The EAT Lancet Commission: Achieving Planetary Health Diets for 10 Billion People By 2050

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EAT-*Lancet* Commission approach

**Define a healthy reference diet** using the best available evidence (controlled feeding studies, long-term cohort studies, randomized trials).

**Define planetary boundaries** for 6 key environmental systems and processes (GHG, cropland use, water use, nitrogen and phosphorus application, extinction rate).

**Apply a global food systems modeling framework** to analyze what combinations of readily implementable measures are needed to stay within food production boundaries while still delivering healthy diets by 2050.

**Outline Strategies** to achieve the changes needed to meet the goal of healthy diets from sustainable food systems for all by 2050.
Target 1: Developing the Healthy Reference Diet Target

Based on this assumption, the following recommendations were made:

### Top 10 Risk Factors for Death, Globally, in 2017

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary risks</td>
<td></td>
</tr>
<tr>
<td>High blood pressure</td>
<td></td>
</tr>
<tr>
<td>Tobacco</td>
<td></td>
</tr>
<tr>
<td>High blood sugar</td>
<td></td>
</tr>
<tr>
<td>Air pollution</td>
<td></td>
</tr>
<tr>
<td>High body mass index</td>
<td></td>
</tr>
<tr>
<td>High LDL cholesterol</td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td></td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
</tr>
<tr>
<td>Impaired kidney function</td>
<td></td>
</tr>
</tbody>
</table>

### Macronutrient Intake

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Grams per Day (Possible Range)</th>
<th>Caloric Intake kcal per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole grains - Rice, wheat, corn and other</td>
<td>232 (possible range)</td>
<td>811</td>
</tr>
<tr>
<td>Tubers or starchy vegetables - Potatoes and cassava</td>
<td>50 (0–100)</td>
<td>39</td>
</tr>
<tr>
<td>Vegetables - All vegetables</td>
<td>300 (200–600)</td>
<td>76</td>
</tr>
<tr>
<td>Fruits - All fruits</td>
<td>200 (100–300)</td>
<td>126</td>
</tr>
<tr>
<td>Dairy foods - Whole milk or equivalents</td>
<td>250 (0–500)</td>
<td>153</td>
</tr>
<tr>
<td>Protein sources - Beef, lamb and pork</td>
<td>14 (0–28)</td>
<td>30</td>
</tr>
<tr>
<td>Protein sources - Chicken and other poultry</td>
<td>29 (0–58)</td>
<td>62</td>
</tr>
<tr>
<td>Protein sources - Eggs</td>
<td>13 (0–25)</td>
<td>19</td>
</tr>
<tr>
<td>Protein sources - Fish</td>
<td>28 (0–100)</td>
<td>40</td>
</tr>
<tr>
<td>Protein sources - Legumes</td>
<td>75 (0–100)</td>
<td>284</td>
</tr>
<tr>
<td>Protein sources - Nuts</td>
<td>50 (0–75)</td>
<td>291</td>
</tr>
<tr>
<td>Added fats - Unsaturated oils</td>
<td>40 (20–80)</td>
<td>354</td>
</tr>
<tr>
<td>Added fats - Saturated oils</td>
<td>11.6 (0–11.8)</td>
<td>96</td>
</tr>
<tr>
<td>Added sugars - All sugars</td>
<td>31 (0–31)</td>
<td>120</td>
</tr>
</tbody>
</table>
Regional consumption patterns vs Healthy Reference Diet

- Red meat
- Starchy vegetables
- Eggs
- Poultry
- Dairy foods
- Fish
- Vegetables
- Fruit
- Legumes
- Whole grains
- Nuts

Legend:
- Global
- East Asia Pacific
- South Asia
- Sub-Saharan Africa
- Latin America & Caribbean
- Middle East & North Africa
- Europe & Central Asia
- North America
National intakes compared to the healthy reference diet
## Substantial health benefits

<table>
<thead>
<tr>
<th>Approach</th>
<th>Risk Estimate</th>
<th>Adult Deaths Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach 1</td>
<td>19%</td>
<td>11.1 million</td>
</tr>
<tr>
<td>Comparative Risk</td>
<td></td>
<td>adult deaths per year</td>
</tr>
<tr>
<td>Approach 2</td>
<td>22.4%</td>
<td>10.8 million</td>
</tr>
<tr>
<td>Global Burden of Disease</td>
<td></td>
<td>adult deaths per year</td>
</tr>
<tr>
<td>Approach 3</td>
<td>23.6%</td>
<td>11.6 million</td>
</tr>
<tr>
<td>Empirical Disease Risk</td>
<td></td>
<td>adult deaths per year</td>
</tr>
</tbody>
</table>
Target 2: Developing Sustainable Food Production Targets

Based on this assumption, Made these recommendations

- No new emissions from Agriculture
- 0 land expansion
- >30% flows in basins
- Pollution <1 – 2.5 mg N L⁻¹
- Pollution <50- 100 mg P m⁻³
- 50% land intact by ecoregion

### Earth system process

<table>
<thead>
<tr>
<th>Earth system process</th>
<th>Control variable</th>
<th>Boundary (Uncertainty range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change</td>
<td>GHG emissions</td>
<td>5 Gt CO₂-eq yr⁻¹ (4.7 – 5.4 Gt CO₂-eq yr⁻¹)</td>
</tr>
<tr>
<td>Land-system change</td>
<td>Cropland use</td>
<td>13 M km² (11–15 M km²)</td>
</tr>
<tr>
<td>Freshwater use</td>
<td>Water use</td>
<td>2,500 km² yr⁻¹ (1000–4000 km² yr⁻¹)</td>
</tr>
<tr>
<td>Nitrogen cycling</td>
<td>N application</td>
<td>90 Tg N yr⁻¹ (65–90 Tg N yr⁻¹) * (90–130 Tg N yr⁻¹)**</td>
</tr>
<tr>
<td>Phosphorus cycling</td>
<td>P application</td>
<td>8 Tg P yr⁻¹ (6–12 Tg P yr⁻¹) * (8–16 Tg P yr⁻¹)**</td>
</tr>
<tr>
<td>Biodiversity loss</td>
<td>Extinction rate</td>
<td>10 E/MSY (1–80 E/MSY)</td>
</tr>
</tbody>
</table>

**Global Implication**

- No new emissions from Agriculture
# Achieving planetary health diets

<table>
<thead>
<tr>
<th>Actions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary shift</td>
<td>Planetary health diet – as outlined in Table 1.</td>
</tr>
<tr>
<td>Halve waste</td>
<td>Food losses and waste reduced by half, in line with SDG target 12.3.</td>
</tr>
<tr>
<td>PROD</td>
<td>Closing yield gaps to about 75%; rebalancing N and P application; improving water management; implementation of agricultural mitigation options; and land is expanded first into secondary habitat and then to intact forests to minimize impacts on biodiversity.</td>
</tr>
<tr>
<td>PROD+</td>
<td>Closing yield gaps to 90%; a 30% increase in N use efficiency and 50% recycling rates of P; phase-out of first-generation biofuels; implementation of available bottom-up options for mitigating GHG emissions; and optimizing land-use across regions to minimize impacts on biodiversity.</td>
</tr>
</tbody>
</table>
Environmental effects of food

Modeling Out the Scenarios

GHG emissions

Cropland use

Bluewater use

Nitrogen application

Phosphorus application

Legend:
- Baseline
- Waste/2
- Waste/4
- Tech
- Tech+
- Guidelines
- Flexitarian
- Combination (medium)
- Combination (high)
- Boundary
What the EAT Lancet did do...

- Established some reasonable consensus among 37 very different experts.
- Set scientific targets that deal with both sustainable human health and planetary health.
- Sparked a scientific and political debate.
- Aspired more work in the space and organizations looked to developing their own strategies and responses.
- Got people thinking about their diets.
- Highlighted the notion that context is everything.
- Made some industries nervous.
What the EAT Lancet did NOT do…

• Did not provide specifics on how countries would take on these lofty global targets and transformation. It did not provide much in the way of the local context, social determinants and tradeoffs countries face.
• Set no time frame and no cost on how to accomplish the targets.
• Did not take on the entirety of food systems – only the two “ends” of the system.
• Did not tackle the inequities of accessing healthy diets within food system and their transitions – i.e. who is “being left behind.”
• Did not closely examine or consider actor behavior, especially consumers, and what drives their dietary choice (taste, price and convenience).
• Did not focus on who will feed us, their livelihoods, and the economic pay-off or consequences.
• Did not mention women’s empowerment or agency. Not once. Shame on me.
• Did not address confusion of sustainable diets and the epidemiology to support the claims.
• Did not adequately address the land constraints in taking on a flexitarian diet particularly if the world is to take on a “Half Earth” approach.
Are all animal source foods bad enough to restrict so much?
Changes in food production to deliver the planetary health diets. Possible?

Almost no increase in cereal production

- Vegetables: +75%
- Fruits: >50%
- Red meat: >65%
- Poultry: >50%
- Eggs: >50%
- Fish: >50%
- Dry beans, lentils, peas, soy: >75%
- Nuts: >150%
Thank you!

@jessfanzo
Diet space is complex...and so is disease burden

11 million deaths are attributable to dietary risk factors

69% packaged foods aren’t aligned with healthy diets

Trends in energy purchased from sugar-sweetened beverage categories, by country income level


All things are not equal in meat

Limiting ruminant meat consumption to 52 calories/person/day in all regions reduces the GHG mitigation gap by half and closes the land gap

Beef “consumption” (g/capita/day) measured in the food supply

Source: GlobAgri-WRI model, with source data from FAO (2017a); UNDESA (2017); FAO (2011b); and Alexandratos and Bruinsma (2012).
Disruptions across the entire food system

Food supply chains
- Production systems: Farmers, indigenous peoples, agribusiness, land and plantation owners, fisheries, financial entities
- Storage and distribution: Transporters, agribusiness, distributors
- Processing and packaging: Packing plants, food and beverage industry, small and medium enterprises
- Retail and markets: Retailers, vendors, food outlet owners, traders, restauranteurs, wholesalers

Food environments
- Food availability and physical access (proximity)
- Economic access (affordability)
- Promotion, advertising and information
- Food quality and safety

Consumer behaviour
- Choosing where and what food to acquire, prepare, cook, store and eat

Diets
- Quantity
- Quality
- Diversity
- Safety

Impacts
- Social
- Economic
- Environmental

Political, programme and institutional actions

Drivers
- Biophysical and environmental drivers: Natural resource capital, ecosystem services, climate change
- Innovation, technology and infrastructure drivers: Innovation, technology, infrastructure
- Political and economic drivers: Leadership, globalization and trade, conflicts and humanitarian crises, food prices and volatility, land tenure
- Socio-cultural drivers: Culture, religions & rituals, social traditions, women's empowerment
- Demographic drivers: Population growth, changing age distribution, urbanization, migration & forced displacement

HLPE 2017 Report Nutrition and Food Systems
Effects of climate change on value chains

- Heat and water stress
- Pests
- Diseases

- Pathogens, mycotoxins
- Cold storage needs

- Food prices

- Consumption
- Intestinal nutrient absorption

Production
- Yields
- Nutritional Value

Storage
- Food waste

Marketing and Retail
- Food availability

Consumption and Utilization
- Nutritional needs
Don’t forget about *who* will continue to feed the world

“Now we are transforming from farmers to urbanites. Our newest experiment-to feed massive numbers of people from the work of a few-is just beginning. The outcome is yet to be seen.”

– Ruth DeFries, *The Big Rachet*
Who plays a role? Individuals, industry or state?

• **Don’t leave it to the individual:** There is a lack of evidence for individuals taking action, and attitude-action gaps are evident. Public understanding of the environmental and nutritional impacts of food is low.

• **Don’t leave it to industry goodwill or enlightened self-interest:** Some in the food industry are acting but their efforts alone are not enough.

• **Governments need to govern:** Policy makers need to create a strong regulatory and fiscal framework, and international trade needs to reflect the importance of sustainable healthy diets.

• **CSOs** can cultivate movements, coalitions & networks among citizens and communities.
Price, quality, and taste are important to consumers

Factors influencing consumer product choice, percentage of UK shopper responses

Source: Ranganathan et al. Shifting Diets for a Sustainable Food Future, World Resources Institute, 2016.
Sustainable Alternatives & Reformulations
Consider the local context and its determinants and the trade-offs

We must address the underlying **social determinants** that impact our health and the planet. Every country is impacted by poverty but its determinants may be different, or the same...

- Racial disparities
- Incarceration & gun violence
- Drugs and alcohol abuse
- Food insecurity
- Obesity and diabetes

- Tribal disparities
- Social unrest & border conflict
- Herb abuse
- Food and water insecurity
- Stunting and wasting

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**An exceptionally murderous city**

**Crime and despair in Baltimore**

*As America gets safer, Maryland's biggest city does not*