Incorporating sustainability into dietary guidelines: UK experience & [some!] global perspectives

NNR2022 diet & sustainability seminar
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Dr. Kerry Ann Brown
Assistant Professor LSHTM, UK
kerry.brown@lshtm.ac.uk
Outline

UK dietary guideline experience [2016-2018]
- Diet optimisation modelling & qualitative consumer research
- FBDG sustainability assessment – post hoc 2016 & recent work

Global perspectives
- ‘Unintended and / or global’ consequences of UK FBDG
- Using water sustainability metrics
- What if there is no ‘average’ diet? India diet pattern analysis
- FAO active & supportive of sustainable dietary advice

What are the NNR2022 marginal choices/key decisions?
- Defining the problem [criteria, conflicts, global responsibility]?
- Purpose of DG advice [controversy]?
- Definition of sustainability evolving, transdisciplinary, not perfect!
UK Current DG: Eatwell guide booklet. PHE, 2018

Guide + food group info. + 8 tips for eating well

Tip 2:
Eat lots of fruit & veg
UK DG approach: health-led

- Ad-hoc updates [different bodies over time: FSA, DH, PHE]
- Guide = average diet to meet DRV
- Plate segment size via diet optimisation modelling [Oxford]
- Qualitative consumer research [PHE/FSA]
- Post hoc sustainability assessment [Carbon Trust]

UK optimisation modelling: no sustainability?

- Dietary intake data, 2008-2011, N= 1491 [NDNS]
- Food composition data [McCance & Widowson CoFID]
- PHE derived composite foods database [challenging!]

Optimisation modelling to meet revised DRVs
- main constraint: minimal change to diet
- cho free variable [as long as > 50 % EI]

- Identify who meets revised DRVs
- Substitute products to meet revised DRVs:
  - ↓ salt, fat, sugar [associated w/ processed meat?]
  - ↑ fruit, veg., oily fish & fibre [associated w/ plant-based diet?]
UK optimisation modelling constraints: sustainability?

<table>
<thead>
<tr>
<th>NUTRIENTS</th>
<th>Dietary recommendation</th>
<th>Constraint</th>
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</thead>
<tbody>
<tr>
<td>Energy</td>
<td>2250 kcal (9414 MJ)</td>
<td>No increase</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>≥50% of food energy</td>
<td>≥50% of food energy</td>
</tr>
<tr>
<td>Free sugars</td>
<td>≤5% food energy</td>
<td>≤5% food energy</td>
</tr>
<tr>
<td>Fat</td>
<td>≤35% food energy</td>
<td>≤35% food energy</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>≤11% food energy</td>
<td>≤11% food energy</td>
</tr>
<tr>
<td>Protein</td>
<td>Approx. 15% food energy</td>
<td>≥14.5 &amp; ≤15.5% of energy</td>
</tr>
<tr>
<td>Salt</td>
<td>≤6g/2363 mg sodium</td>
<td>≤6g/2363 mg sodium</td>
</tr>
<tr>
<td>Fibre (AOAC)²</td>
<td>30g</td>
<td>≥30g</td>
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<table>
<thead>
<tr>
<th>FOODS</th>
<th>Dietary recommendation</th>
<th>Constraint</th>
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<tbody>
<tr>
<td>Fruits and vegetables³</td>
<td>At least 5 portions of a variety each day</td>
<td>≥5 portions a day</td>
</tr>
<tr>
<td>Fish</td>
<td>At least 2 portions a week, one of which should be oily</td>
<td>≥2 portions (2*140g) a week, one of which should be oily</td>
</tr>
<tr>
<td>Red and processed meat</td>
<td>High consumers should reduce their intake to the average of the population (70g)</td>
<td>≤70g/day</td>
</tr>
</tbody>
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PHE 2016
Qualitative consumer research: no sustainability?

- Interviews: phase 1 (N=152) & Phase 2 (N=80)
- Remove knife & fork, and Eatwell ‘plate’ name
- Drawn images [not photos] & rename Eatwell ‘guide’
- Supporting messages to guide choices [8 tips/food group info.]
- High fat, salt & sugar foods outside main image [eat less often]
- Energy reference
- FOP label to guide ↓ fat, salt & sugar food choices
- Water / hydration & limited fruit juice intake
- **Reorder segment name [beans, pulses, fish, meat]**
- **Explicit sustainability messaging x 2**
UK Eatwell Guide: sustainability content x 2

balance of healthier & more sustainable food

2 portions of sustainably sourced fish / wk (1 oily)
Post hoc UK sustainability assessment

Carbon Trust, 2016

- Eatwell Guide 2016 vs. average NDNS diet 2010
- Eatwell Guide = lower environmental impact [GHGe, land, water]

→ Unclear full methodology used: data & underlying assumptions?
Assessing sustainability of FBDG [UK & global]

Milner 2020 [LSHTM] - feasibility!
- ½ UK meat/dairy replaced by f & v + cereals ↓
  GHGe ~20 % & avoid >30,000 premature [CVD / cancer] deaths / yr [Scarborough, 2017]

- UK FBDG incompatible w/ climate, land use, water, N targets

Scheelbeek 2020a [LSHTM] - conflicts!
- UK FBDG related to health gains [ f & v: 10 % ↓ mortality] BUT... enviro. gains complex: GHGe ↓ + no change in [blue] water use w/ ↓ ↑ adherence?

Local food system: -ve / +ve gain for biodiversity?

Ferguson-Gow, UCL

Graphic removed as work currently under review
UK FBDG & social responsibility [local & global]?

- ↑ local & seasonal consumption = ↓ GDP / livelihoods elsewhere? *Fair trade equivalent for made using sustainable water practices?*

- ↓ imported foods = ↑ price & ↓ equitable access to foods? *Could non-UK grown foods become out of reach for all but wealthy?*
Sustainability issues specific to regions: India

- Population Growth
- Dietary change
- Groundwater depletion
- Climate change
Water sustainability metrics: consider blue & green

- Water footprint = volume $H_2O$ to produce a food item
- Rainfall [green, most of food production]
  - Animal sourced foods, ↑ water from growing animal feed
  - Climate change disrupting rainfall patterns
- Irrigation [blue, higher risk of harm?]
  - Fruits & nuts ↑ water footprint
  - Competes w/ domestic use & aquifers running dry

- Sustainability of water source [where/when] crucial not just vol.

- Data resource: [Water Footprint Networks website](https://www.waterfootprint.org)
- Transparent sub-national trade/supply chain data unavailable
- Future food label for water footprints?

Harris 2019
No average diet: dietary pattern analysis?

Perez-Rodrigo 2016
Environmental impacts of Indian dietary patterns

Greenhouse gas emissions

Blue water footprints

- Rice & Low Energy
- Rice & Fruit
- Wheat & Pulses
- Wheat, Rice & Oils
- Rice & Meat

Green 2018
FAO & WHO led the development of FBDG around the world

Recent series of webinars

Diet optimisation modelling session some interesting queries:
- Food choice implications of models? Acceptability is important.
- Devise worse/best case scenarios to identify problem nutrients?

FAO diet modelling software SOLVER
- Country specific food intake patterns x energy levels
- Proportions of food groups in food graphic & quantity advice

Consultation on adding sustainability to definition of food security

FAO food-based dietary guideline webinars
Sustainable FBDG – controversy?

WHO pulls support from initiative promoting global move to plant based foods

*BMJ* 2019 ; 365  doi: https://doi.org/10.1136/bmj.l1700 (Published 09 April 2019)

Cite this as: *BMJ* 2019;365:l1700

New U.S. dietary guideline recommendations take aim at sugar for children and adults

Anxiety-baking may be at a new high during the pandemic, but the 2020 Dietary Guidelines Advisory Committee sours on added sugar.

‘...Agriculture Department has a history of watering down or disregarding committee recommendations in the final guidelines, often because of political pressures.’
Advice if UK were to revise FBDG now

- Characterising problem & purpose of FBDG guides all decisions
  - What do we expect FBDG to achieve?

- Transparent record of data, interpretation & difficult decisions
  - Model parameters
  - Limitations of model
  - Defined trajectory for model / uncertainty estimates
  - Open consultations

- Opportunity to integrate social & natural sciences
  - Work through acceptability/feasibility of dietary patterns
  - Model dietary pattern impacts
  - Calculate risks of combined metrics [health & sustainability]

Brown 2011 Brown 2020
Cautionary advice w/ sustainability metrics

- Variability over time & region
  - Different health & sustainability issues in global food systems
  - What is the impact of Nordic diets on other regions in the world?
- Consider both blue & green water footprints
- Research around the corner?
  - Optimisation with a variety of diets [Scarborough + Green?]
  - Wider system constraints [global impacts]
  - Incorporation of biodiversity [challenging, non-cumulative]
  - Methods to display marginal options / trade-off decisions
  - Improved definitions of [local/global] sustainability
- ↑ transparency of food supply chain
- Standardise enviro. metrics: HESITA db [Poore, Oxford]
Thanks to the following for their time in compiling these slides
- all errors or controversial opinions are mine alone!

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Francesca Harris, LSHTM
Dr. Pauline Scheelbeek, LSHTM

Dr. Peter Scarborough, Oxford

Prof. Louis Levy
formerly Head of Nutrition Science at PHE