Nutritional Benefits of Animal-Source Foods

The Importance of Transparent Evidence-Based Health Metrics

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&
Director Human Health, Devenish Nutrition
Sustainable Nutrition

invites us to consider
SUSTAINABLE FOOD SYSTEMS (food production) & SUSTAINABLE DIETS (food consumption), simultaneously as opposed to separately

One Health From Soil to Society

Sustainable food systems delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised.

Sustainable diets are diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. They are “protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.”
WHO Definition of Healthy Diet

A healthy diet helps to protect against;

**Malnutrition in all its forms,**
as well as

**Non-communicable diseases (NCDs),**
such as diabetes, heart disease, stroke and cancer.

**Current Double Health Burden of Malnutrition.**

- **1.9 billion are Overweight or Obese**
- **850 million are Chronically Undernourished**
- **2 billion suffer from Hidden Hunger**

**Animal-Source Foods**

**Top Sources of Commonly Lacking Nutrients**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Beef</th>
<th>Fish</th>
<th>Poultry</th>
<th>Eggs</th>
<th>Milk</th>
<th>Green leafy</th>
<th>Root</th>
<th>Whole grains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Fat</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Calcium</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Average National Diets Low in Animal-source Foods Do Not Meet Needs for Essential Micronutrients**

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*Nordhagen S, Beal T & Haddad L. The role of animal-source foods in healthy, sustainable, and equitable food systems. GAIN Discussion Paper 2020*

*Beal T & Ortenzi F. Priority micronutrient density in foods. Frontiers in Nutrition 2022*
Inverse Relationship between Childhood Stunting & Annual Meat, Milk & Seafood Consumption

UN Food and Agriculture Organization (FAO) 2017
Primary school test scores of children after 5 semesters of receiving animal sourced foods (meat or dairy) were significantly greater than those of the control groups (plant-based foods or no additional nutrition).

Hulett et al. Animal source foods have a positive impact on the primary school test scores of Kenyan schoolchildren in a cluster randomised, controlled feeding intervention trial. Brit J Nutrition 2014
Consumption of too little animal-source foods is also not optimal for longevity.
Climate Change Poses Potentially Catastrophic Threats to Human Health

- Endangerment of Global Food Supplies
- Droughts & Desertification
- Heat & Extreme Weather Events
- Vector-borne Diseases
- Increased Poverty, Inequalities, and Migration
The EAT-Lancet Commission Reference Diet Recommended;
- Doubling Intakes of Fruits, Vegetables, Legumes, Nuts & Seeds,
- Halving Meat & Dairy Intakes

BUT
- Predicted annual saving of 11 million NCD deaths
  - due to changed intakes of calories, salt, fruits, vegetables, whole grains & nuts,
  - not due to reduced red meat intake.
- Halving dairy would increase cancer and cardiovascular deaths
- Nutritional deficiencies caused by the halving of meat and dairy not considered
- Impact of ultra-processed nature of plant-based alternative foods not considered

Currently Available Plant-Based Meat & Dairy Alternatives are Ultra-Processed Foods, High in Added Sugars, Salt & Multiple Cosmetic Additives

- Same Protein Content as Steak but 5 times the Salt
- Jackfruit & Mushroom Products Typically Have Even More Sugar & Salt, Multiple Additives, & <20% of the Protein
- Unsweetened Almond Milk Twice the Salt 1/8 the Protein, & ¼ the Zinc

“The mimicking of animal foods using isolated plant proteins, fats, vitamins & minerals likely underestimates the true nutritional complexity of whole foods”

“Novel plant-based meat (and dairy) alternatives should arguably be treated as alternatives in terms of sensory experience, but not as true replacements in terms of nutrition”

Recent Publications Recommending Dramatic Reductions and/or Exclusion of Animal-Sourced Foods From the Human Diet

Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems

Small targeted dietary changes can yield substantial gains for human health and the environment

Global Burden of Disease (GBD) Data and Analyses are Quoted and Influence Policies of;

• Food and Agriculture Organization of the United Nations
• World Health Organization.
• European Commission - Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system.
• The National Food Strategy (England, but collaboration with Scotland, Wales & N. Ireland).

GBD studies are led by the Institute for Health Metrics and Evaluation, University of Washington, Seattle, who recently described the GBD studies as “THE DE-FACTO SOURCE FOR GLOBAL HEALTH ACCOUNTING”.
Dietary Risks and Deaths

**GBD 2017 Analysis Versus GBD 2019 Analysis**


Benefits of Milk/Dairy Underestimated in both GBD 2017 & 2019 Analyses
Milk & Dairy Consumption & Relationship with Colorectal Cancer

GBD 2019 Estimation of Milk Consumption

Majority of World’s Population Consume;
≤ 300g/day
≤ 1 helping/day

World Cancer Research Fund/
American Institute for Cancer Research.
Diet, Nutrition, Physical Activity & Cancer: a

Milk/Dairy Intake up to 850 g/day (∼3 helpings/day) Protects Against Colorectal Cancer
At Least 2 Full-Fat Dairy Servings/Day
32% Less Cardiovascular Events &
25% Less Mortality

<table>
<thead>
<tr>
<th>n</th>
<th>Events</th>
<th>HR (95% CI)</th>
<th>( P_{\text{trend}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total mortality</td>
<td></td>
<td></td>
<td>0.01</td>
</tr>
<tr>
<td>&lt;0.5 servings per day</td>
<td>12399</td>
<td>547 (4.4%)</td>
<td>1.00 (1.00-1.00)</td>
</tr>
<tr>
<td>0.5-1 servings per day</td>
<td>12023</td>
<td>374 (3.1%)</td>
<td>0.84 (0.74-0.98)</td>
</tr>
<tr>
<td>1-2 servings per day</td>
<td>8853</td>
<td>317 (3.6%)</td>
<td>0.89 (0.74-1.06)</td>
</tr>
<tr>
<td>&gt;2 servings per day</td>
<td>7552</td>
<td>248 (3.3%)</td>
<td>0.75 (0.60-0.92)</td>
</tr>
</tbody>
</table>

CVD Risk Lowest
with Highest Levels of
Serum Pentadecanoic Acid
(Biomarker of Dairy Fat Intake)


Dietary Risks and Deaths

GBD 2017 Analysis Versus GBD 2019 Analysis

Excesses

- High body-mass index / diets high in calories
- Diets high in sodium
- Diets high in trans fats
- Diets high in sugar-sweetened beverages
- Diets high in processed meats
- Diets high in red meat
- Child & maternal malnutrition
- Diets low in whole grains
- Diets low in fruits
- Diets low in nuts & seeds
- Diets low in vegetables
- Diets low in seafood omega-3 fatty acids
- Diets low in fibre
- Diets low in polyunsaturated fatty acids
- Diets low in legumes
- Low bone mineral density / vitamin D & calcium deficiencies
- Vitamin A deficiency
- Diets low in calcium
- Diets low in milk
- Iron deficiency
- Zinc deficiency

Deficiencies

- Diets high in red meat
- Diets high in processed meats
- Diets high in sugar-sweetened beverages
- Diets high in trans fats
- Diets high in sodium
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Dangers of Diets Low in Long-Chain Omega-3 PUFAs Further Underestimated in GBD 2019 Analysis

2019/2017 Ratio of deaths

- 1.1
- 0.6
- 2.5
- 1.8
- 2.3
- 35.8
- 0.9
- 0.6
- 0.4
- 0.3
- 0.4
- 0.2
- 0.7
- 0.1
- 1.3
- 2.1
- 0.8
- 1.3
- 0.7
- 0.1

Number of deaths (in thousands)
Consumption of Long-chain Omega-3-Polyunsaturated Fatty Acids (EPA & DHA) Associated with Improved Human Health

During Infancy & Childhood, Omega-3-PUFAs are Important for;
- Brain development & cognitive function
- Vision
- Muscle & joint health

In Later Life They Protect Against
- Alzheimer's disease
- Depression &
- Psychosis
- Heart attacks
- Strokes
- Cancer

Only 20% of world’s populations consume the recommended intake of EPA + DHA (≥ 250 mg/day)

Reasons for this world-wide deficiency
- Insufficient global wild fish stocks.
- Levels of omega-3-PUFAs in farmed salmon & trout have more than halved over the past 20 years.
- Many (particularly children) do not like oily fish.
Dietary Risks and Deaths

GBD 2017 Analysis Versus GBD 2019 Analysis

Christopher JL Murray & GBD 2017 Diet Collaborators. Lancet 2019


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1.3
0.1
0.8
1.3
0.7
0.1

Number of deaths (in thousands)

Deaths Attributed to Red Meat Consumption Increased 36-fold in GBD 2019 Analysis

0 1000 2000 3000 4000 5000

Excesses

Deficiencies

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2017
2019

2019/2017 Ratio of deaths

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0.4
2.1
1.3
0.1
0.8
1.3
0.7
0.1
Red Meat Consumption & All-Cause Mortality Risk Which is Correct?

Global Burden of Disease Study 2019
Lancet 2020

Prospective Urban Rural Epidemiology (PURE) Study
American Journal Clinical Nutrition 2021
Key Questions

• Where are the peer-reviewed publications of their updated or new systematic reviews, which;
  • Address the 27 item PRISMA Statement and the 20 item GATHER Statement checklists?
  • Provide the evidence for the changing of the red meat TMREL from 22.5g/day to 0g/day?

• Have the additional deaths and illnesses, from iron deficiency anaemia, elderly fragility, child and maternal malnutrition, that would result from imposition of a red meat TMREL of zero been included in the GBD 2019 estimates?
36-fold higher estimate of deaths attributable to red meat intake in GBD 2019: is this reliable? – Author's reply

Christopher J L Murray on behalf of the GBD Risk Factors Collaborators

Published: March 21, 2022
DOI: https://doi.org/10.1016/S0140-6736(22)00518-9

Admission of Errors

- “Clear protective relationship between red meat intake and haemorrhagic stroke”
- “No evidence supporting a relationship between red meat consumption & sub-arachnoid haemorrhage.”
- “The strength of evidence regarding the relationship between red meat and various outcomes - including ischaemic heart disease - is relatively weak.”
- “Setting of the red meat TMREL to zero in the GBD 2019 analysis is not correct.”
- “Estimates of attributable deaths for red meat will be reduced in all future GBD analyses.”

Immediate correction of all errors of fact is mandatory according to Lancet’s guidelines, Committee on Publication Ethics (COPE) & International Committee of Medical Journal Editors (ICMJE).

Key Questions Unanswered

- GBD Collaborators unable/unwilling to provide peer-reviewed published evidence to substantiate their new systematic reviews - Professor Murray has since confirmed that GBD 2019 is not PRISMA compliant.
- GBD Collaborators do not intend to include the totality of nutritional effects of red meat in their analyses
“We support Stanton and colleagues’ call for further clarification, justification, or reconsideration of the theoretical minimum risk exposure level of zero for unprocessed red meat selected by GBD in their latest estimates.”

“The increase in the estimated burden appears implausible, and the lack of transparency undermines the authority of the GBD estimates.”

“Neither WCRF nor other international organisations recommend complete avoidance of meat”

“The absence of an explicit rationale for the assumptions is troublesome, unsupported by the evidence, and unrealistic.”


Considerable Media & Scientific Interest

The Sunday Times
Valerie Flynn August 28th 2022

‘Serious errors’ in research linking deaths to red meat’

Scientists claim a study ignored nutritional benefits and have called on The Lancet to correct or retract the findings.

The World Cancer Research Fund and the Academy of Nutrition Sciences have expressed their support for RCSI, UCD and QUB scientists who uncovered the serious errors in the Global Burden of Disease (GBD) study.

Latest estimates of deaths from #redmeat by Global Burden Disease Study 36 times greater than 2017. Red meat may not kill at all, but something seriously wrong in estimate.

Calls for evidence remain unanswered even in latest author’s response – big problem.
Key Take Home Messages

- Animal-source foods (dairy, meat, fish and eggs) are nutrient rich foods.
- The relationship between red meat and disease burden is mirror J-shaped.
  - When eaten as part of a balanced diet, red meat provides considerable protection against nutritional deficiencies.
  - Low certainty evidence that relatively small deleterious effects possibly occur with consumption in excess of 500g weekly.
- The majority of the world’s population are not eating enough dairy nor omega-3-PUFA rich foods.
- Replacing animal sourced foods with plant-based ultra-processed foods, so as solve greenhouse gas emissions, is very likely to harm human health - women, children, the elderly and those of low income will be particularly adversely impacted.
- Policy-makers should be extremely wary of global health estimates that;
  - Are not rigorously and transparently evidence-based.
  - Ignore the protections against nutritional deficiencies afforded by animal-source foods.