 193 on the multiplicity of challenges: from the complex political landscape to post-Brexit Britain,
- 194 from power asymmetry in food systems to food governance and regulation. There is not one 195 answer but by working with, and improving on, the science and evidence we have globally,
- 196 genuine change can happen, for everyone.
- 197
- 198 'Pathways to a sustainable future' celebrated genuine advances in nutritional science and 199 consistent and passionate acceptance of climate change as everyone's responsibility, and a 200 problem which is affecting us all. We know that "an immense challenge facing humanity is to 201 provide a growing world population with healthy diets from sustainable food systems"⁽¹⁾. To 202 that end, we heard how novel methodologies, technologies and innovation applied across 203 the whole food system were keys to a better future and how, to achieve anything, we need to 204 embrace the realities of working across all relevant disciplines. We explored sustainability in 205 its broadest sense: in order to live healthily for longer and in a way that does not further challenge our already overstretched planet. The review papers from this conference, we 206 207 hope, provide a compelling argument that the time for change is now.
- 208
- 209 Jenny Paxman, Sheffield Hallam University
- 210 Lucie Nield, Sheffield Hallam University
- 211
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