How Much Red Meat Should We Eat?

Will the WWF Climate Ambitions Endanger Human Health?

Alice V. Stanton

Professor, RCSI University of Medicine & Health Sciences

&

Director Human Health, Devenish Nutrition

RCSI UNIVERSITY OF MEDICINE AND HEALTH SCIENCES

DEVENISH™ Beyond Nutrition

Worshipful Company of Butchers

City Meat Lecture

November 24th 2022

Disclosures

Non-remunerated member of;
ÅThe Irish 2030 Agri-Food Strategy Committee,
ÅHorizon Europe's Cancer Mission Assembly,
ÅThe Irish Climate and Health Coalition,
ÅThe Council on High Blood Pressure of the Irish Heart Foundation,
ÅThe World Action against Salt, Sugar, and Health (WASSH).

Part-time employee and owner of stock of Devenish Nutrition.

Omnivore.

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~~ Triple Health Burden of Malnutrition.

1.9 billion are
Overweight or **Obese**

850 million are
Chronically Undernourished

2 billion suffer from
Hidden Hunger

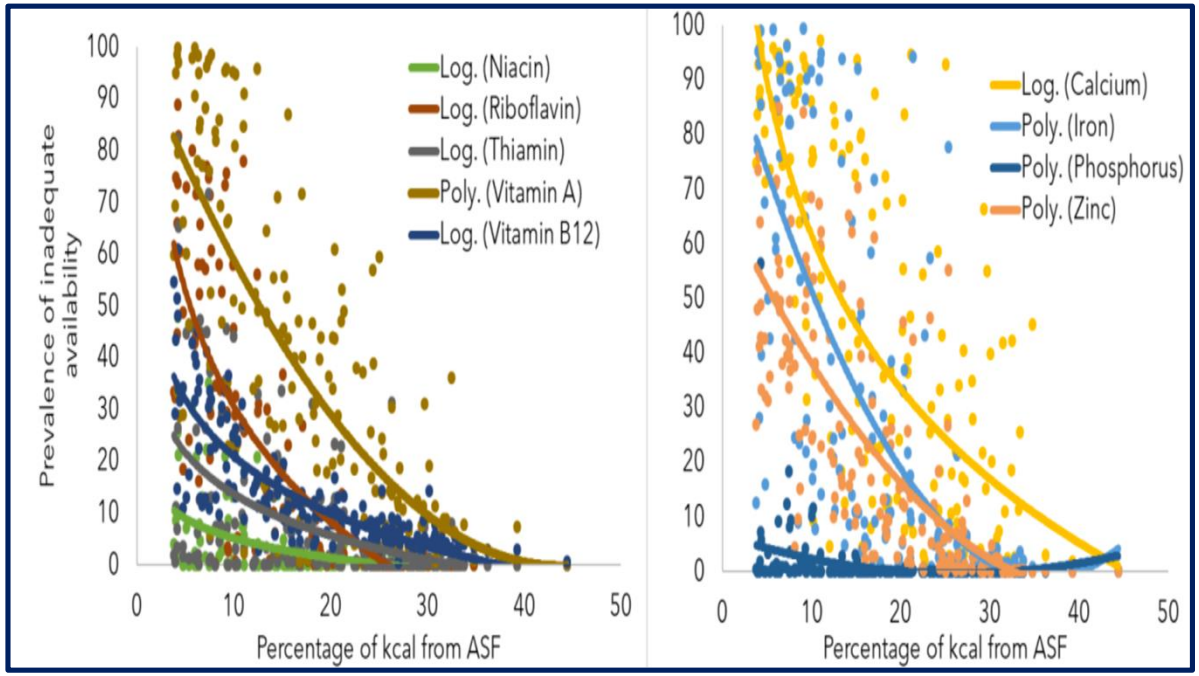
Sources: FAO, 2015 | WHO, 2017 | WHO, 2012

Animal-Source Foods Top Sources of Commonly Lacking Nutrients

	2+ nutrients	Iron	Zinc	Vitamin A	Calcium	Folate	Vitamin B_{12}
Liver	Very high	Very high	Very high	Very high	Low	Very high	Very high
Spleen	Very high	Very high	Very high	Low	Low	Low	Very high
Small dried fish	Very high	Very high	Very high	Very high	Very high	Low	Very high
Dark leafy greens	Very high	High	Low	Very high	Very high	Very high	Low
Bivalves	Very high	Very high	Very high	Very high	Very high	Moderate	Very high
Kidney	Very high	Very high	Very high	High	Low	High	Very high
Heart	Very high	Very high	Very high	Low	Low	Moderate	Very high
Crustaceans	Very high	Moderate	Very high	Low	Moderate	Low	Very high
Goat	Very high	Very high	Very high	Low	Low	Low	Very high
Beef	Very high	High	Very high	Low	Low	Low	Very high
Eggs	Very high	Moderate	Very high	Very high	Low	Very high	Very high
Cow milk	Very high	Low	High	Very high	Very high	Low	Very high
Canned fish w/ bones	Very high	Moderate	Very high	Low	Very high	Low	Very high
Lamb/mutton	Very high	High	Very high	Low	Low	Low	Very high
Cheese	Very high	Low	Very high	Very high	Very high	Low	Very high
Goat milk	High	Low	Moderate	High	Very high	Low	Low
Pork	High	Low	Very high	Low	Low	Low	Very high
Yoghurt	Moderate	Low	Low	Low	Very high	Low	Very high
Fresh fish	Moderate	Low	Moderate	Low	Low	Low	Very high
Pulses	Moderate	Moderate	Moderate	Low	Low	Very high	Low
Teff	Moderate	Very high	Moderate	Low	Low	High	Low
Vit A-rich fruit/veg	Low	Low	Low	Very high	Low	High	Low
Other vegetables	Low	Low	Low	Low	Low	Low	Low
Quinoa	Low	Moderate	Moderate	Low	Low	Very high	Low
Canned fish w/o bones	Low	Low	Moderate	Low	Low	Low	Very high
Seeds	Low	Low	High	Low	High	High	Low
Fonio	Low	Moderate	Moderate	Low	Low	Moderate	Low
Chicken	Low	Low	High	Low	Low	Low	High
Other fruits	Low	Low	Low	Low	Low	High	Low
Millet	Low	Moderate	Moderate	Low	Low	Moderate	Low
Unrefined grain prod	Low	Low	Moderate	Low	Low	Moderate	Low
Sorghum	Low	Moderate	Low	Low	Low	Low	Low
Roots/tubers/plantains	Low	Low	Low	Low	Low	Low	Low
Whole grains	Low	Low	Moderate	Low	Low	Low	Low
Nuts	Low	Low	Low	Low	Low	Low	Low
Refined grain products	Low	Low	Low	Low	Low	Low	Low
Refined grains	Low	Low	Moderate	Low	Low	Low	Low

Beal T & Ortenzi F. Priority micronutrient density in foods. Frontiers in Nutrition 2022

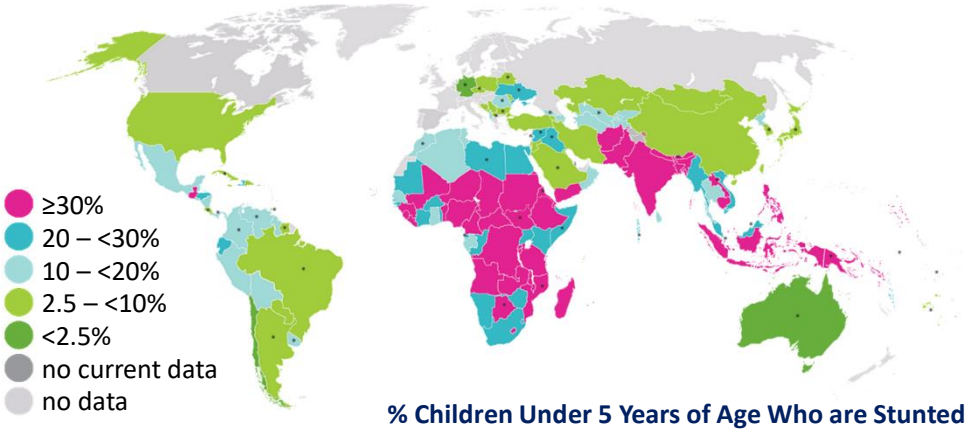
Average National Diets Low in Animal-source Foods Do Not Meet Needs for Essential Micronutrients



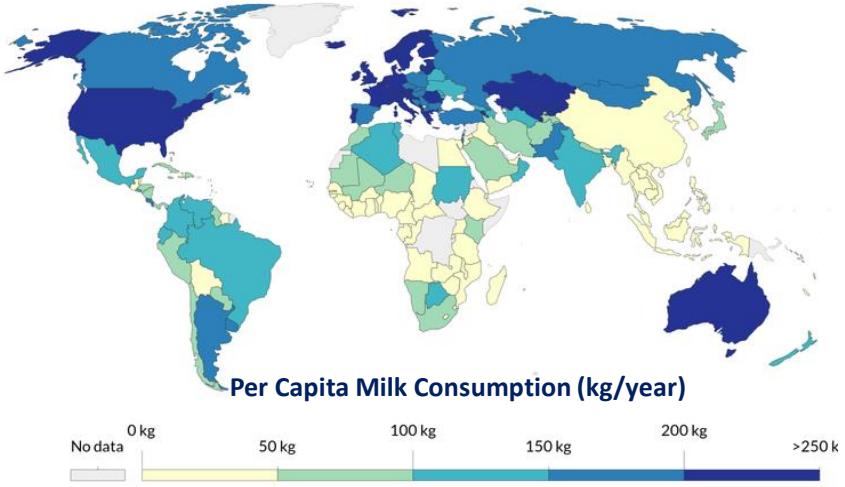
Nordhagen S, Beal T & Haddad L. The role of animal-source foods in healthy, sustainable, and equitable food systems. GAIN Discussion Paper 2020

Inverse Relationship between Childhood Stunting & Annual Meat, Milk & Seafood Consumption

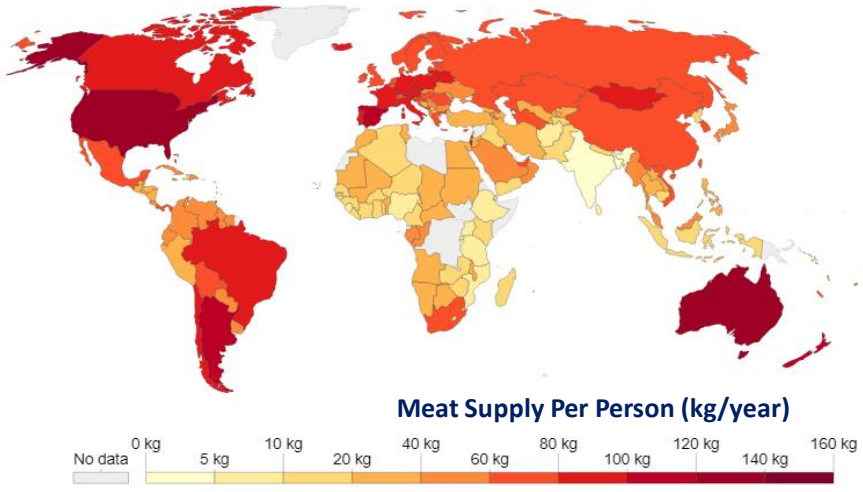
UNICEF, WHO, World Bank Joint Child Malnutrition dataset, March 2019 edition
UN Food and Agriculture Organization (FAO) 2017



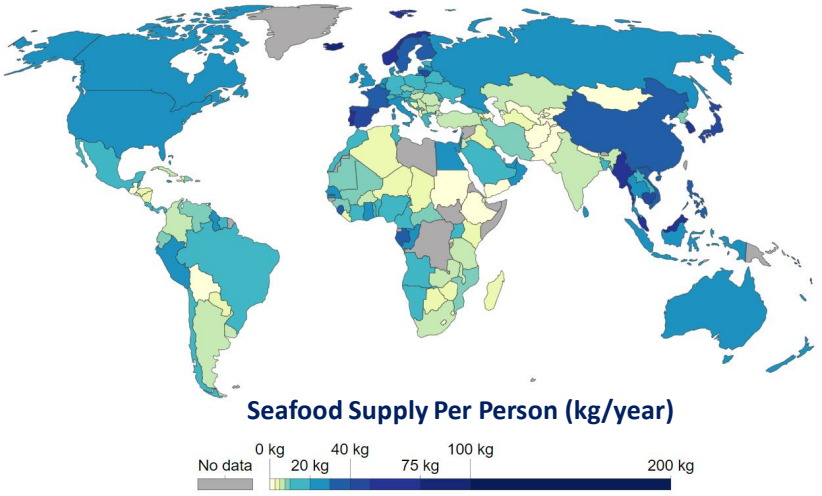
% Children Under 5 Years of Age Who are Stunted



Per Capita Milk Consumption (kg/year)



Meat Supply Per Person (kg/year)

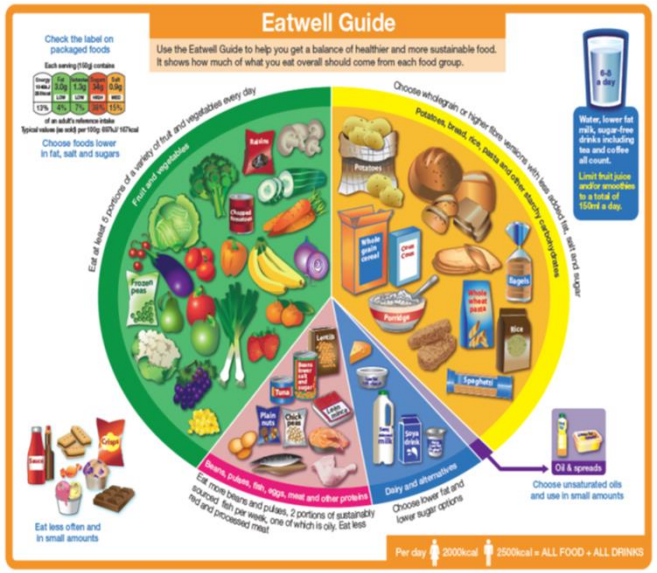


Seafood Supply Per Person (kg/year)

Climate Change Poses Potentially Catastrophic Threats to Human Health

The EAT-Lancet Commission Reference Diet Recommended;

- **Doubling Intakes of Fruits, Vegetables, Legumes, Nuts & Seeds,**
- **Halving Meat & Dairy Intakes**



Willett W et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. Lancet January 2019.

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

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

Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019

GBD 2019 Risk Factors Collaborators*

ARTICLES

https://doi.org/10.1038/s43016-021-00343-4

nature food

Check for updates

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

Katerina S. Stylianou[1]✉, Victor L. Fulgoni III[2] and Olivier Jolliet[1]✉

The 2020 report of The *Lancet* Countdown on health and climate change: responding to converging crises

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Global, regional, and national burden of stroke and its risk factors, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019

Lancet Neurol 2021; 20: 795–820

GBD 2019 Stroke Collaborators*

PLOS MEDICINE

RESEARCH ARTICLE

Estimating impact of food choices on life expectancy: A modeling study

Lars T. Fadnes[1,2]*, Jan-Magnus Økland[1,3], Øystein A. Haaland[1,3☯], Kjell Arne Johansson[1,2,3☯]

1 Department of Global Public Health and Primary Care, University of Bergen, Norway, 2 Bergen Addiction Research, Department of Addiction Medicine, Haukeland University Hospital, Bergen, Norway, 3 Bergen Center for Ethics and Priority Setting, University of Bergen, Norway

BMJ Global Health

Global red and processed meat trade and non-communicable diseases

Min Gon Chung[1,2] Yingjie Li[1,3] Jianguo Liu[1]

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Each single serving of Frankfurter sandwich results in 35 minutes of life lost

The 2020 report of The *Lan*

climate change: respondi

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:795–820

Exclusion of red and processed meats from the typical Western diet would increase life expectancy by 3 and 4 years for women and men respectively.

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nature food

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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).
- Willett W et al. Food in the Anthropocene: the **EAT–Lancet Commission** on healthy diets from sustainable food systems. Lancet January 2019.

GBD studies are led by the Institute for
Health Metrics and Evaluation, University of Washington, Seattle,
who recently described the GBD studies as

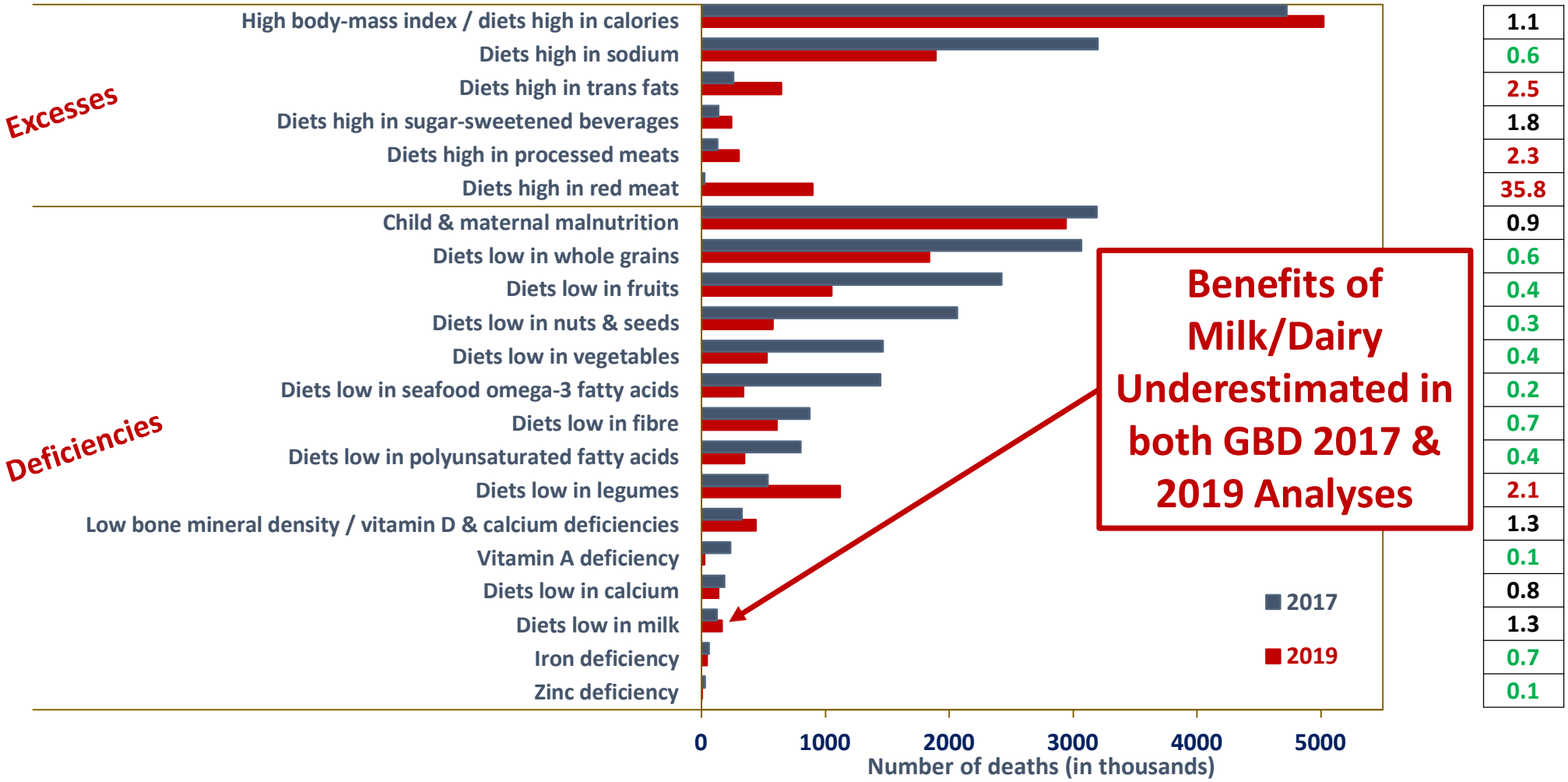
“THE DE-FACTO SOURCE FOR GLOBAL HEALTH ACCOUNTING”.

Dietary Risks and Deaths

GBD 2017 Analysis *Versus* *GBD* 2019 Analysis

Christopher JL Murray & GBD 2017 Diet Collaborators. Lancet 2019I
Institute for Health Metrics and Evaluation (2018) GBD Compare. Seattle, WA: IHME, University of Washington. http://vizhub.healthdata.org/gbd-compare.

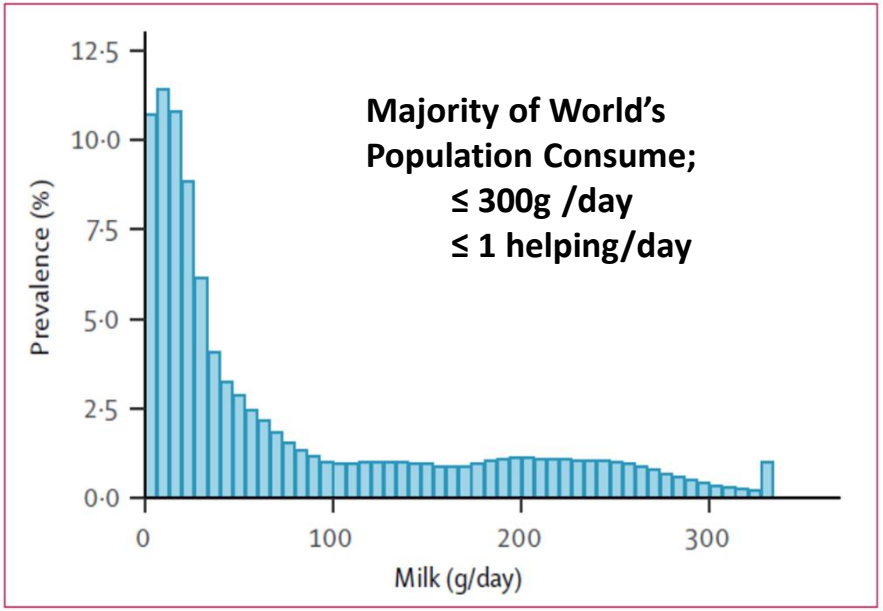
Christopher JL Murray et al. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019 Lancet 2020



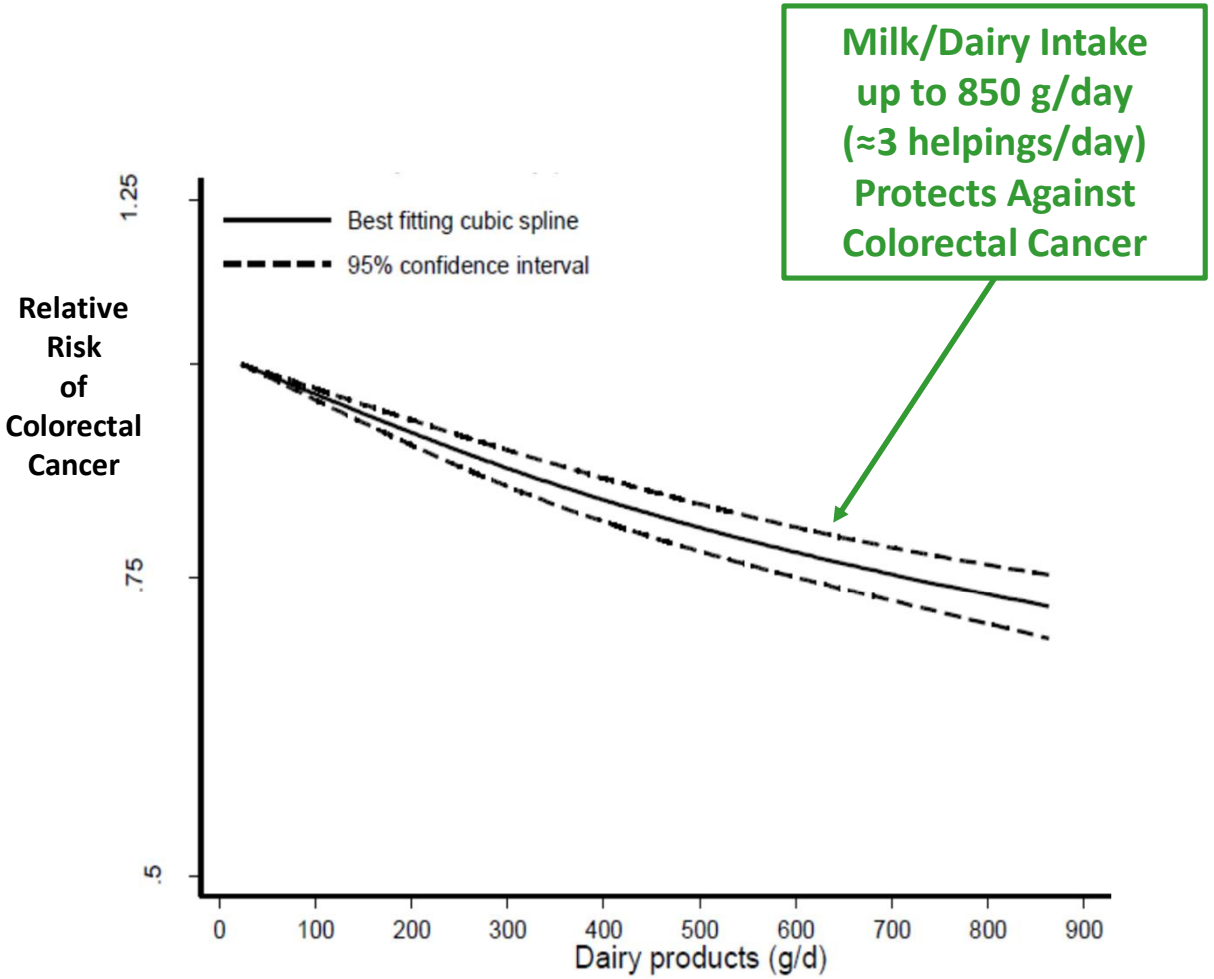
Benefits of Milk/Dairy Underestimated in both GBD 2017 & 2019 Analyses

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
0.4
2.1
1.3
0.1
0.8
1.3
0.7
0.1

Milk & Dairy Consumption & Relationship with Colorectal Cancer



GBD 2019 Estimation of Milk Consumption



World Cancer Research Fund/ American Institute for Cancer Research. Diet, Nutrition, Physical Activity & Cancer: a Global Perspective. Continuous Update Project Expert Report 2018.

At Least 2 Full-Fat Dairy Servings/Day 32% Less Cardiovascular Events & 25% Less Mortality

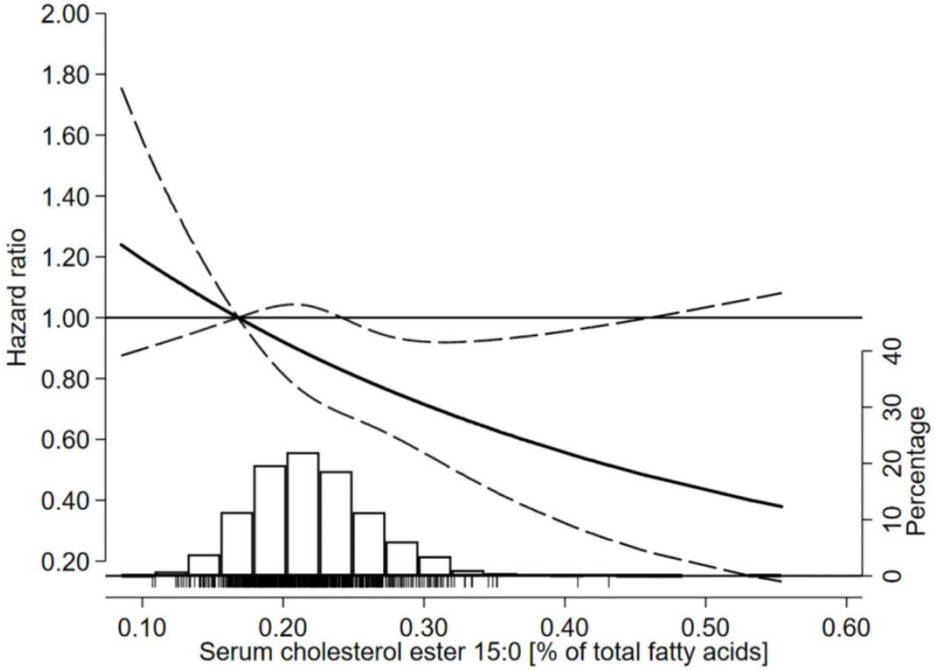
	n	Events	HR (95% CI)	p_{trend}
Total mortality				0·01
<0·5 servings per day	12399	547 (4·4%)	1·00 (1·00–1·00)	
0·5–1 servings per day	12023	374 (3·1%)	0·84 (0·71–0·98)	
1–2 servings per day	8853	317 (3·6%)	0·89 (0·74–1·06)	
>2 servings per day	7552	248 (3·3%)	0·75 (0·60–0·92)	
Major cardiovascular disease				0·0001
<0·5 servings per day	12399	624 (5·0%)	1·00 (1·00–1·00)	
0·5–1 servings per day	12023	538 (4·5%)	0·88 (0·76–1·06)	
1–2 servings per day	8853	308 (3·5%)	0·76 (0·64–0·90)	
>2 servings per day	7552	278 (3·7%)	0·68 (0·56–0·84)	

0·5 1 1·5

Dehghan M et al. Association of dairy intake with cardiovascular disease and mortality in 21 countries from five continents (PURE): a prospective cohort study. Lancet 2018

CVD Risk Lowest with Highest Levels of Serum Pentadecanoic Acid

(Biomarker of Dairy Fat Intake)



Trieu K et al. Biomarkers of dairy fat intake, incident cardiovascular disease, and all cause mortality: A cohort study, systematic review, and meta-analysis. PLoS Med 2021; 18(9): e1003763.

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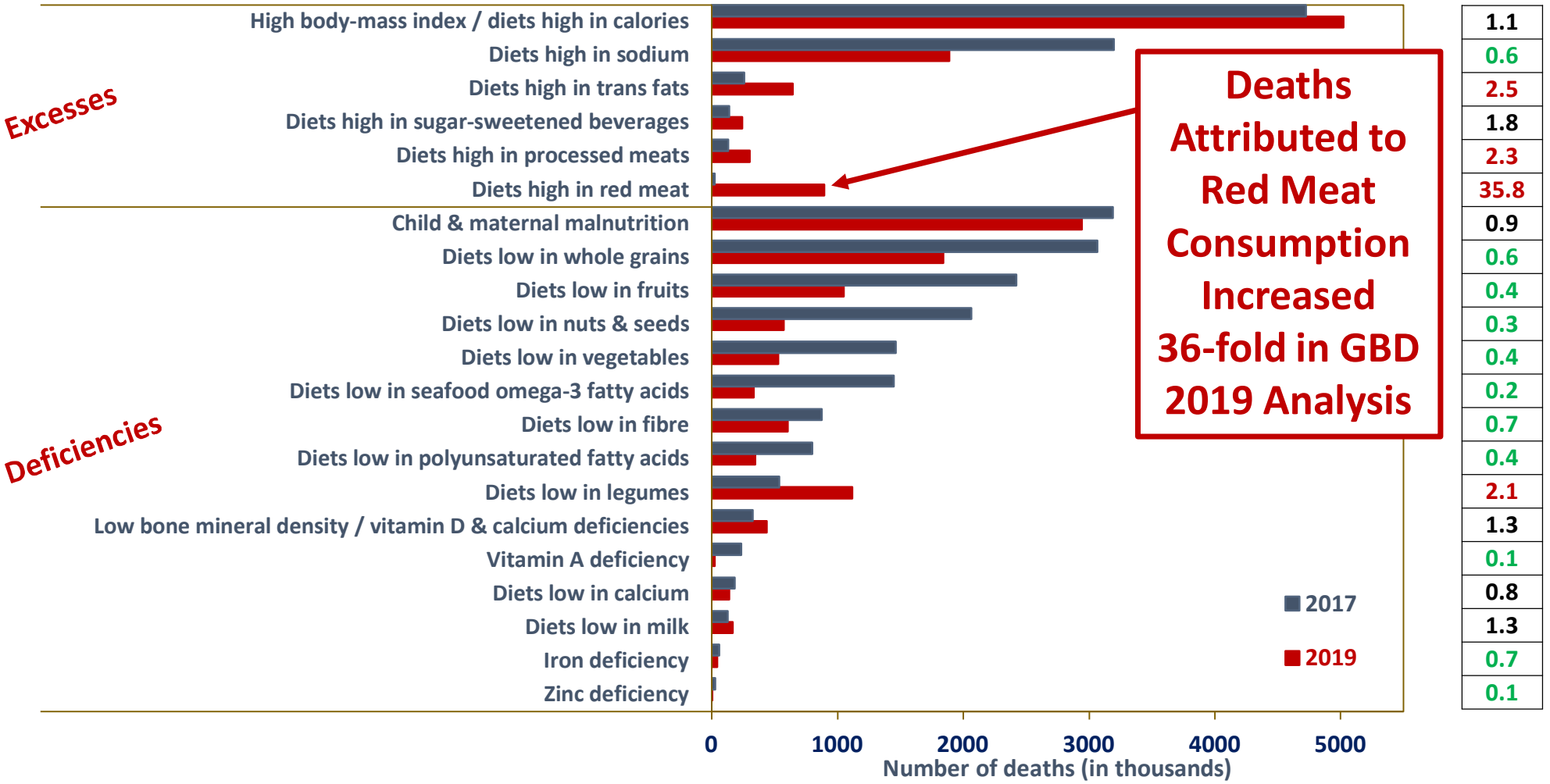

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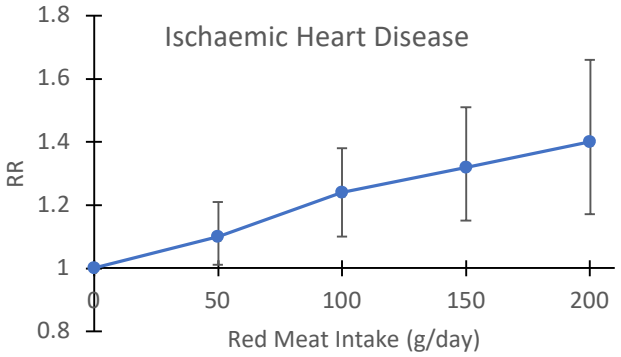
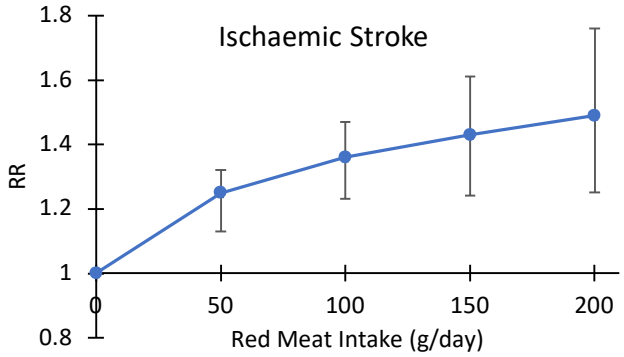
0.7
0.4
2.1
1.3
0.1
0.8
1.3
0.7
0.1

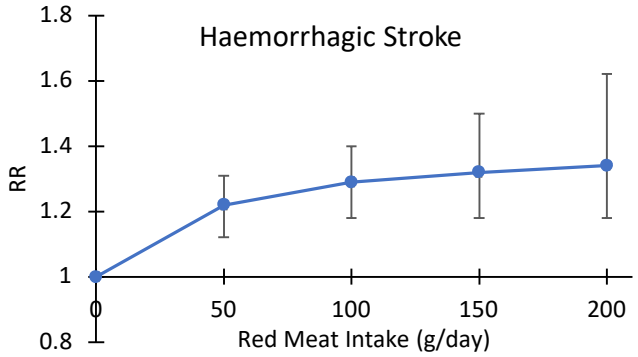
Global Burden of Disease Study 2019

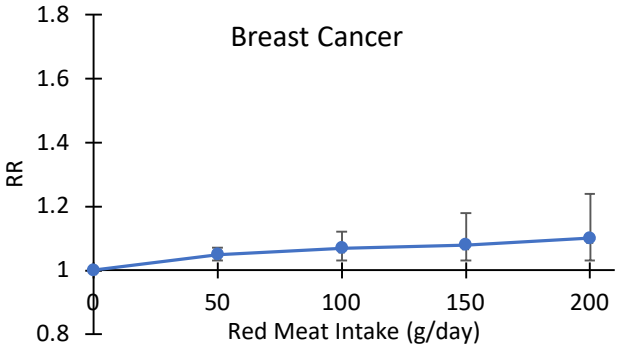
New systematic reviews and meta-regressions

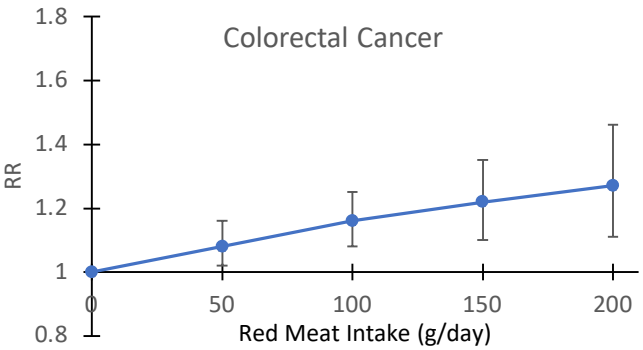
"Sufficient evidence supporting the causal relationship of red meat intake with 6 adverse outcomes"

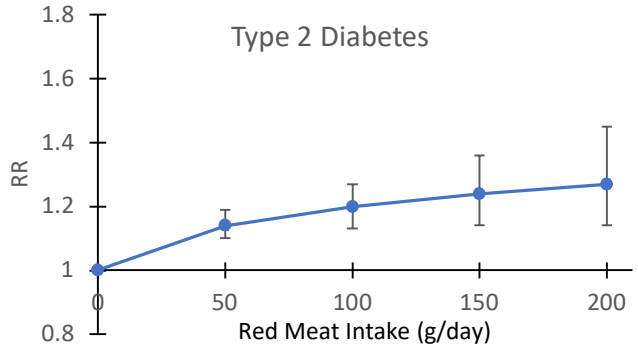










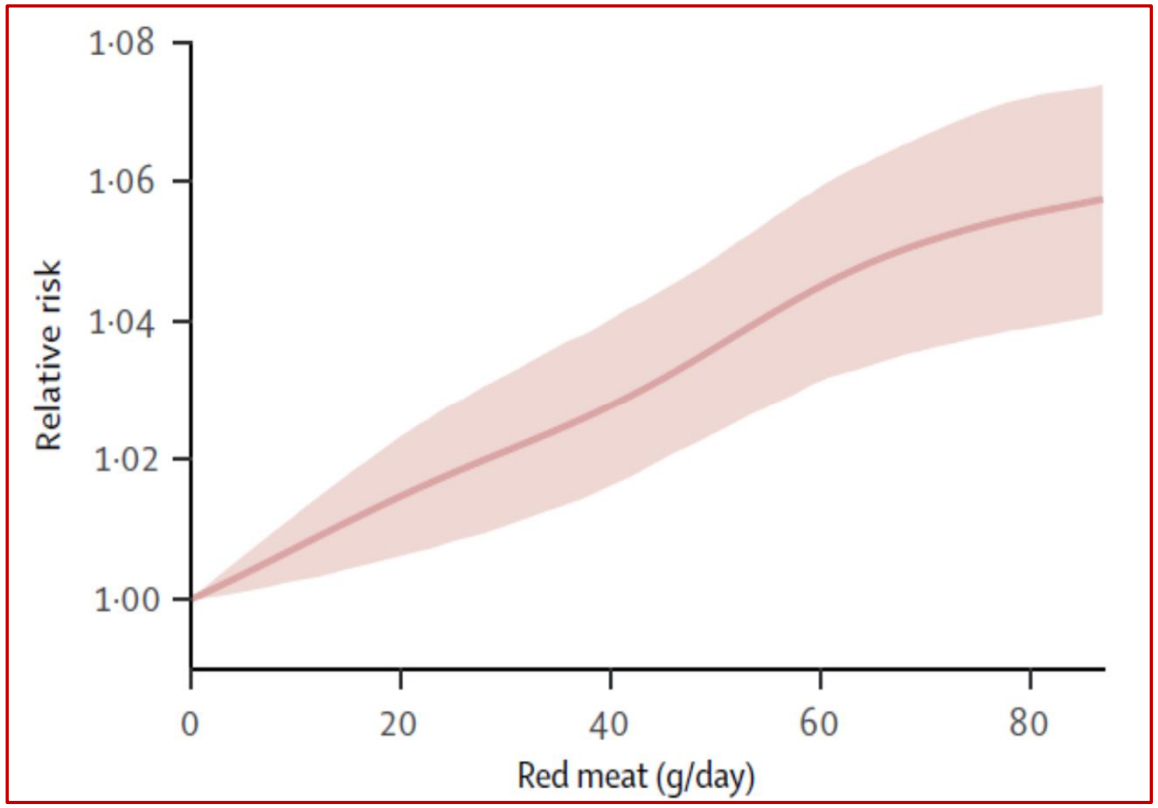


Global Burden of Disease Study 2019

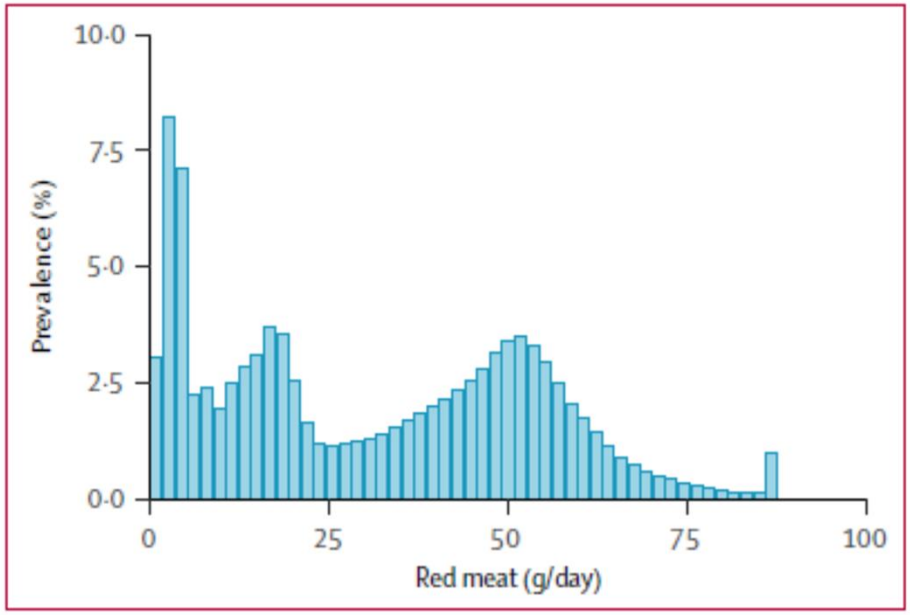
More empirical standardised methods for selecting the theoretical minimum risk exposure level (TMREL)

"Red meat TMREL changed from 22·5g/day to 0 g/day."

Red Meat Consumption & All-Cause Mortality Risk

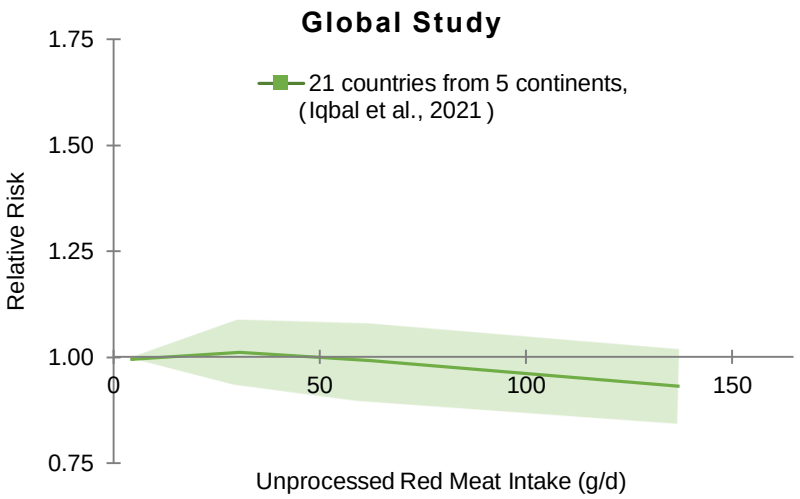


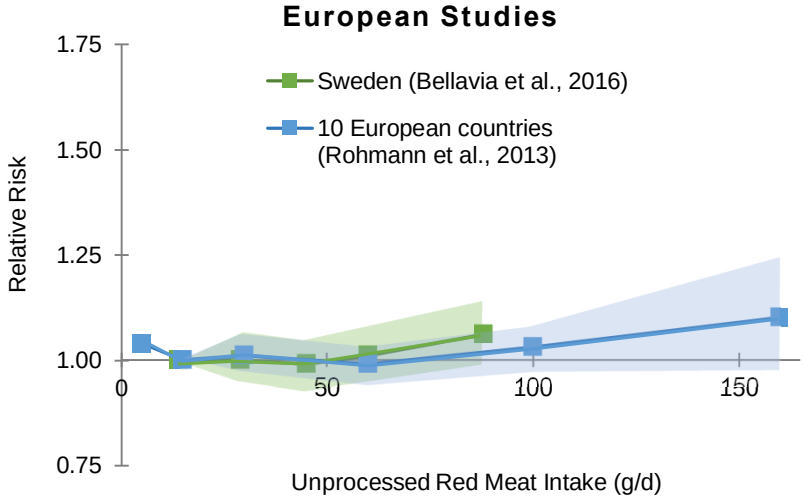
Estimation of Red Meat Consumption

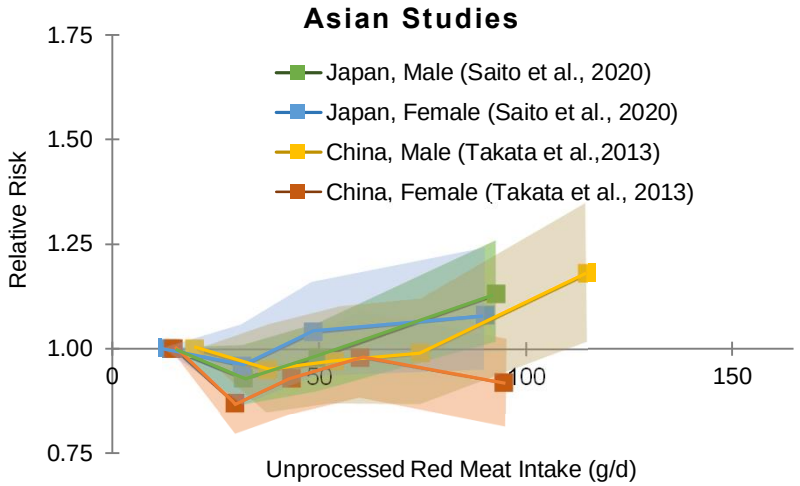


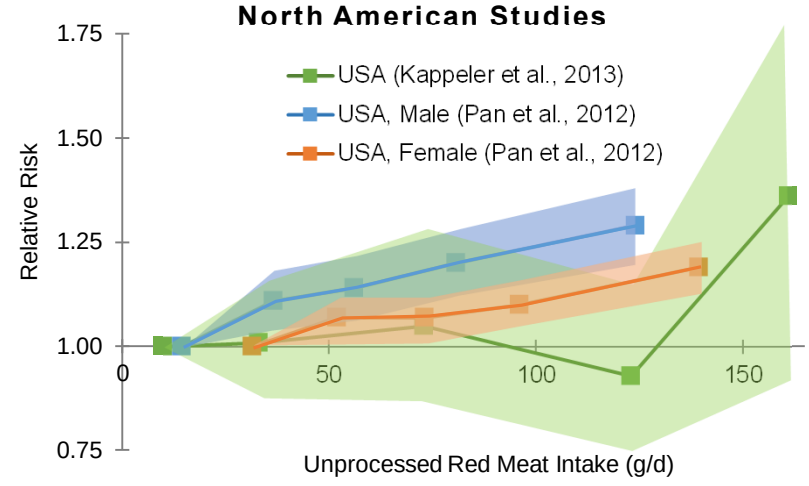
Huge Majority of World's Population Consume;
≤ 75g /day
≤ 500 g / week or
≤ 4 portions/week

Relative Risk for All-Cause Mortality from Large Published Cohort Studies









THE LANCET

CORRESPONDENCE | VOLUME 399, ISSUE 10332, E23-E26, APRIL 02, 2022

36-fold higher estimate of deaths attributable to red meat intake in GBD 2019: is this reliable?

Alice V Stanton, Frédéric Leroy, Christopher Elliott, Neil Mann, Patrick Wall, Stefaan De Smet

Published: February 25, 2022DOI:https://doi.org/10.1016/S0140-6736(22)00311-7

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?

THE LANCET

CORRESPONDENCE | VOLUME 399, ISSUE 10332, E27-E28, APRIL 02, 2022

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, 2022DOI: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**

THE LANCET

CORRESPONDENCE| VOLUME 400, ISSUE 10350, P427-428, AUGUST 06, 2022

Troubling assumptions behind GBD 2019 on the health risks of red meat

Vanessa L Z Gordon-Dseagu, Martin J Wiseman, Kate Allen, Judy Buttriss, Christine Williams

Published: August 06, 2022 DOI:https://doi.org/10.1016/S0140-6736(22)01283-1

Academy of Nutrition Sciences & World Cancer Research Fund Authors' Key Comments

"We support Stanton and colleagues' call for **further clarification, justification, or reconsideration of the TMREL 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

Irish Farmers Journal

Leading scientists challenge findings that red meat is harmful

Farming Independent

Scientists challenge data linking red meat to health risks

THE GROCER MEAT

Growing concerns over widely-used Global Burden of Disease meat data

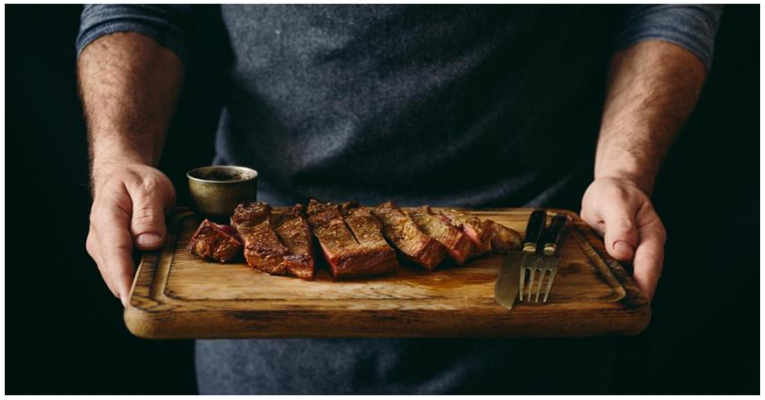
By Kevin White 4 March 2022

agriland.ie

IFA contacts international bodies on red meat data concerns

The Sunday Times

Valerie Flynn August 28th 2022



'Serious errors' in research linking deaths to red meat'

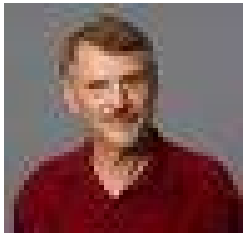
Scientists claim a study ignored nutritional benefits and have called on The Lancet to correct or retract the findings

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.

SOCIAL MEDIA	1,782
Å Tweets	1,235
Å Facebook	547

Gordon H. Guyatt

@GuyattGH



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

nature medicine

ARTICLES

https://doi.org/10.1038/s41591-022-01968-z

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Health effects associated with consumption of unprocessed red meat: a Burden of Proof study

Haley Lescinsky[1], Ashkan Afshin[1,2], Charlie Ashbaugh[1], Catherine Bisignano[1], Michael Brauer[1,2,3], Giannina Ferrara[1], Simon I. Hay[1,2], Jiawei He[1,2], Vincent Iannucci[1], Laurie B. Marczak[1], Susan A. McLaughlin[1], Erin C. Mullany[1], Marie C. Parent[1], Audrey L. Serfes[1], Reed J. D. Sorensen[1], Aleksandr Y. Aravkin[1,2,4], Peng Zheng[1,2] and Christopher J. L. Murray[1,2]

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- No evidence of an association between unprocessed red meat and ischaemic stroke or haemorrhagic stroke.
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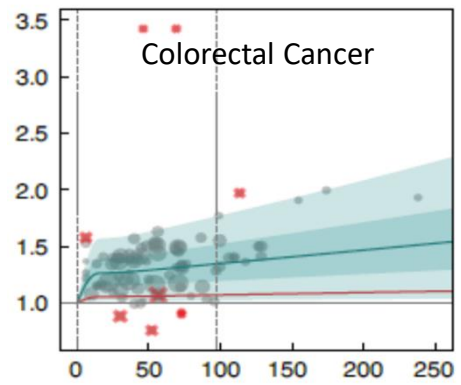
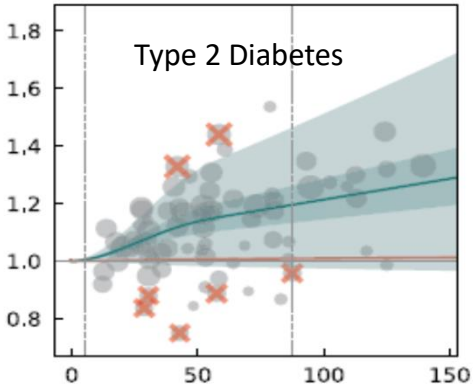
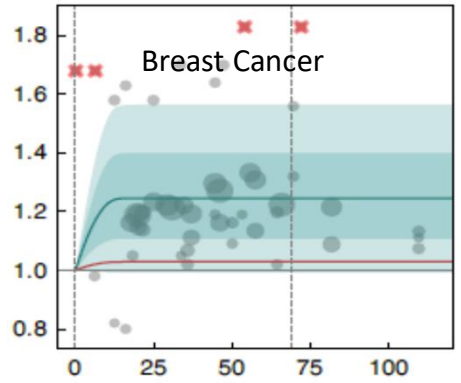
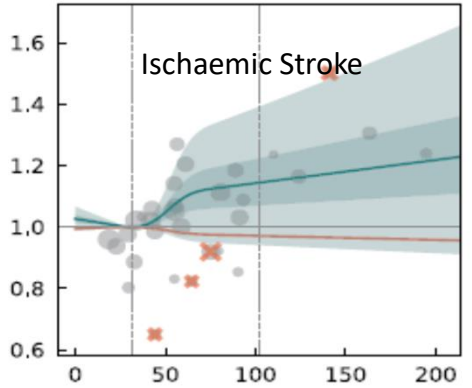
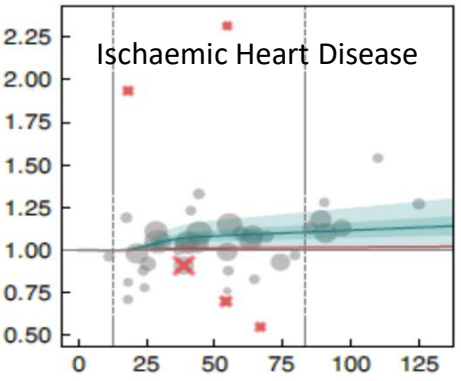
- Evidence that eating unprocessed red meat is associated with increased risk of disease is weak - insufficient to make stronger or more conclusive recommendations.

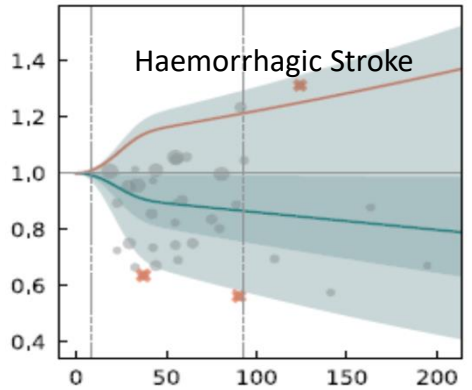












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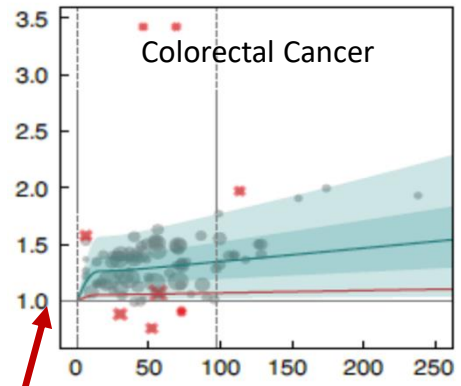
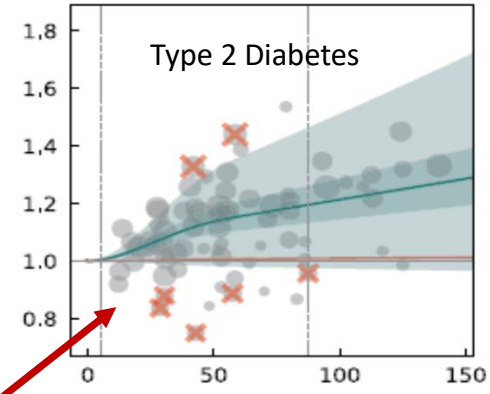
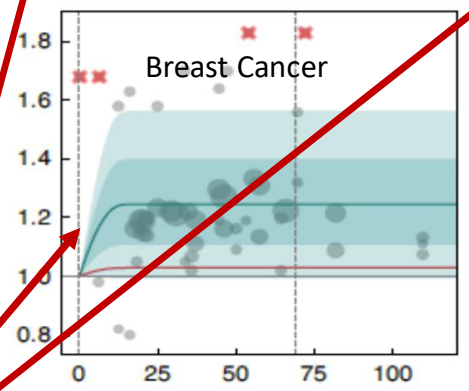
- No evidence of a [illegible] between unprocessed red meat [illegible] stro[illegible]
- 9[illegible] wide[illegible]
- Evidence that eating unprocessed red meat is associated with increased risk of disease is weak - insufficient to make stronger or more conclusive recommendations.

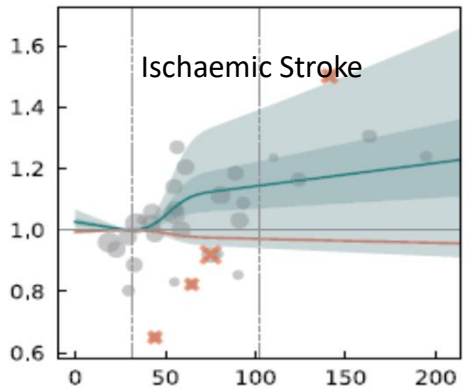
Relationship with breast cancer , type 2 diabetes, and ischaemic heart disease not statistically significant – but still awarded 2 stars

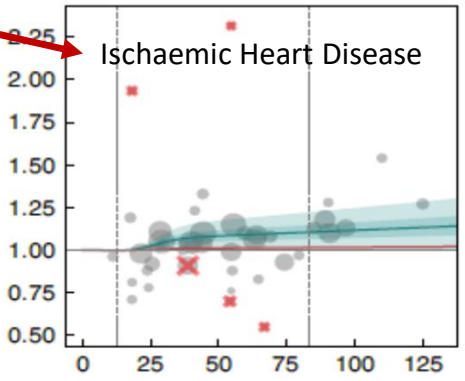
???

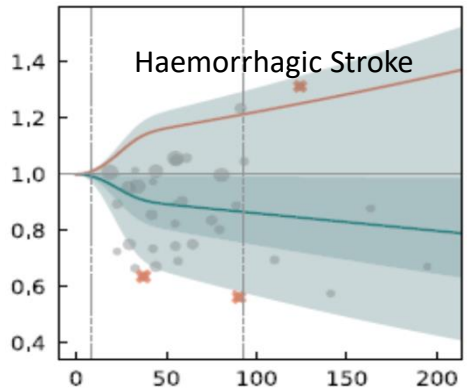












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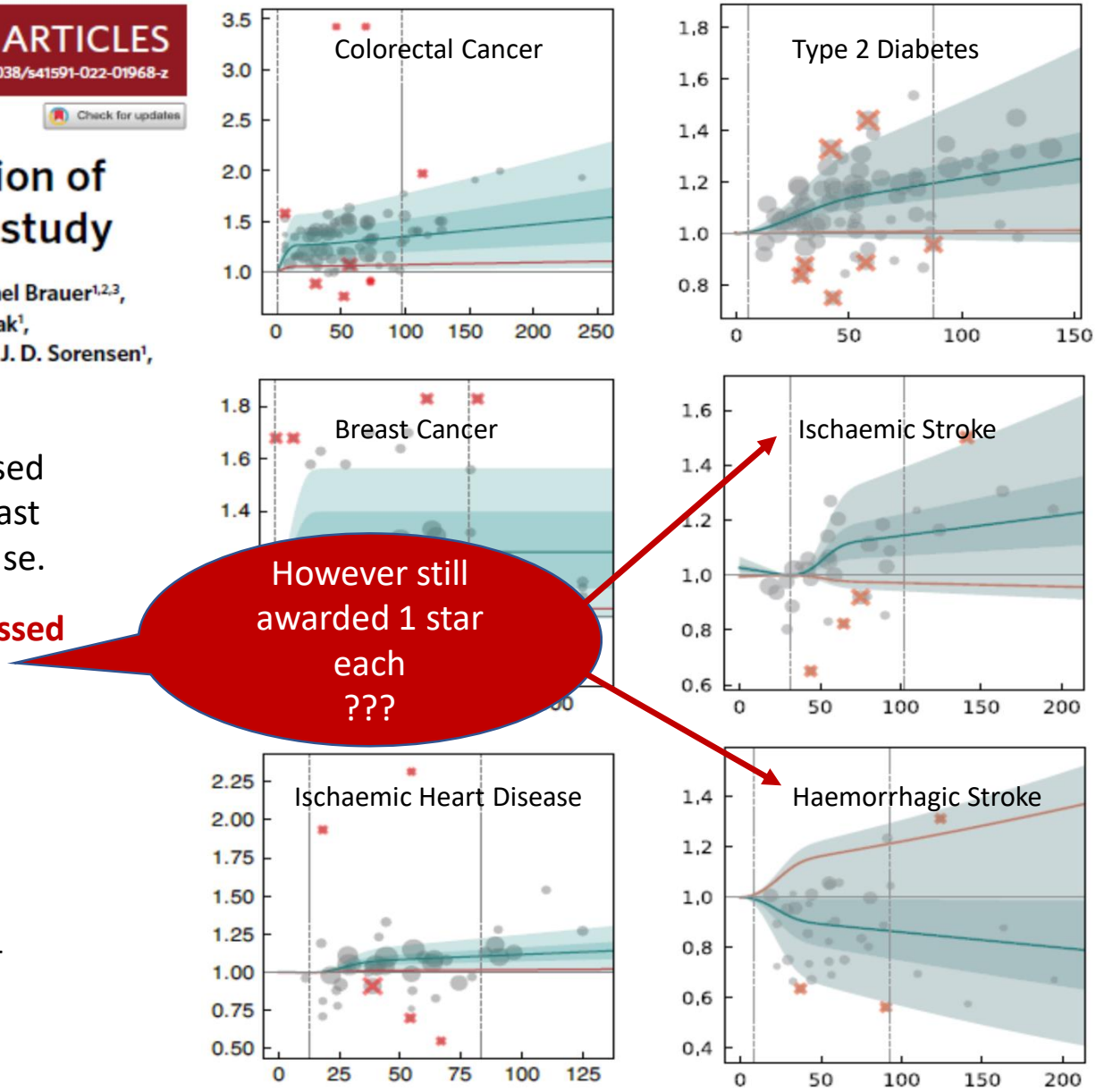

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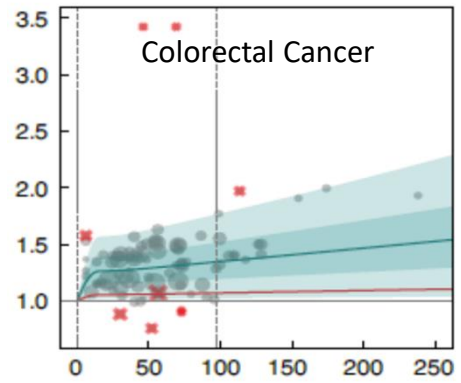
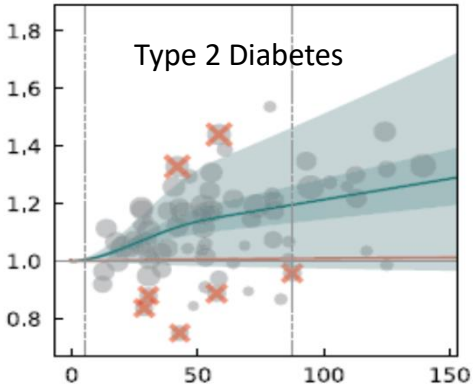
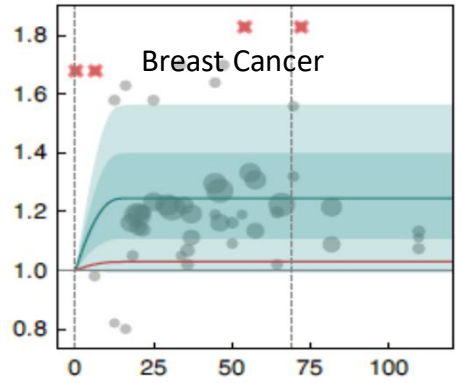
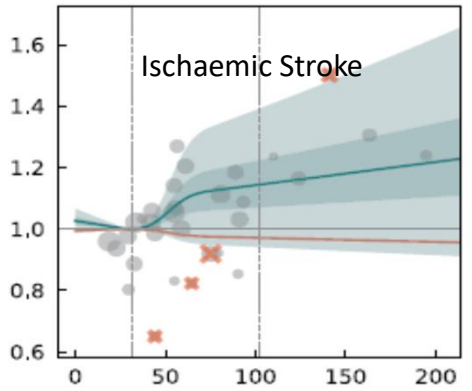
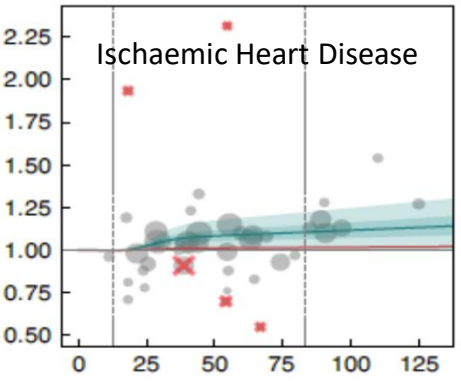
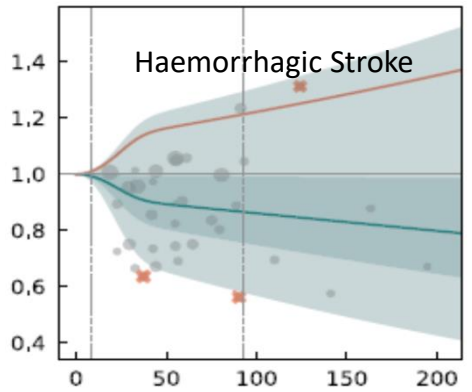






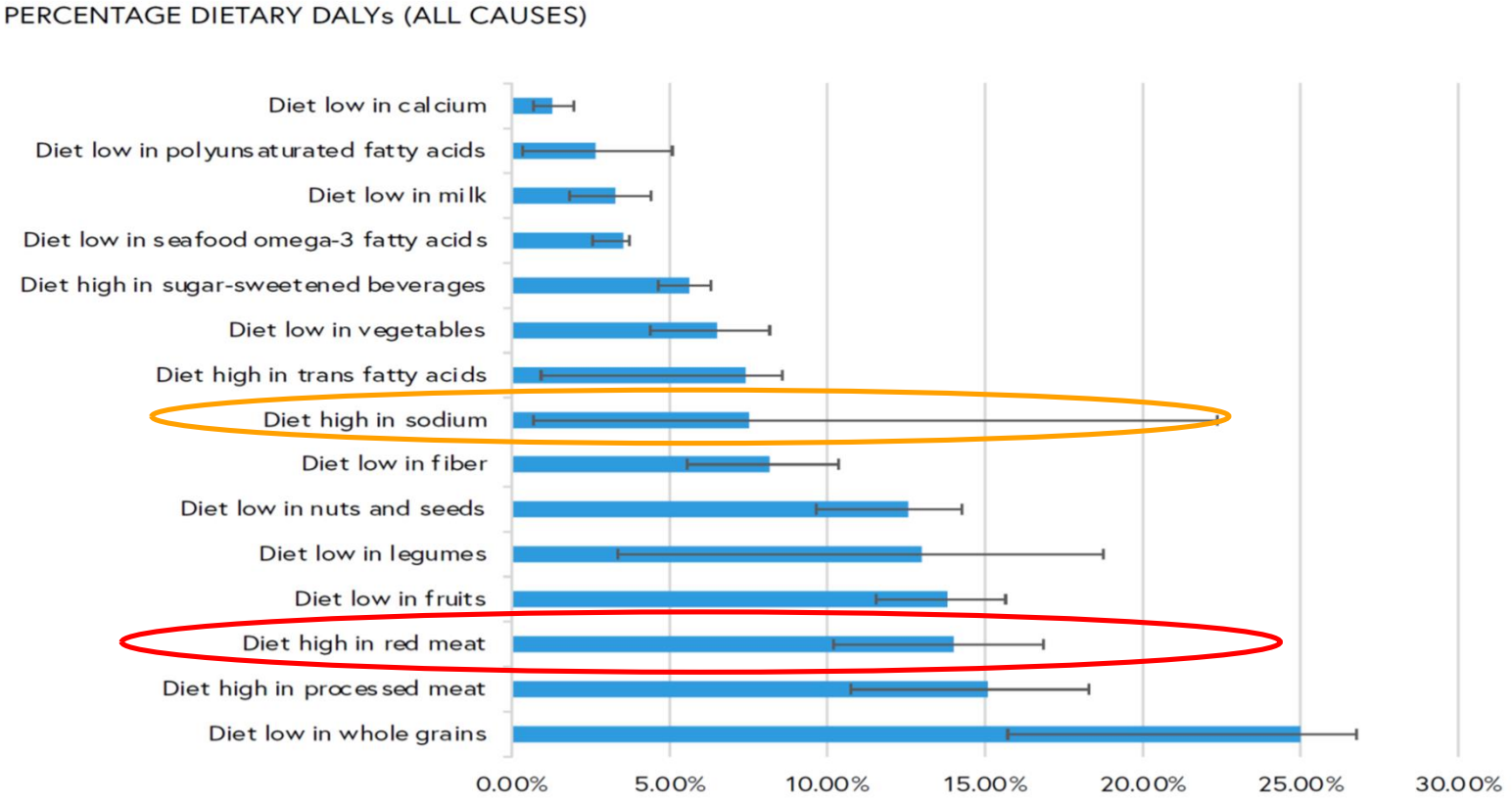






The National Food Strategy: The Evidence – July 2021

The dietary risk factors for all-cause DALYs



SOURCE: Global Burden of disease, 2019 data. Accessed March 2021. GBD Results Tool | GHDx (healthdata.org)

THE LANCET

Published online October 25, 2022

The 2022 report of the *Lancet* Countdown on health and climate change: health at the mercy of fossil fuels

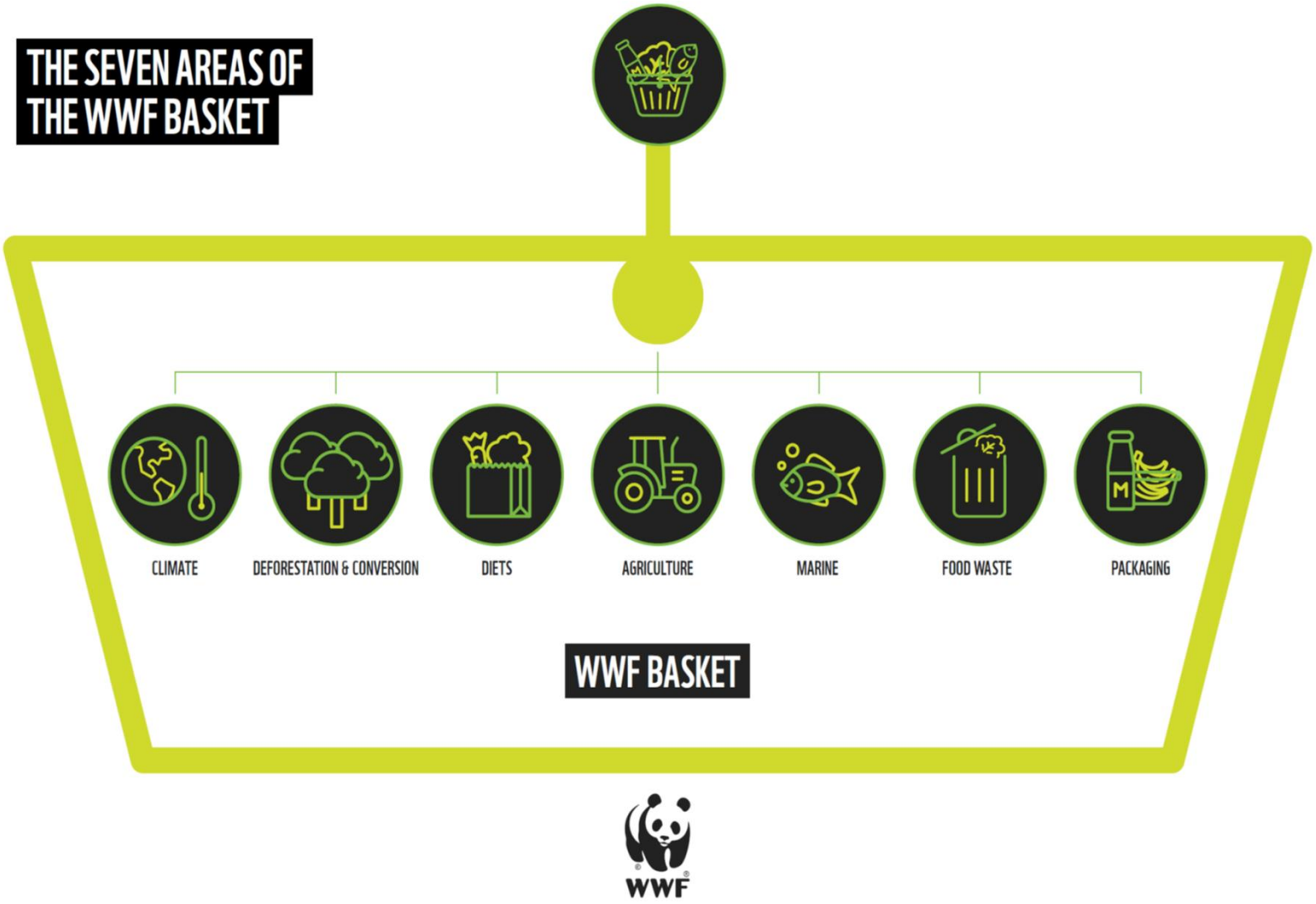
Marina Romanello, Claudia Di Napoli, Paul Drummond, Carole Green, Harry Kennard, Pete Lampard, Daniel Scamman, Nigel Arnell, Sonja Ayeb-Karlsson, Lea Berrang Ford, Kristine Belesova, Kathryn Bowen, Wenjia Cai, Max Callaghan, Diarmid Campbell-Lendrum, Jonathan Chambers, Kim R van Daalen, Carole Dalin, Niheer Dasandi, Shouro Dasgupta, Michael Davies, Paula Dominguez-Salas, Robert Dubrow, Kristie L Ebi, Matthew Eckelman, Paul Ekins, Luis E Escobar, Lucien Georgeson, Hilary Graham, Samuel H Gunther, Ian Hamilton, Yun Hang, Risto Hänninen, Stella Hartinger, Kehan He, Jeremy J Hess, Shih-Che Hsu, Slava Jankin, Louis Jamart, Ollie Jay, Ilan Kelman, Gregor Kiesewetter, Patrick Kinney, Tord Kjellstrom, Dominic Kniveton, Jason K W Lee, Bruno Lemke, Yang Liu, Zhao Liu, Melissa Lott, Martin Lotto Batista, Rachel Lowe, Frances MacGuire, Maquins Odhiambo Sewe, Jaime Martinez-Urtaza, Mark Maslin, Lucy McAllister, Alice McGushin, Celia McMichael, Zhifu Mi, James Milner, Kelton Minor, Jan C Minx, Nahid Mohajeri, Maziar Moradi-Lakeh, Karyn Morrissey, Simon Munzert, Kris A Murray, Tara Neville, Maria Nilsson, Nick Obradovich, Megan B O'Hare, Tadj Oreszczyn, Matthias Otto, Fereidoon Owfi, Olivia Pearman, Mahnaz Rabbaniha, Elizabeth J Z Robinson, Joacim Rocklöv, Renee N Salas, Jan C Semenza, Jodi D Sherman, Liuhua Shi, Joy Shumake-Guillemot, Grant Silbert, Mikhail Sofiev, Marco Springmann, Jennifer Stowell, Meisam Tabatabaei, Jonathon Taylor, Joaquin Triñanes, Fabian Wagner, Paul Wilkinson, Matthew Winning, Marisol Yglesias-González, Shihui Zhang, Peng Gong, Hugh Montgomery*, Anthony Costello**

Diet and Health Co-benefits—Headline Finding

In 2019, 11·5 million deaths were attributable to imbalanced diets.

17% (2 million) of them were related to red and processed meat and dairy consumption.

WWF's ambition is to halve the environmental impact of UK supermarket baskets by 2030



OUTCOMES & MEASURES TO 2030

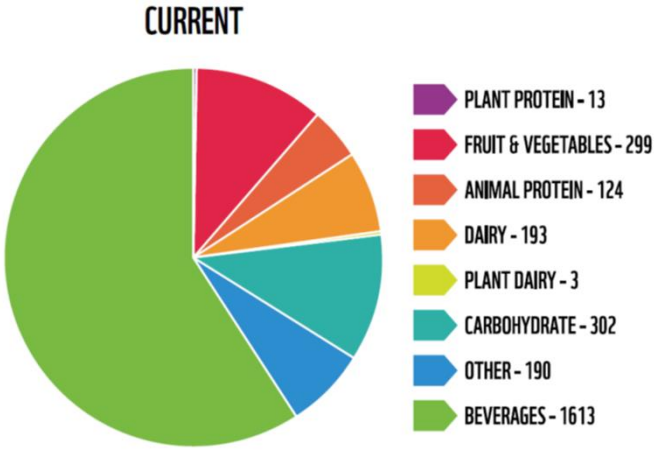
AREA	UK BASKET OUTCOME	RETAILER PROGRESS MEASURES
 DIETS	50/50 plant/animal protein sales split	% of protein sales from animal-based and plant-based sources
 AGRICULTURE	At least 50% of whole produce and grains certified or covered by a robust environmental scheme	% of produce & grains sourcing in a robust environmental scheme
	100% meat, dairy and eggs, including as ingredients sourced to 'Better' standard	% meat, dairy and eggs sourced to 'Better' standards
	At least 50% of fresh food from areas with sustainable water management	% of sourcing from regions with sustainable water management
	Agricultural emissions lowered inline with 1.5 - degree SBT	% of protein, produce & grain farms monitoring GHG footprint
		% reduction in sourcing from lowland peat
		% reduction in agricultural GHGs

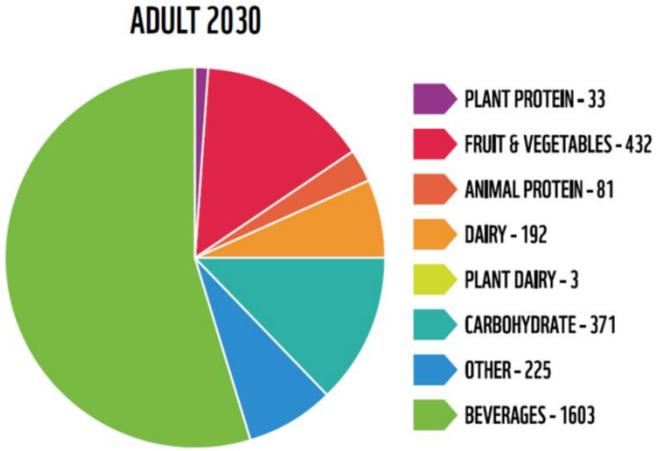
WWF Basket Outcome for Diet
50/50 plant/animal protein sales split (% tonnage)

- Targets
  - Reduce the UK's biomass consumption footprint by 50% by 2030
  - **Reduce the consumption of meat and dairy by at least 20%** and increase the proportion of plant-based foods in the average diet.
- Blueprint for Action includes;
  - Focus marketing on normalizing healthy, sustainable diets and supporting customers to **make choices that are more aligned with the Livewell diet**.
  - Use **'nudges'** to change consumer purchasing behaviors
    - Plant-based alternatives near meat
    - Plant-based alternatives on **priority shelf space**
  - Rebalance product pricing – **reduce/remove price promotions** from meat products.
  - **Reduce advertising** spend on meat and dairy products.

Livewell Principles

Pie-charts of the Composition of the Current Adult Diet (NDNS) and the Recommended Adult Livewell Plate for 2030





Units = g/day

Plant protein: legumes and meat replacers

Animal protein: meat, fish and eggs.

Plant dairy: soy drink and soy yoghurt

Not 50/50 Split

29/71 plant/animal protein split

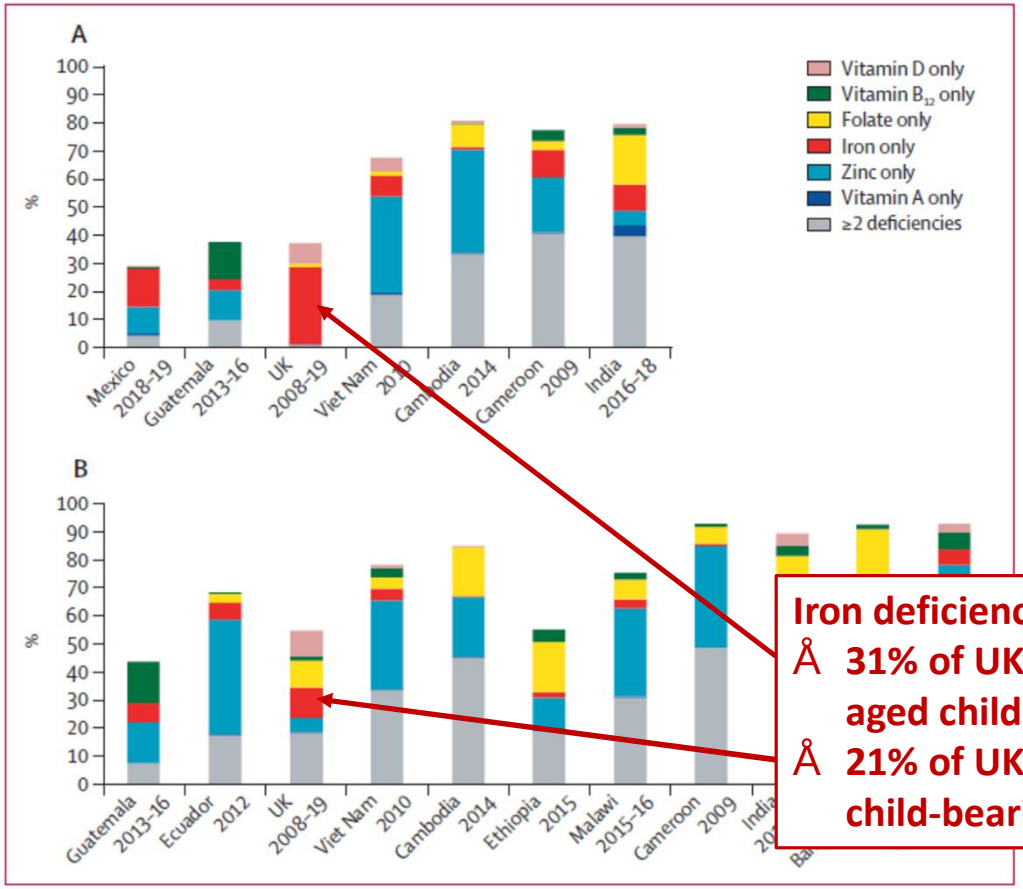
2/98 plant dairy/animal dairy split

Composition of Protein Foods in the Current Adult Diet (NDNS) and the Recommended Adult Livewell Plate for 2030

	Adult Current g/day	Adult 2030 g/day	Change %
Legumes, nuts & oilseeds	11	28	**155**
Meat replacers	2	5	**150**
Beef & veal	18	4	**-78**
Pork	7	5	-29
Lamb	6	4	-33
Poultry	30	9	**-70**
Processed meat	29	12	**-59**
Fish wild-caught	19	19	0
Fish aquaculture	7	21	**200**
Dairy	179	186	4
Cheese	14	6	**-57**
Dairy replacers	3	3	0
Eggs and egg products	8	7	-13

Consumption of these foods are to reduce by considerably more than 20%

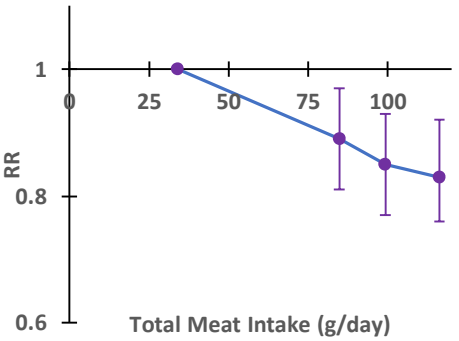
Potential Impact of Such Meat Reductions on Iron Deficiency Anaemia in the UK

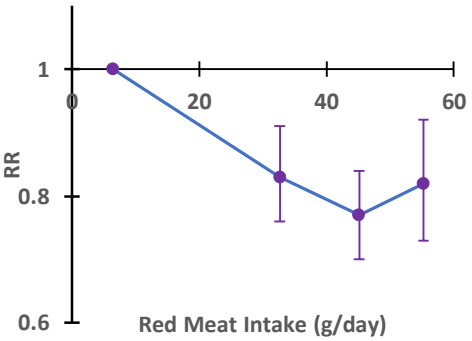


Iron deficiency in

- **31% of UK pre-school-aged children, &**
- **21% of UK women of child-bearing age**

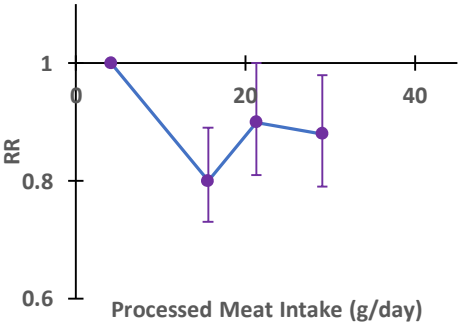
Stevens GA et al. Micronutrient deficiencies among preschool-aged children and women of reproductive age worldwide: a pooled analysis. The Lancet Global Health, 2022; 10: e1590-e1599

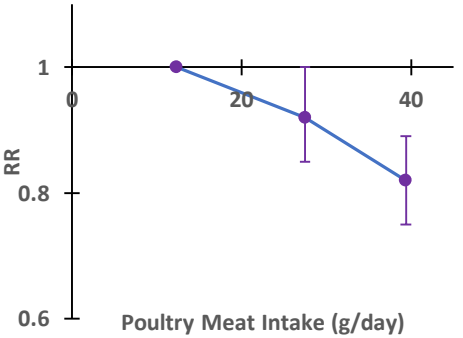




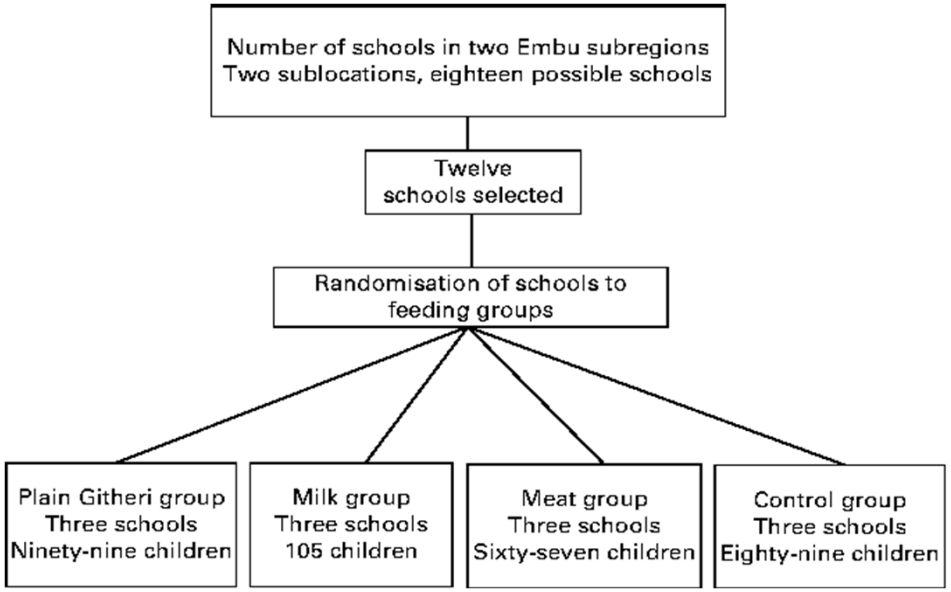
Meat consumption and risk of iron deficiency anaemia in 475,000 men and women in the UK Biobank Study.

Papier K et al.
*BMC Med **19**, 53 (2021).*

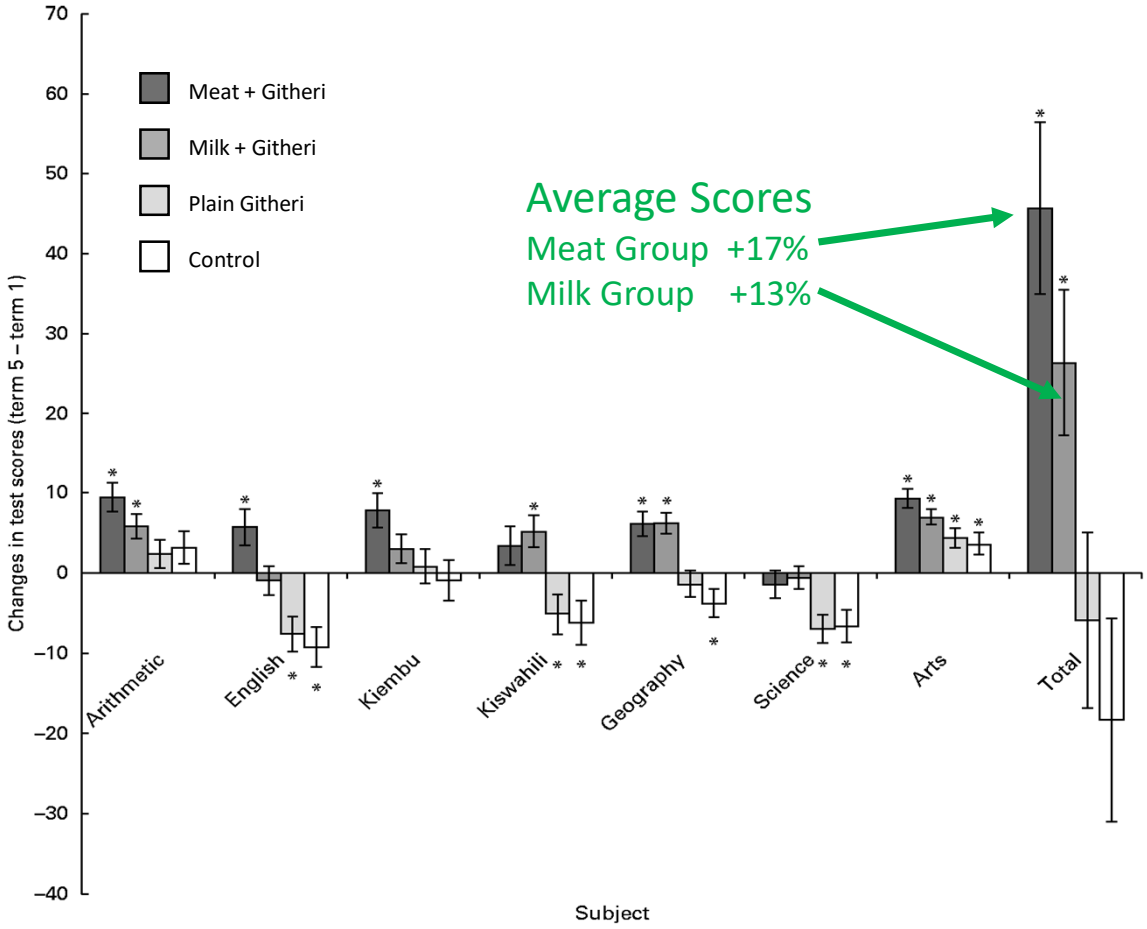




Primary school test scores of children after 5 semesters of receiving animal sourced foods (meat or dairy) were significantly greater than those of the control groups (plant-based foods or no additional nutrition).



Serving size	Githeri + meat 225 g (includes 85 g meat)	Githeri + milk 100 g + 250 ml milk	Plain githeri 230 g + 3·8 g oil
Energy (kJ)	1310	1310	1310
Energy (kcal)	313	313	313
Total protein (g)	21·7	15·2	8·4
Total Fe (mg)	2·94	1·57	3·93
Available Fe (mg)	0·48	0·10	0·20
Total Zn (mg)	2·89	1·66	1·68
Available Zn (mg)	0·44	0·38	0·23
Vitamin B_{12} (μg)	1·17	1·04	0·00
Ca (mg)	21·3	306·0	33·8



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 also not optimal for older adults

International Journal of General Medicine

Dovepress
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Open Access Full Text Article

ORIGINAL RESEARCH

Total Meat Intake is Associated with Life Expectancy: A Cross-Sectional Data Analysis of 175 Contemporary Populations

Wenpeng You[1,2], Renata Henneberg[1], Arthur Saniotis[1,3], Yanfei Ge[4,5], Maciej Henneberg[1,6]

24-Feb-2022

THE GERONTOLOGICAL SOCIETY OF AMERICA®

Journals of Gerontology: Medical Sciences
cite as: *J Gerontol A Biol Sci Med Sci*, 2022, Vol. XX, No. XX, 1–7
https://doi.org/10.1093/gerona/glab334
Advance Access publication November 27, 2021

OXFORD

Research Report

Animal Protein Intake Is Inversely Associated With Mortality in Older Adults: The InCHIANTI Study

Tomás Meroño, PhD,[1,2,•] Raúl Zamora-Ros, PhD,[1,3,*] Nicole Hidalgo-Liberona, PhD,[1,2,•] Montserrat Rabassa, PhD,[1] Stefania Bandinelli, MD,[4] Luigi Ferrucci, MD, PhD,[5,•] Massimiliano Fedecostante, MD,[6] Antonio Cherubini, MD, PhD,[6,†,•] and Cristina Andres-Lacueva, PhD[1,2,†]

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
<u>Even More</u> 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 <u>not</u> as true replacements in terms of nutrition"

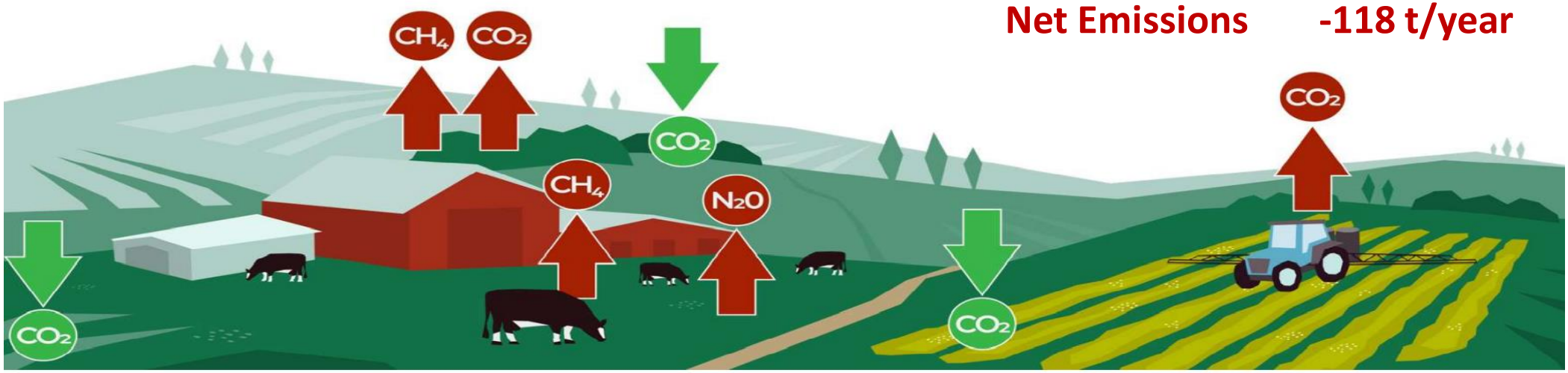
Van Vliet S et al. Plant-Based Meats, Human Health & Climate Change. Frontiers in Sustainable Food Systems 2020.

Devenish Lands at Dowth

Combination of Soil Improvement Programme & Multispecies Swards Delivers Net Zero

Carbon emissions from ruminants more than off-set by carbon sequestered by the landscape

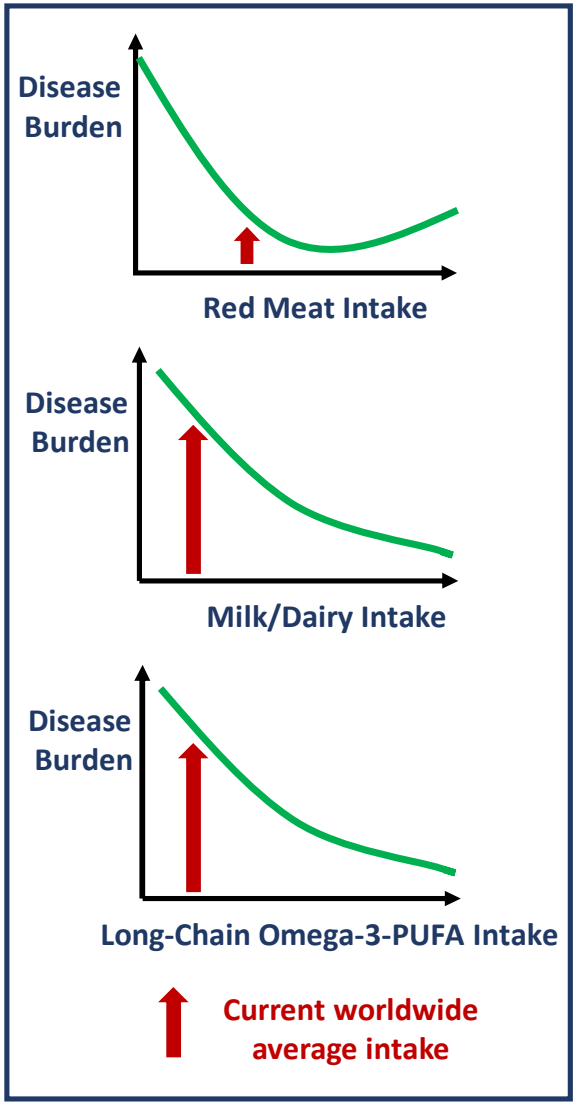
Gross Emissions	547 t/year
Gross Sequestration	665 t/year
Net Emissions	**-118 t/year**



Will the meat market reductions and advertisement prohibitions impact on uptake of improved production practices?

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.
- 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.
- The overall ambition of the World Wildlife Fund (WWF) Basket Initiative, the halving of the environmental impact of UK supermarket baskets by 2030, is highly laudable.
- However, achieving a 50/50 plant/animal protein sales split would very likely result in substantial nutritional deficiencies - women, children, the elderly and those of low income will be particularly adversely impacted.
- If meat, fish, dairy and egg protein is replaced by ultra-processed plant-based meat and dairy alternatives, there is considerable risk that deaths and ill-health from diabetes, heart attacks, strokes and cancers will increase.



RCSI UNIVERSITY OF MEDICINE AND HEALTH SCIENCES

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HEALTH — NOVEMBER 12, 2022

Red meat is not a health risk. New study slams years of shoddy research

Years of shoddy research have overstated the risk.

The IHME scientists had been observing the shoddy nature of health science for decades.

Each year, hundreds of frankly lazy studies are published that simply attempt to find an observational link between some action — eating a food for example —and a health outcome, like death or disease. In the end, owing to sloppy methods, varying subject populations, and inconsistent statistical measures, everything, especially different foods, seems to be both associated and not associated with cancer.

How is the lay public supposed to interpret this mess?.

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

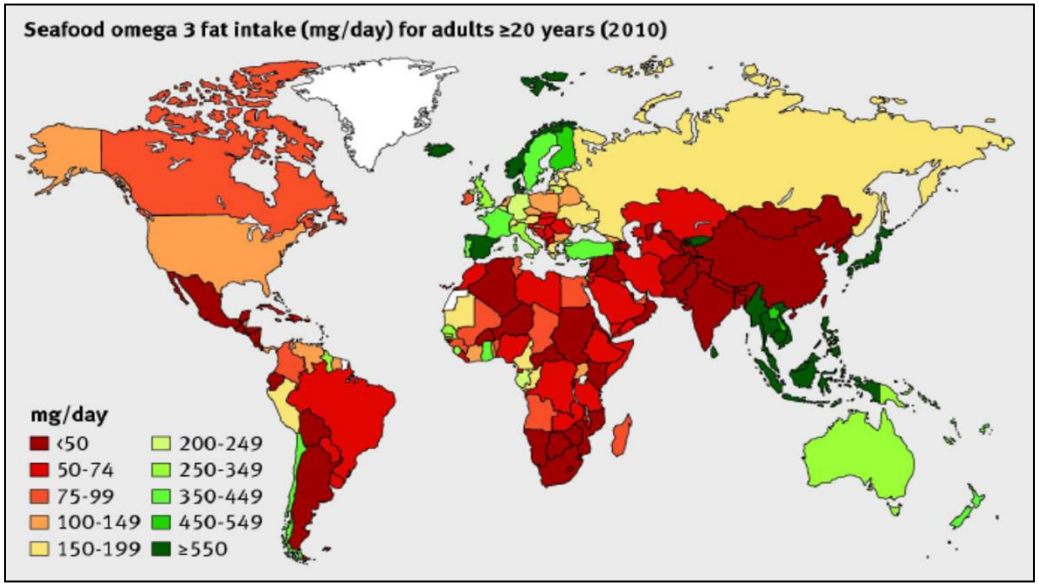
During Infancy & Childhood, Omega-3-PUFAs are Important for;

- 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.

An Alternative Solution
Chicken-meat and Eggs Naturally Enriched with Algae-Sourced Omega-3 PUFAs

SCIENTIFIC REPORTS
nature research
Check for updates

Omega-3 index and blood pressure responses to eating foods naturally enriched with omega-3 polyunsaturated fatty acids: a randomized controlled trial

Alice V. Stanton[1,2,3✉], Kirstyn James[1,2], Margaret M. Brennan[1], Fiona O'Donovan[1,3], Fahad Buskandar[1], Kathleen Shortall[1], Thora El-Sayed[1], Jean Kennedy[3], Heather Hayes[3], Alan G. Fahey[4], Niall Pender[1,2,5], Simon A. M. Thom[6], Niamh Moran[1], David J. Williams[1,2] & Eamon Dolan[1,7]