Food and Agriculture Organization of the United Nations

Dairy development in low and middle-income countries

What evidence does the data holds?

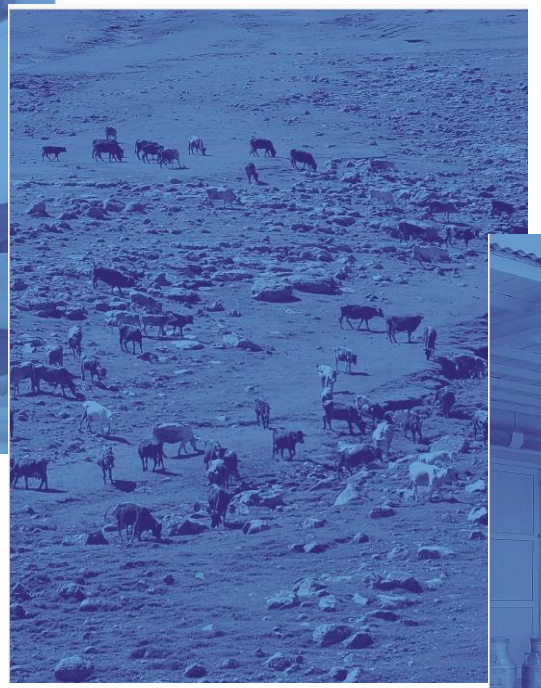
Ugo Pica-Ciamarra (FAO)

Local Investment for Global Good: Building Dairy Value Chain

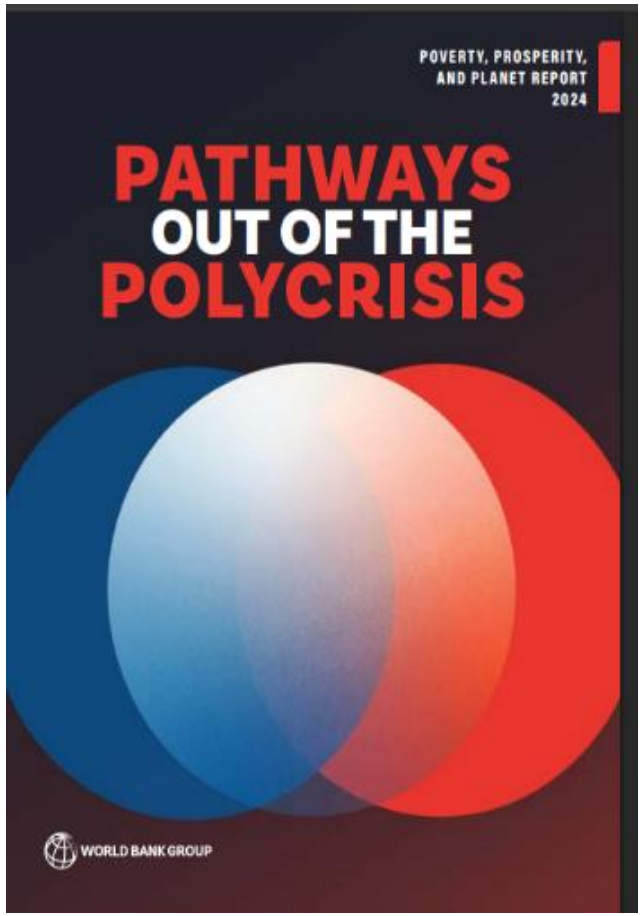
A Nutrition for Growth Official Side Event – Paris, 26 March 2025

Outline

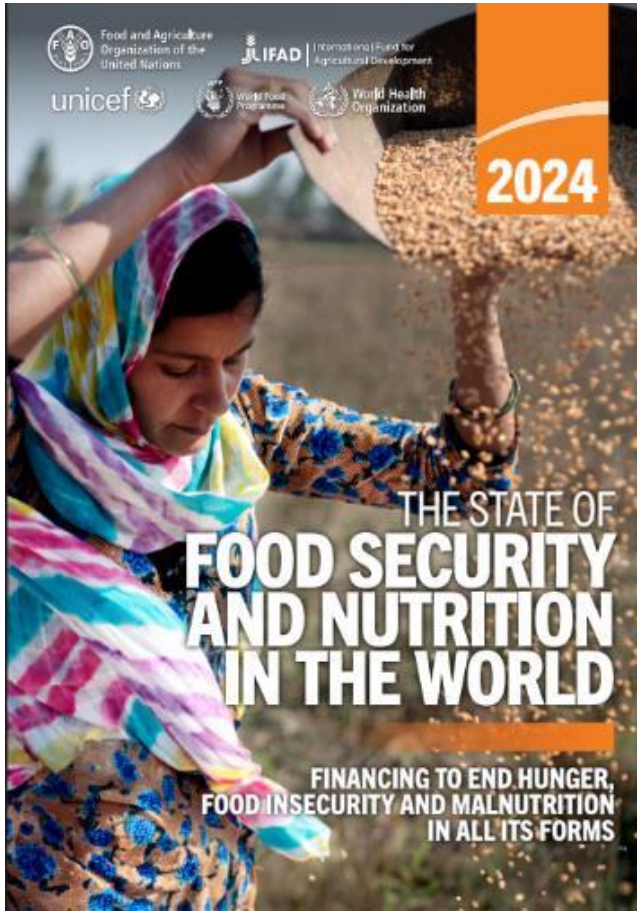
- Facts and one question
- Scattered evidence
- Data and method
- Findings
- Conclusions



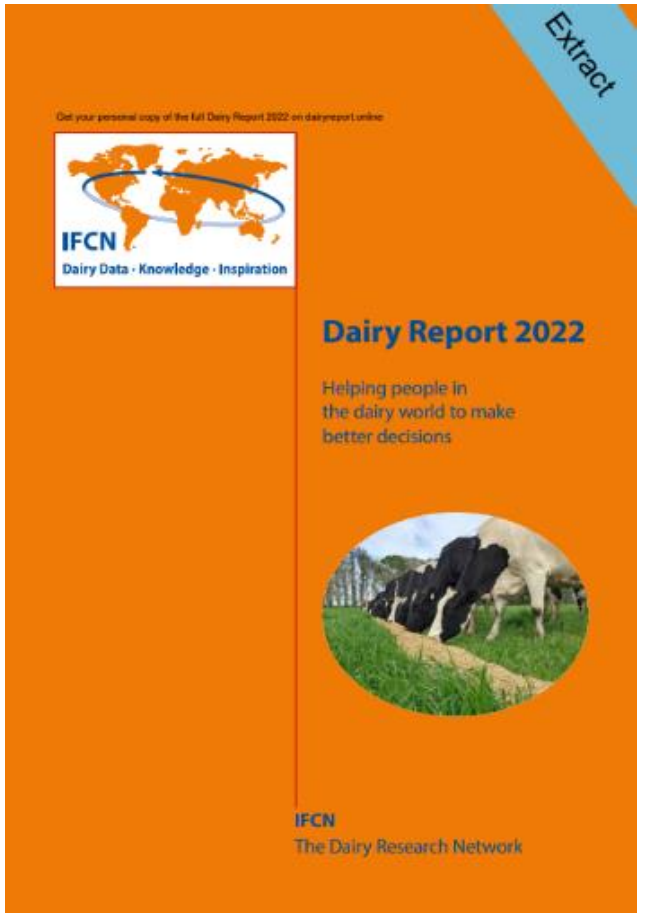
Facts



692 million extreme poor



713-757 million face hunger



120 million dairy farmers

Question

SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

4 QUALITY EDUCATION

5 GENDER EQUALITY

8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES

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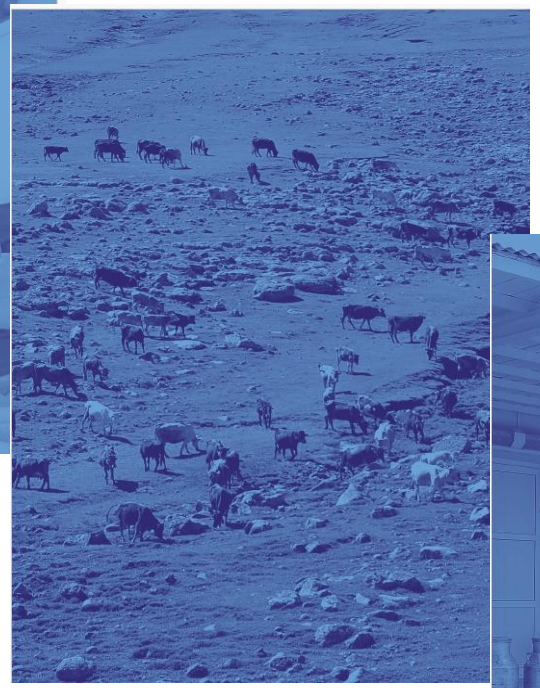

Scattered evidence

SUSTAINABLE DEVELOPMENT GOALS

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Robust scattered evidence?

Increasing milk yield is beneficial for women since they manage dairy animals …

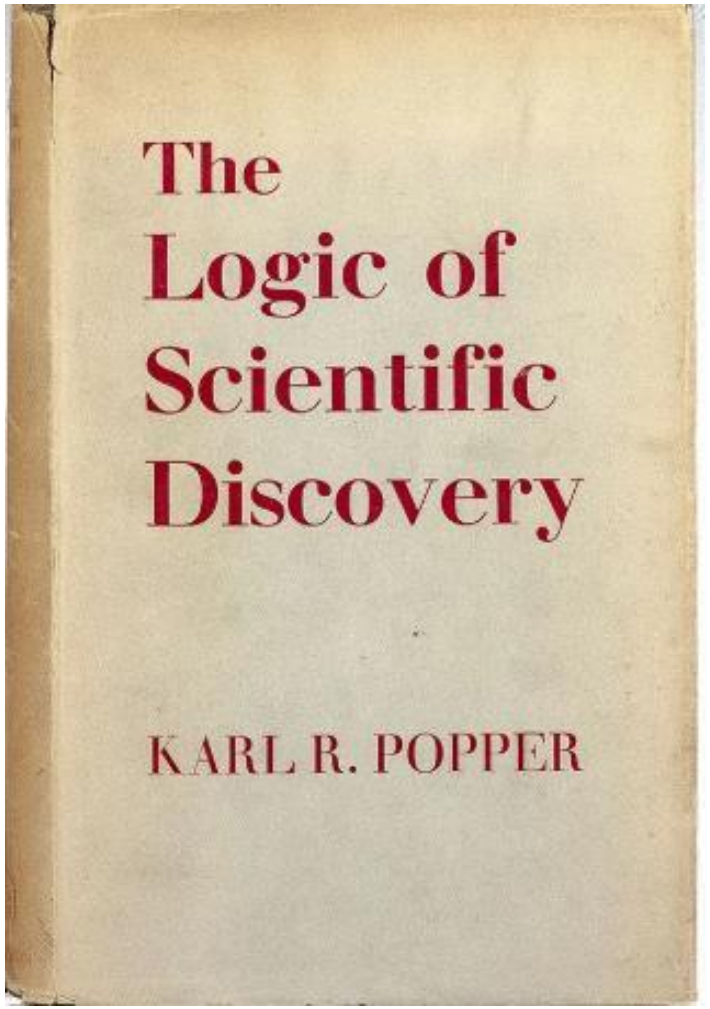
… but can this lead to men taking over the management, shifting the power dynamics?

Children in dairy-keeping households are better nourished …

… but might they miss school to help care for the animals?

Milk School Programs improve educational outcomes…

… but may households reduce their intake of nutrient-rich foods at home as a result?



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© Daily Mail

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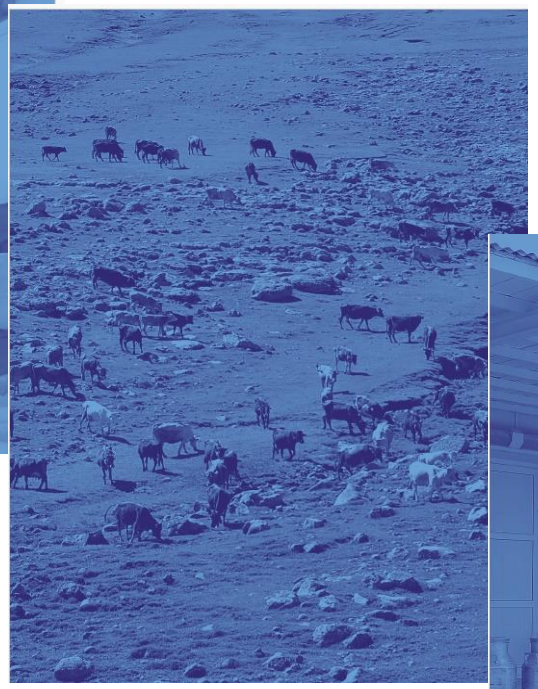
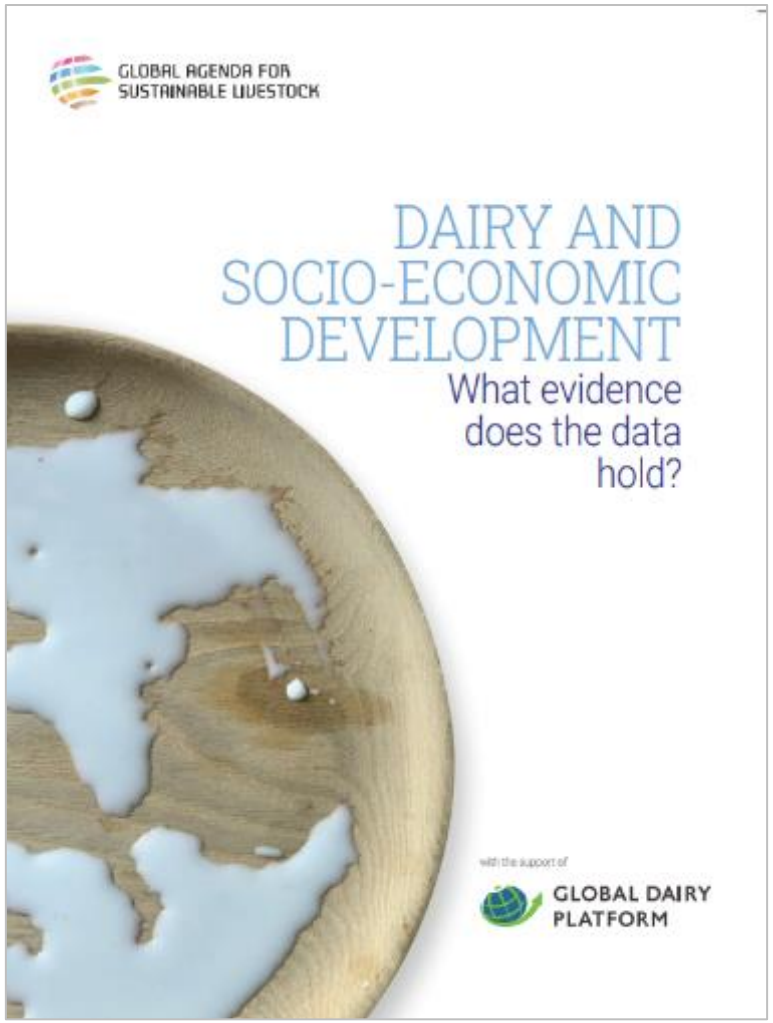


Let the data speak: insights from > 37,000 observations

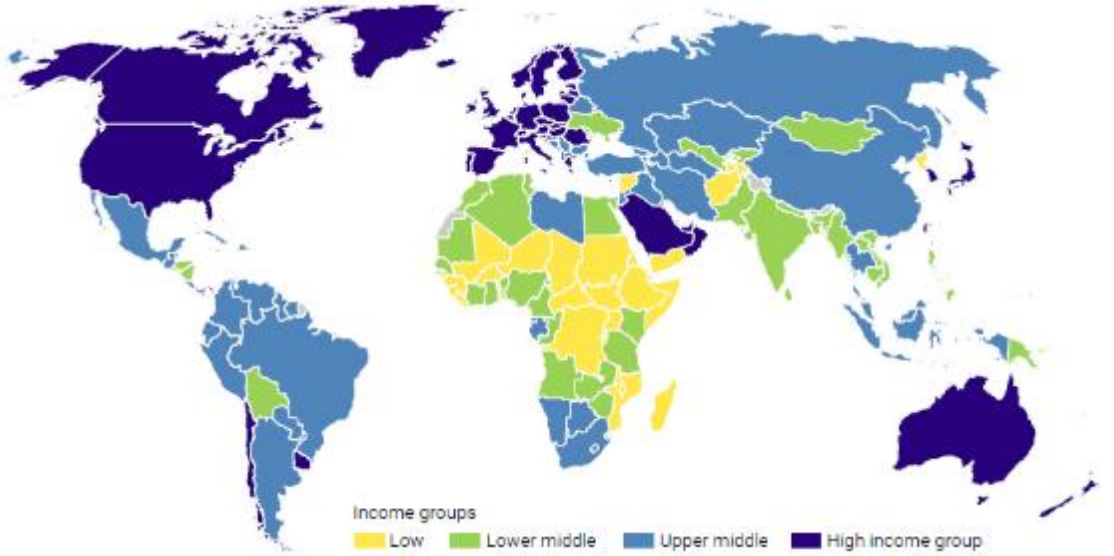


187 countries – 97 variables – 24 indicators

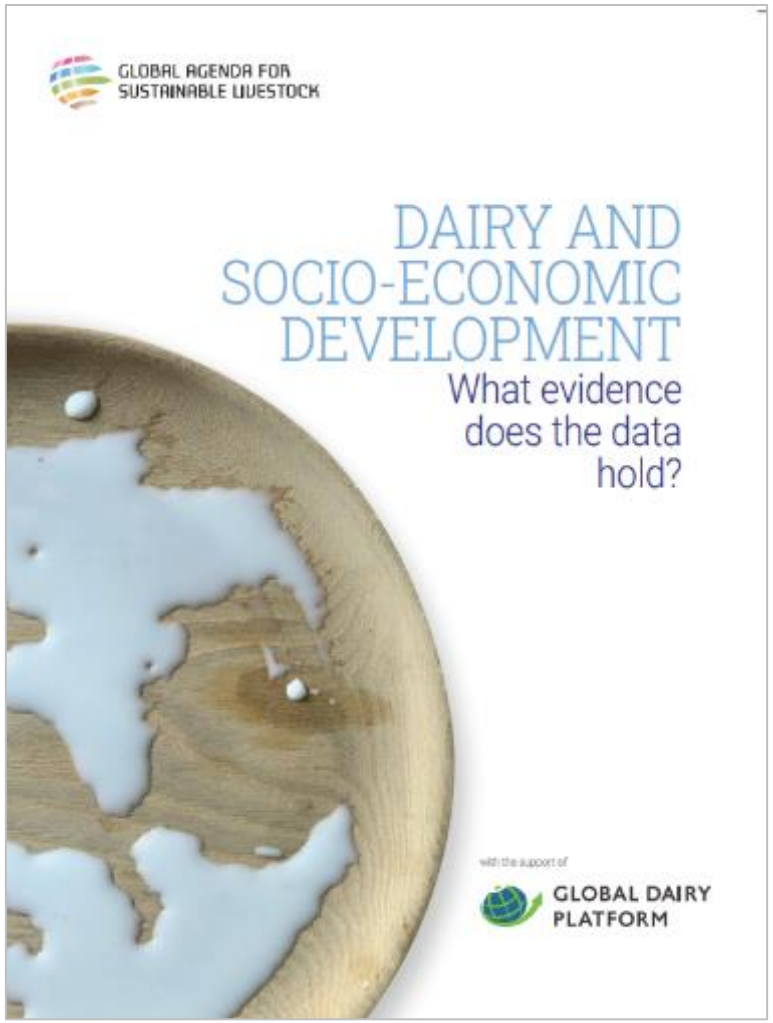
- Dairy sector

- Livelihoods
- Employment
- Consumption
- Government

Countries by income group



Let the data speak: insights from > 37,000 observations



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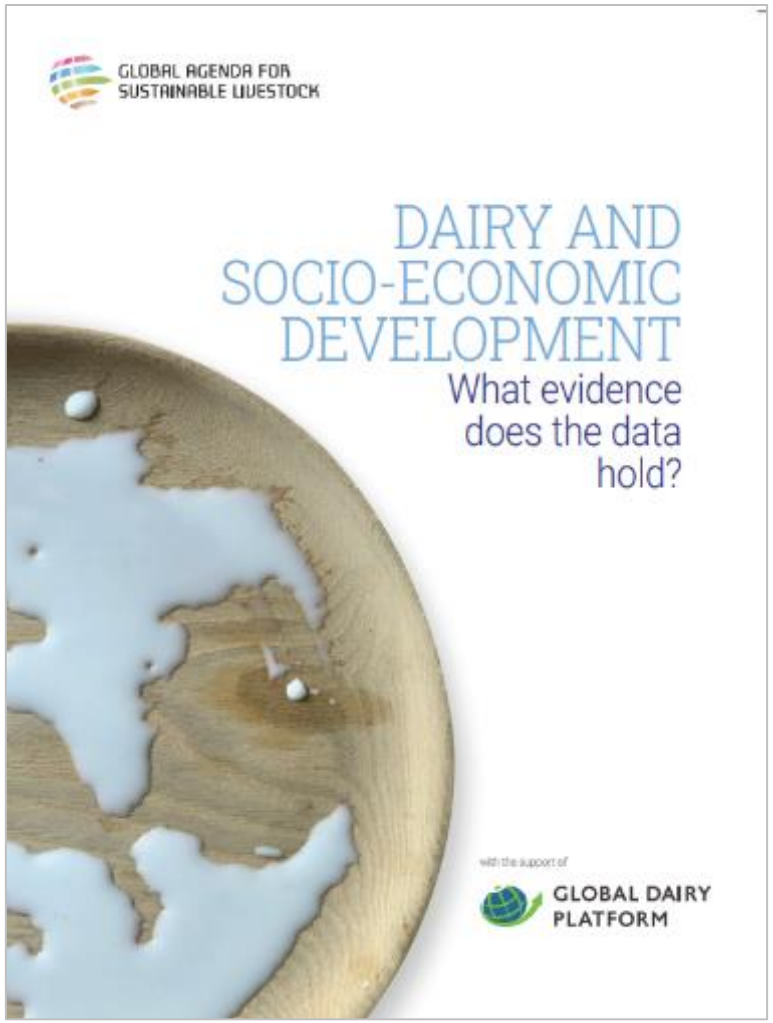
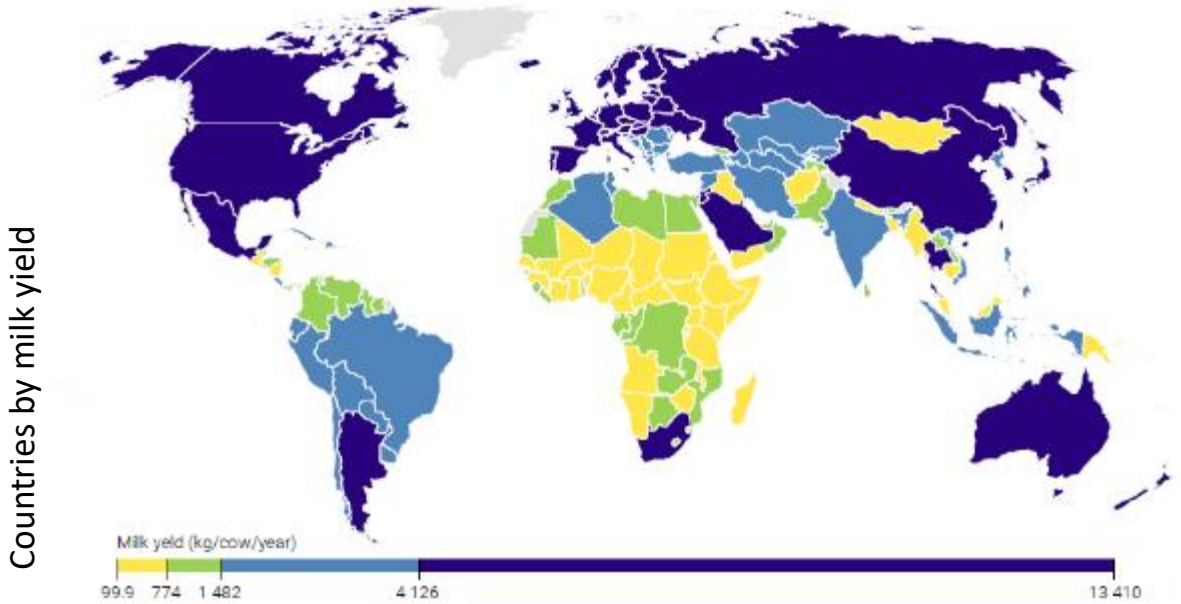


187 countries – 97 variables – 24 indicators

- Milk yield
  - Low (376 kg/cow/year)
  - Lower-middle (2,239 kg/cow/year)
  - Upper middle (2,574 kg/cow/year)
  - High (7,106 kg/cow/year)



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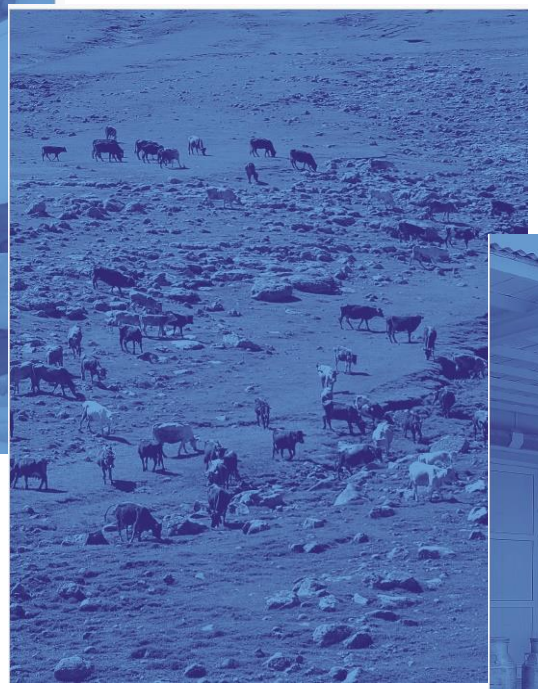
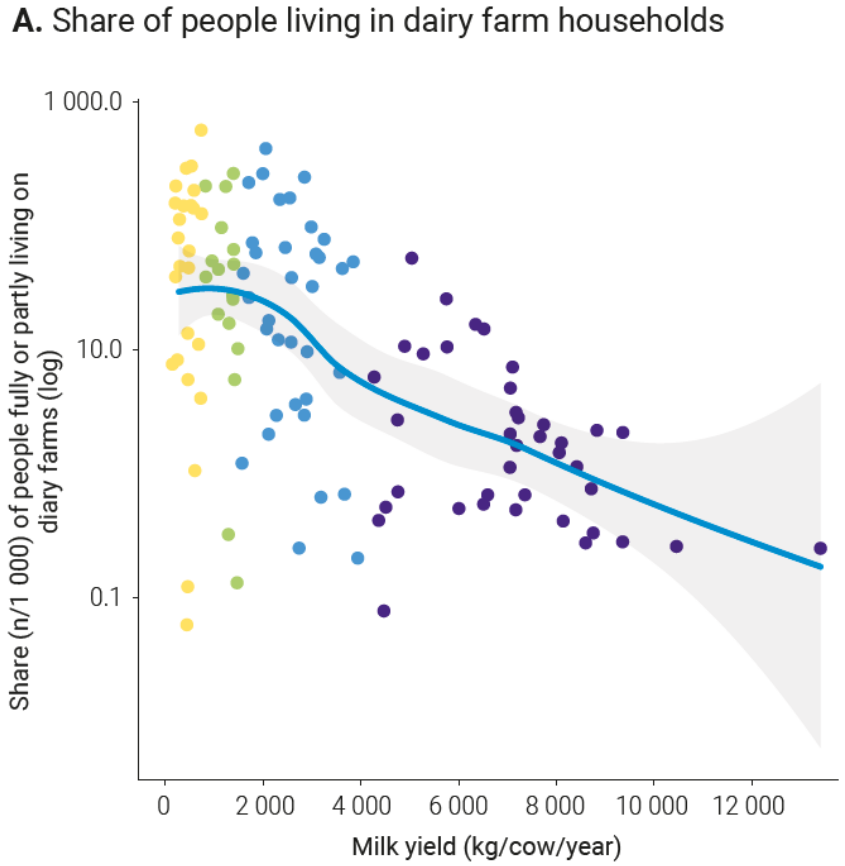
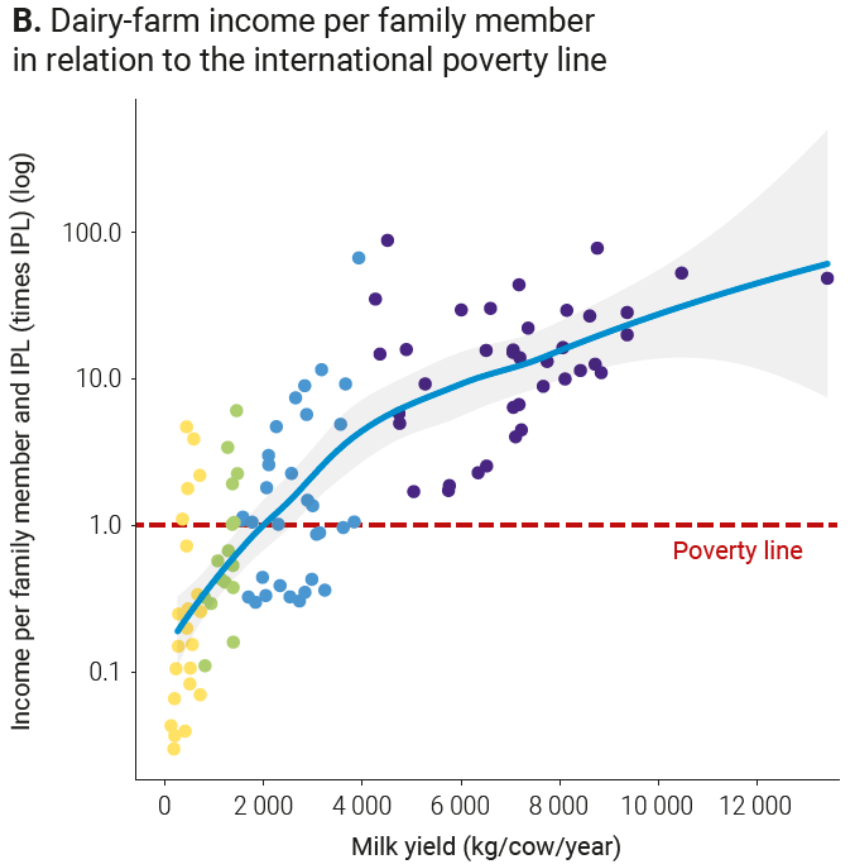


Findings: dairy farmers and livelihoods

As the dairy sector transforms and develops …

… less and less people are directly engaged in milk production





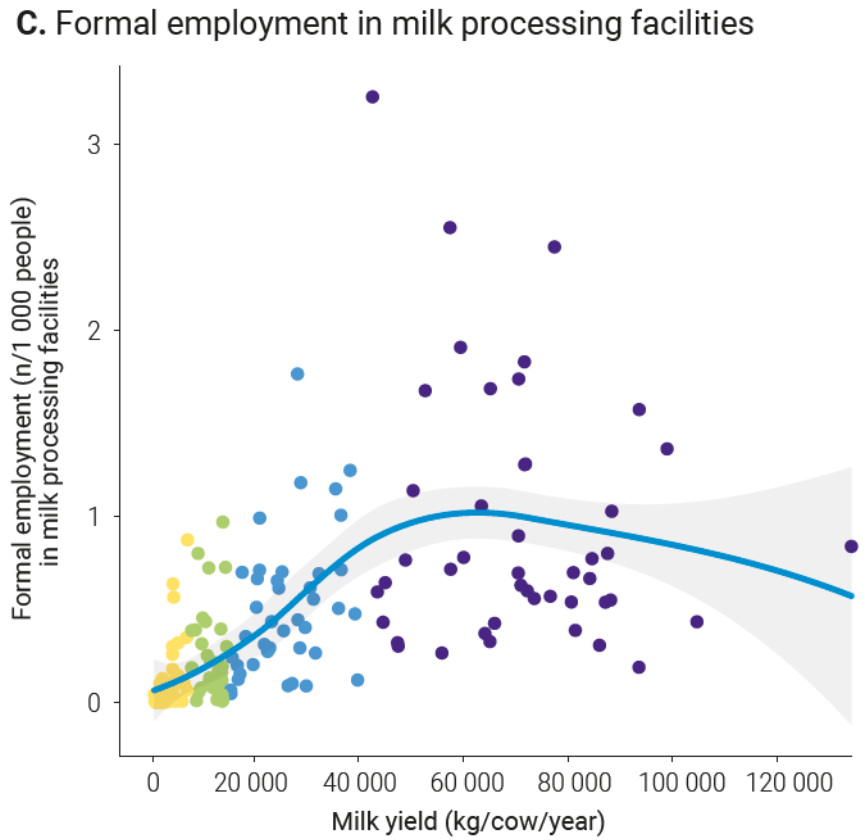
Low · Lower middle · Upper middle · High milk yield

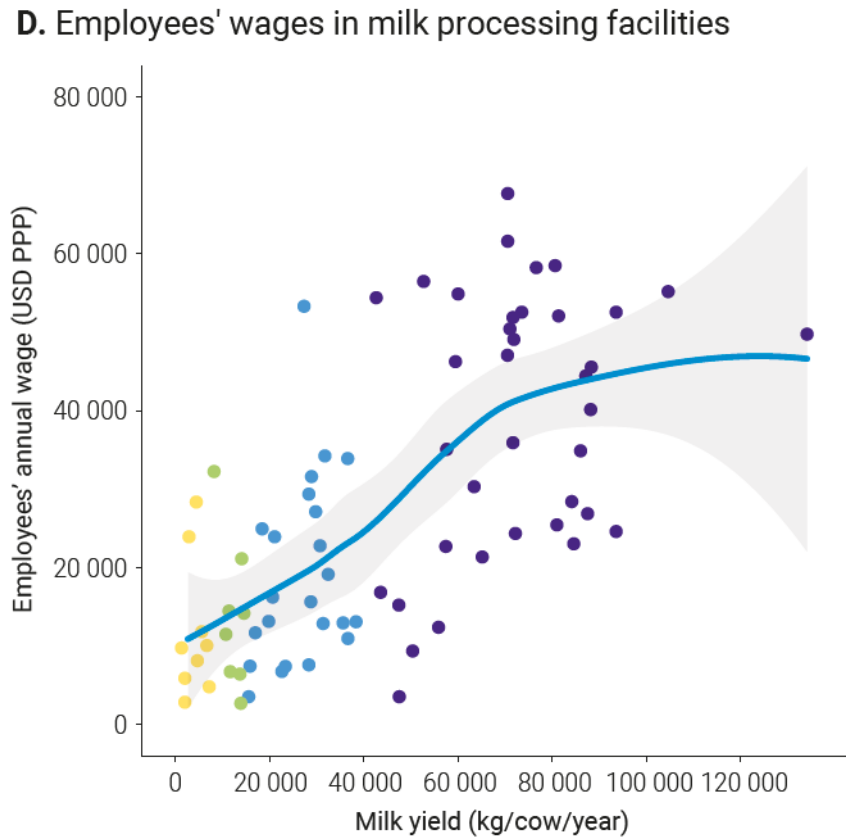
… dairy farmers are increasingly better off

Findings: employment in the dairy sector

As the dairy sector transforms and develops …

… more and more people find employment in processing





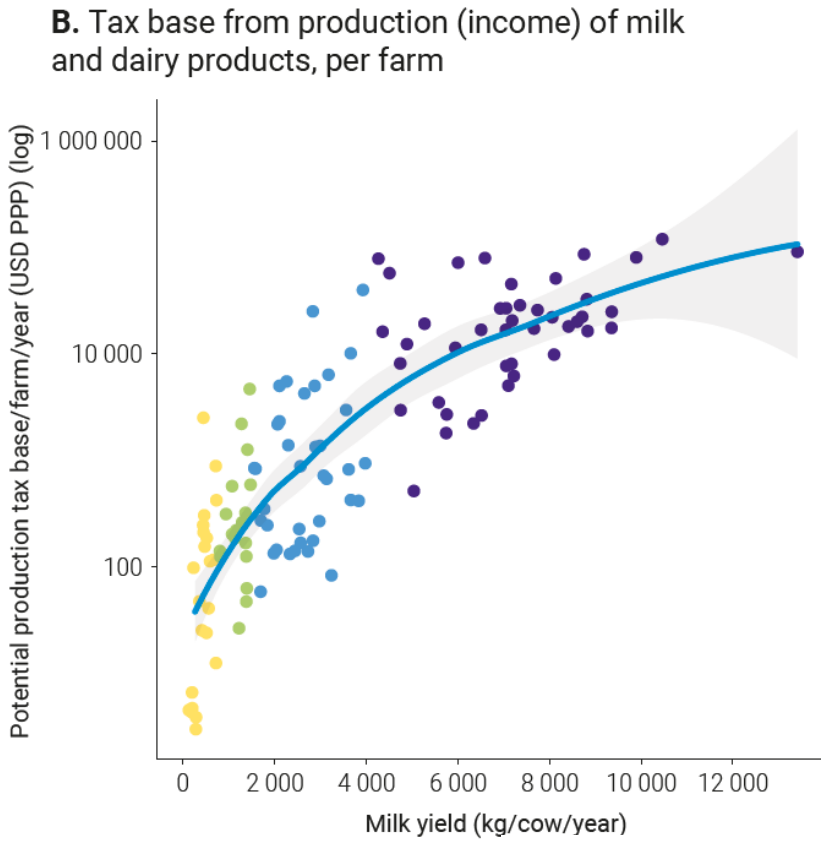
… employees are increasingly better off

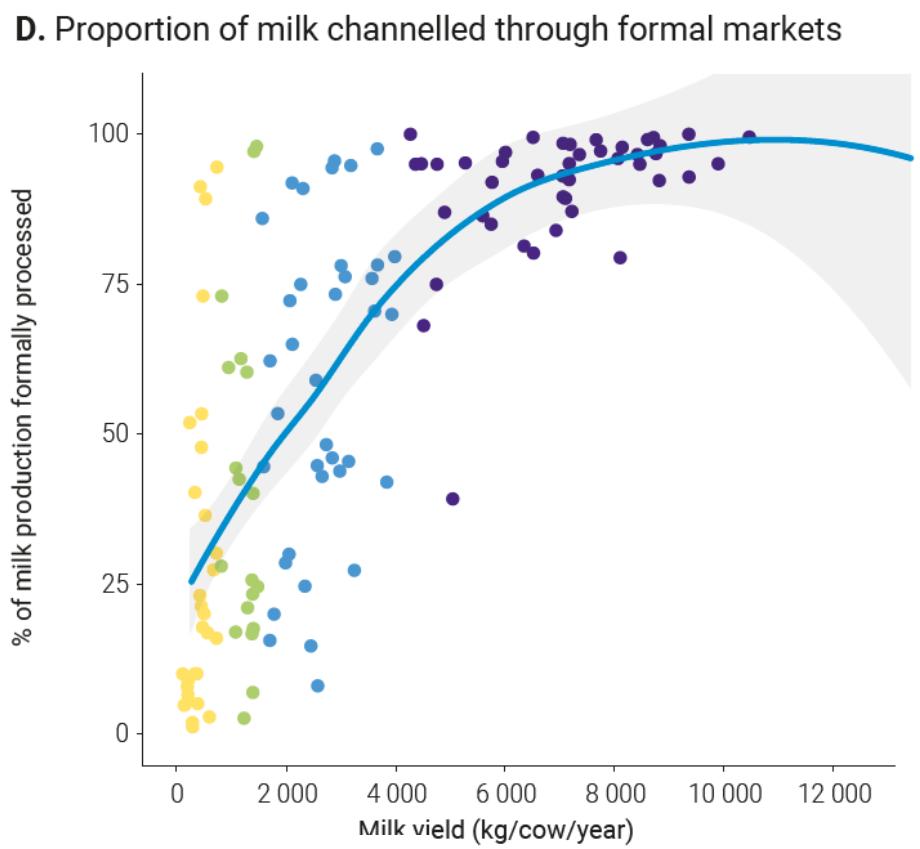
Low · Lower middle · Upper middle · High milk yield

Dairy sector and government revenue generation

As the dairy sector transforms and develops …

… potential tax revenue from production increases





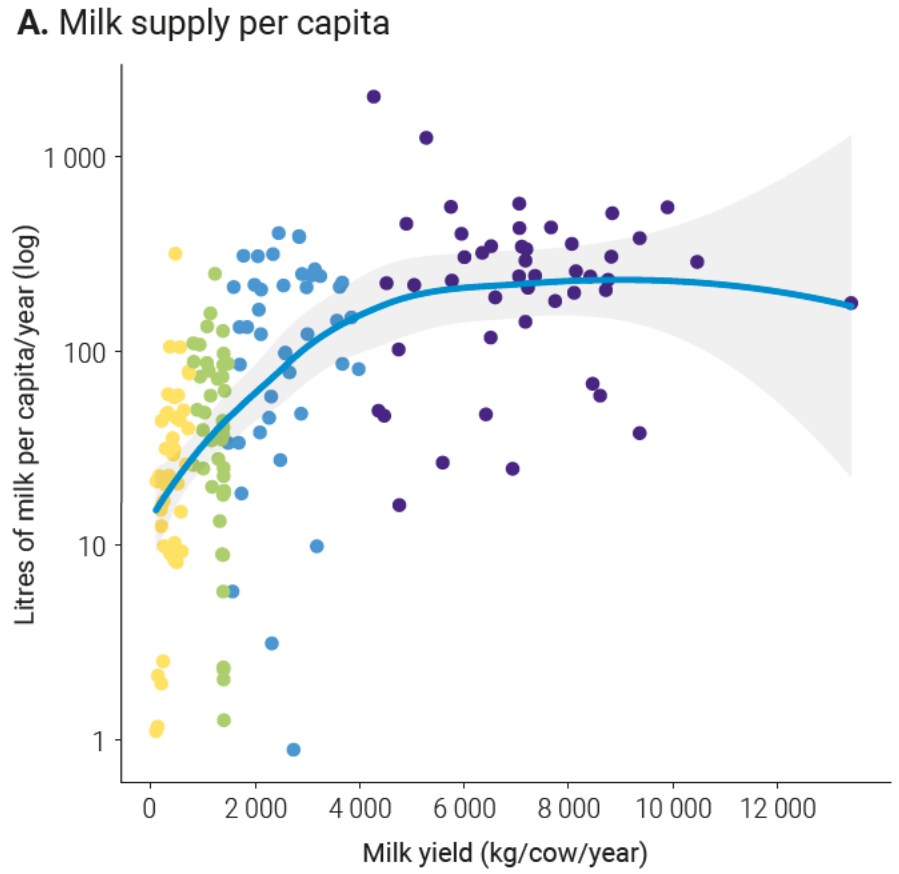
Low · Lower middle · Upper middle · High milk yield

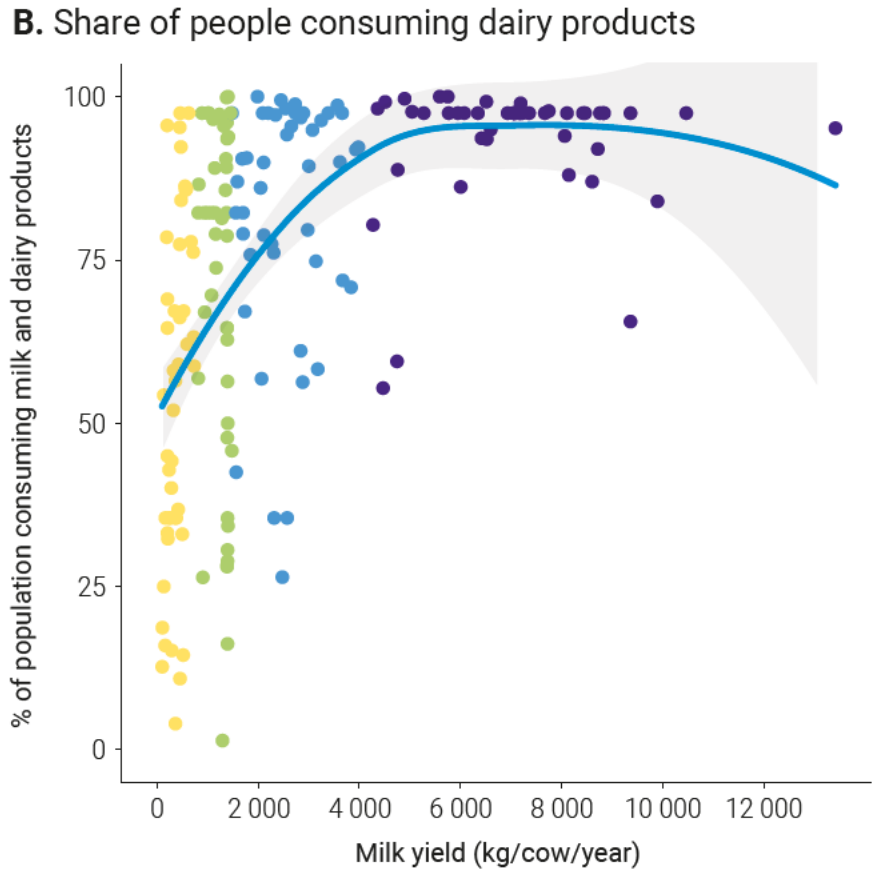
… potential tax revenue from consumption increases

Dairy sector and food security

As the dairy sector transforms and develops …

… per capita availability of milk increases





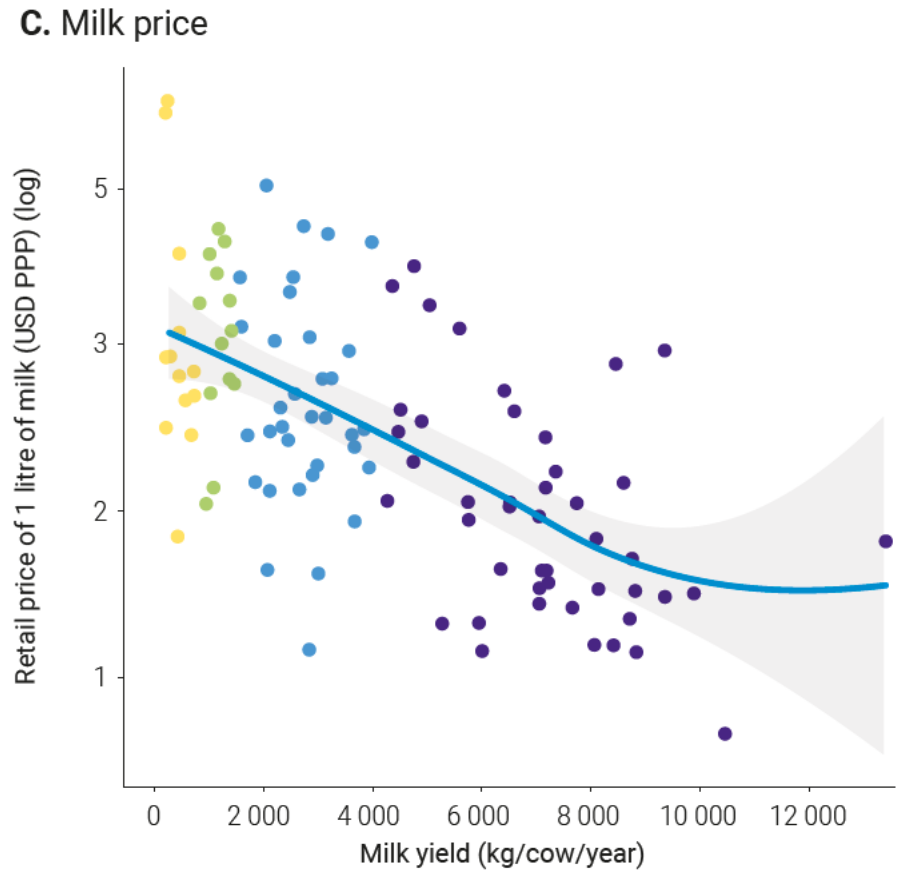
… share of population consuming dairy products increases

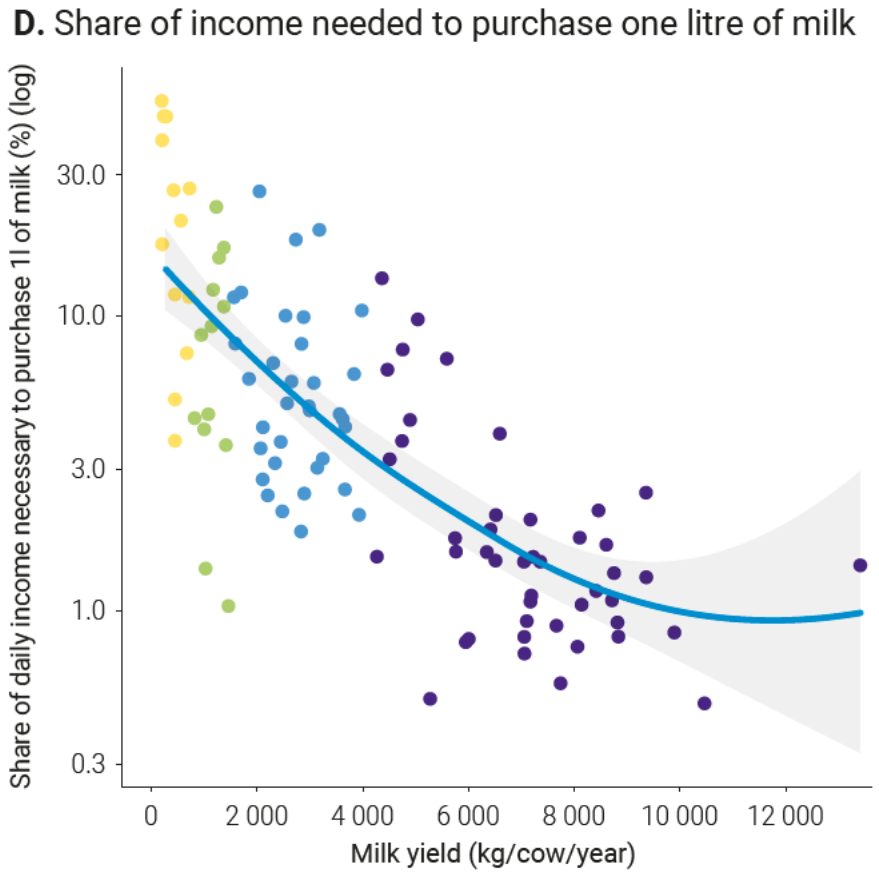
Low · Lower middle · Upper middle · High milk yield

Dairy sector and food security

As the dairy sector transforms and develops …

… real milk price for consumers decreases





… share of income needed to purchase milk (1l) becomes negligible

Low · Lower middle · Upper middle · High milk yield

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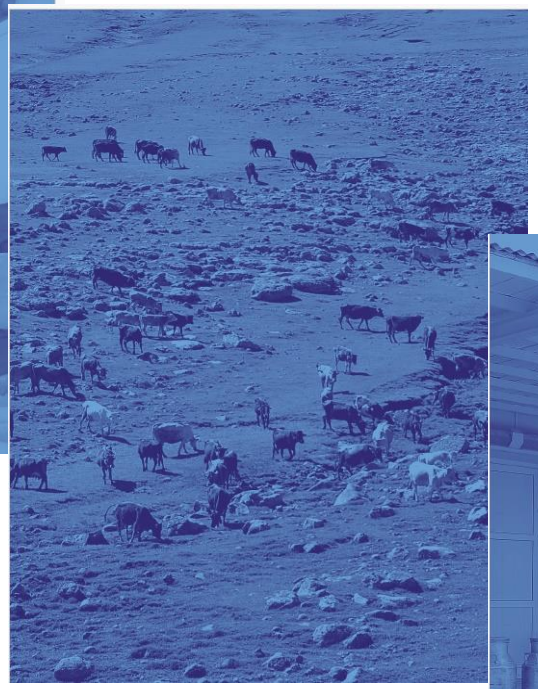


Conclusions

- The dairy sector directly sustains the livelihoods of over 110 million households in low- and middle-income countries

- As the dairy sector develops:
  - employment shifts from production to processing
  - government's tax base expands
  - benefits extend to the largest share of the population - consumers

Drawings: FAO/Chiara Caproni

The Role of Dairy in Nutritional Security

Alice V. Stanton
Royal College of Surgeons in Ireland,

Disclosures

Financial

- Previous part-time employee of Devenish Nutrition
- Currently owns stock in Devenish Nutrition,

Devenish Nutrition is an agri-technology company specialising in sustainable food solutions.

Non-remunerated member of;

- Irish 2030 Agri-Food Strategy Committee,
- Irish Climate and Health Coalition,
- Council on High Blood Pressure of the Irish Heart Foundation,
- World Action against Salt, Sugar, and Health,
- Meat Technology Ireland,
- Scientific Council of World Farmers Organisation.

Nutritional Security

Builds on food security

Means
consistent access, availability, and affordability
of foods and beverages that
promote well-being and prevent disease,
particularly among racial/ethnic minority populations,
lower income populations, and rural and remote populations.

USDA Food & Nutrition Service March 2022

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.

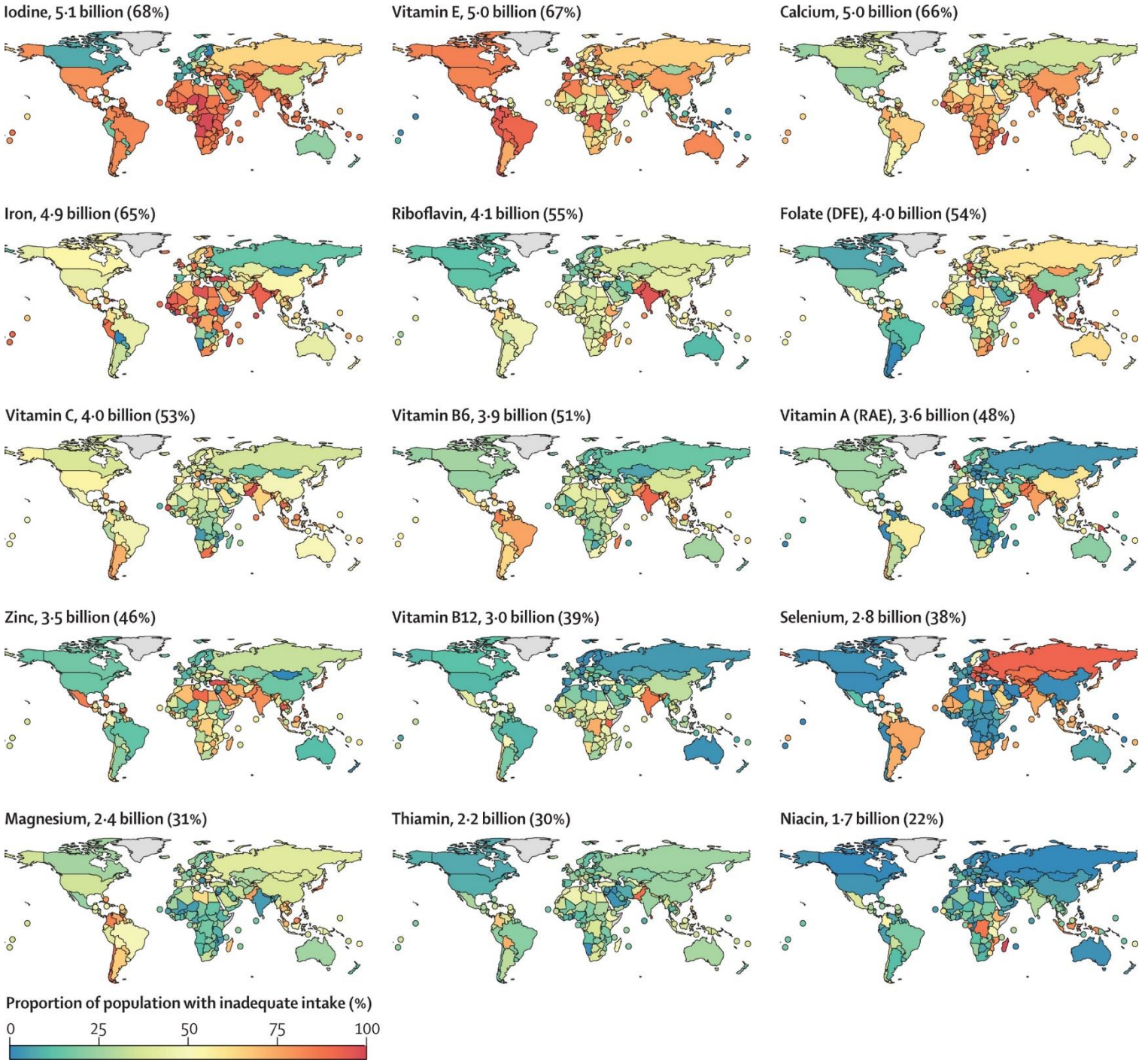
> 2 billion are
Overweight or **Obese**

820 million are
Chronically Undernourished

> 2 billion suffer from
Hidden Hunger

FAO, IFAD, UNICEF, WFP & WHO The state of Food Security and Nutrition in the World 2024

More than Half of the World's Population do not Consume Enough Iodine (68%) Vitamin E (67%), Calcium (66%), Iron (65%), Riboflavin (55%), Folate (54%), and Vitamin C (53%).



Passarelli S et al
Global estimation of dietary micronutrient inadequacies: a modelling analysis
The Lancet Global Health Sept 2024

Milk is an Excellent Source of Protein & Many Commonly Lacking Micronutrients.

MACRONUTRIENTS

Calories: 149 kcal

Carbohydrates: 11.5 g (4%)
- Fiber: 0 g
- Sugars: 11.5 g

Fat: 7.97 g (10%)
- Saturated: 4.54 g (23%)
- Monounsaturated: 1.98 g
- Polyunsaturated: 0.48 g
- Omega-3: 0.18 g
- Omega-6: 0.29 g

Protein: 7.69 g (15%)

VITAMINS

Vitamin B12: (56%)

Riboflavin (B2): (26%)

Pantothenic acid (B5): (18%)

Thiamin (B1): (12%)

Vitamin D: (12%)

Vitamin B6: (9%)

Vitamin A, RAE: (9%)

Choline: (8%)

Niacin (B3): (2%)

Vitamin E: (1%)

MINERALS

Iodine: (63%)

Calcium: (24%)

Phosphorus: (20%)

Zinc: (10%)

Selenium: (9%)

Potassium: (8%)

Magnesium: (7%)

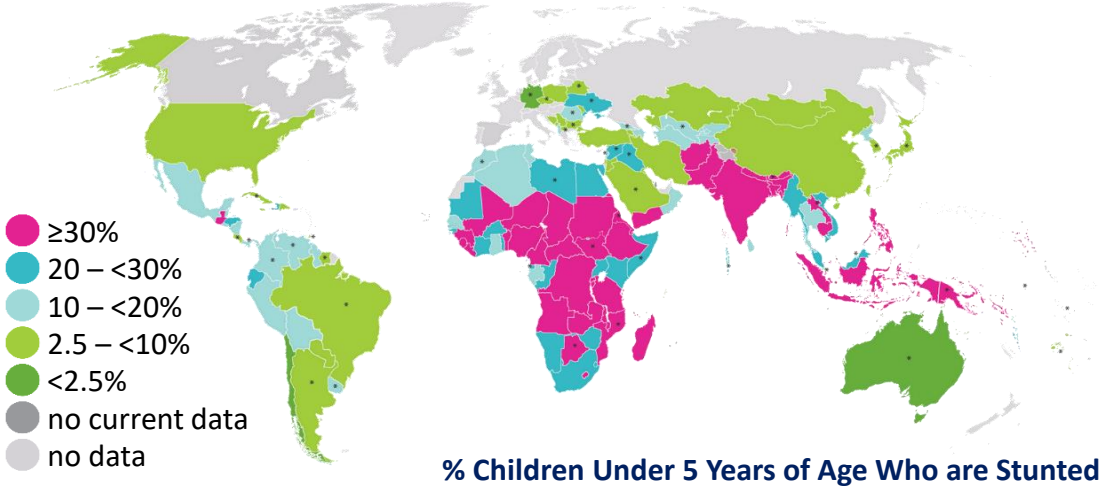
Sodium: (4%)

Copper: (<1%)

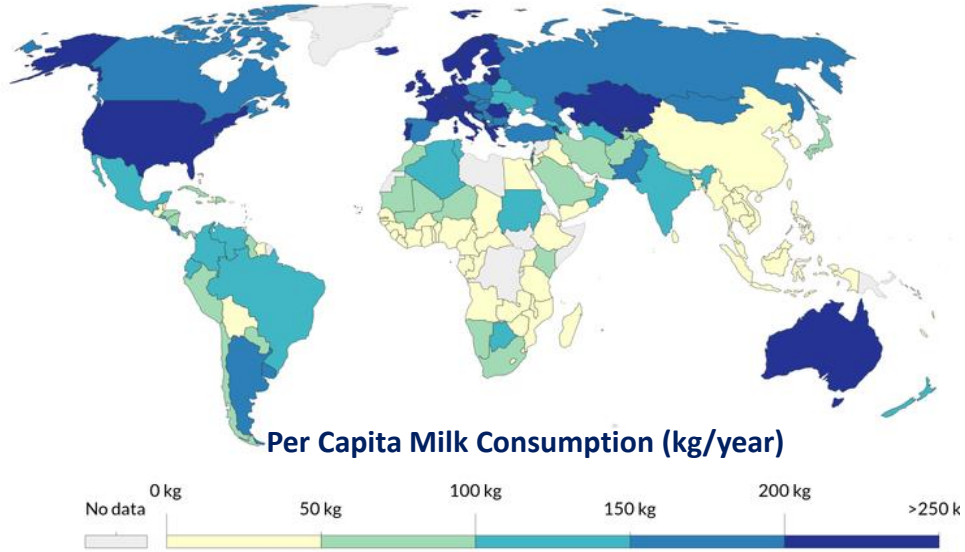
Nutritional values per 249 gram cup serving of whole milk (3.25% milkfat).
% daily values (%DV) calculated using USDA data and the FDA's published daily values

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

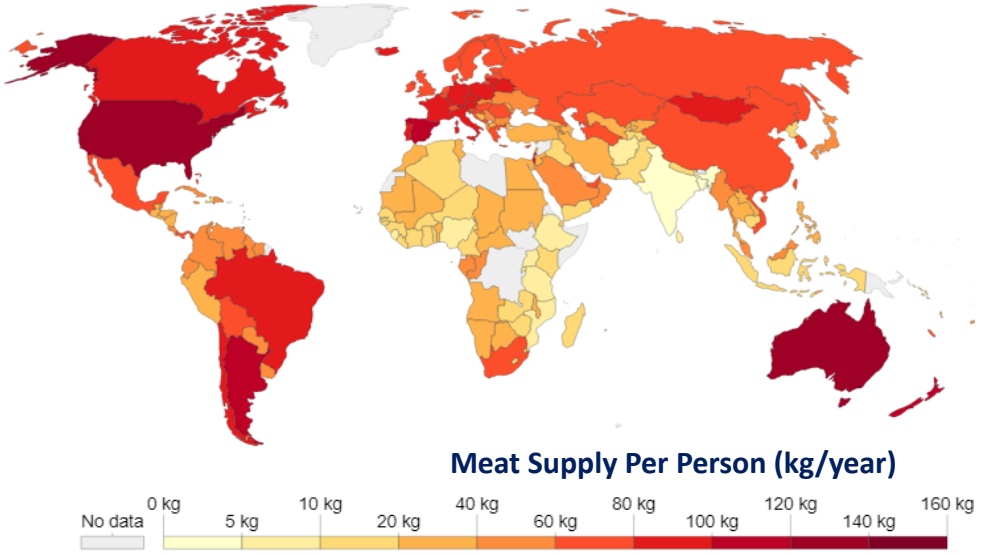
UNICEF, WHO, World Bank Joint Child Malnutrition dataset, March 2019 edition
UN Food and Agriculture Organization (FAO) 2017



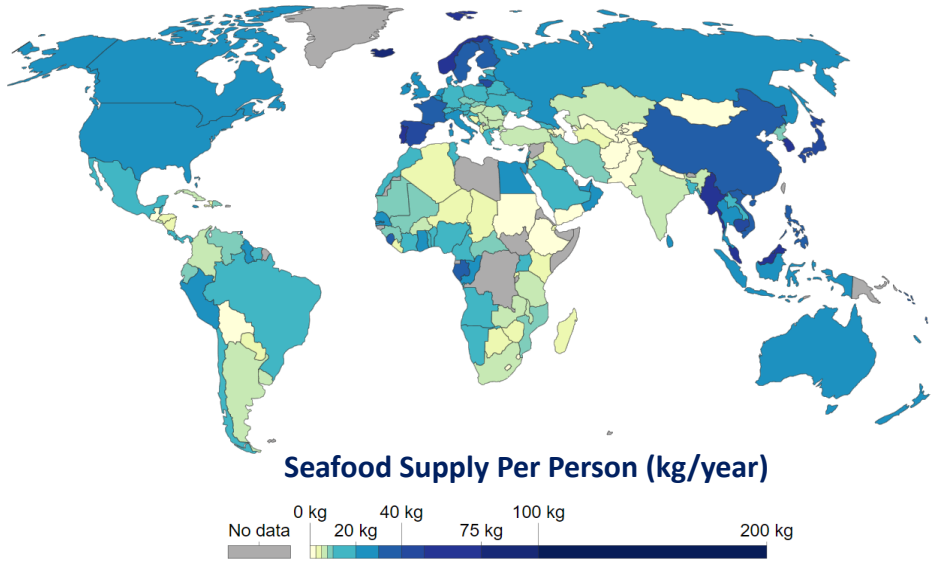
% Children Under 5 Years of Age Who are Stunted



Per Capita Milk Consumption (kg/year)



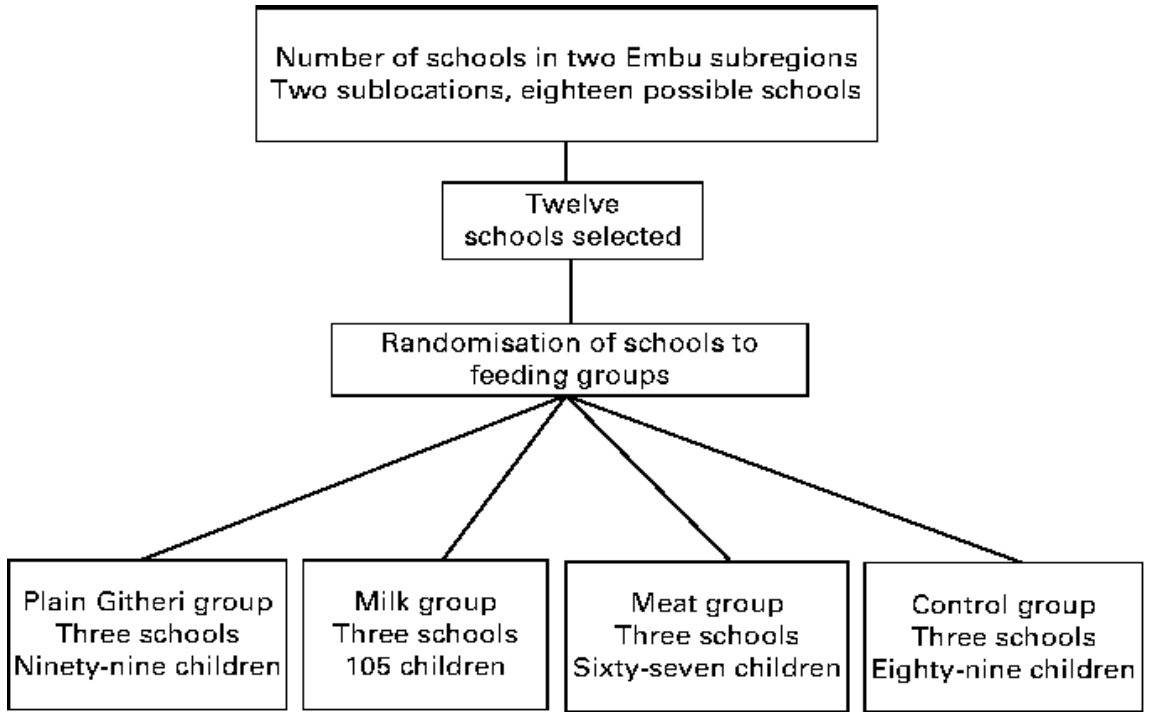
Meat Supply Per Person (kg/year)



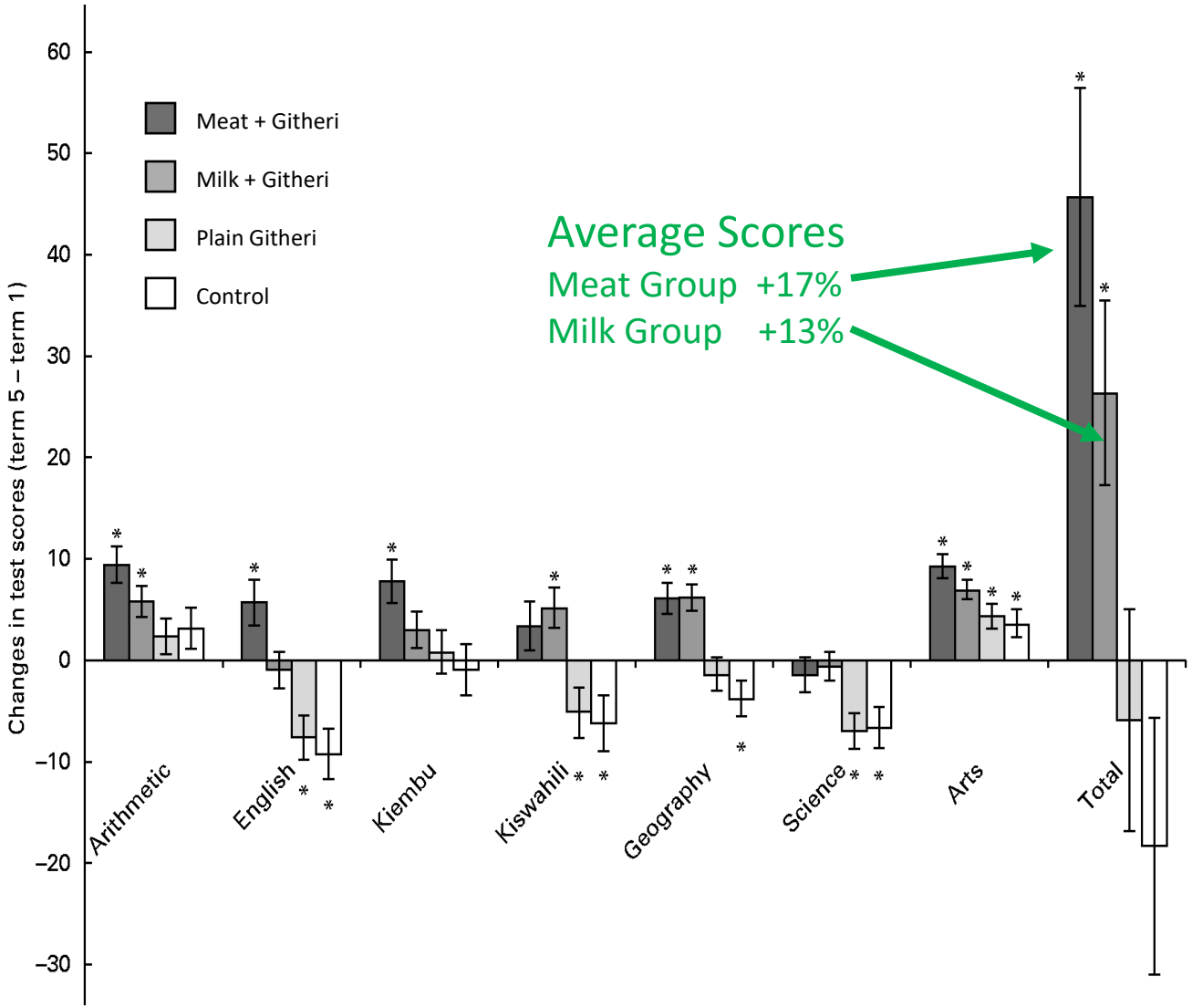
Seafood Supply Per Person (kg/year)

Animal Source Foods Impact Positively on Primary School Test Scores

- a cluster randomised, controlled feeding intervention trial in Kenya.



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. Brit J Nutrition 2014

Low Intake of Animal-Source Foods Also Shown to be Non-Optimal for Longevity

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

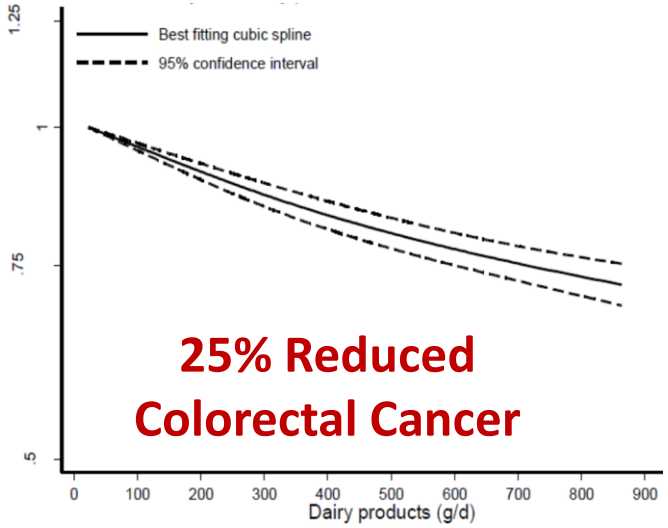
Research Report

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,†]

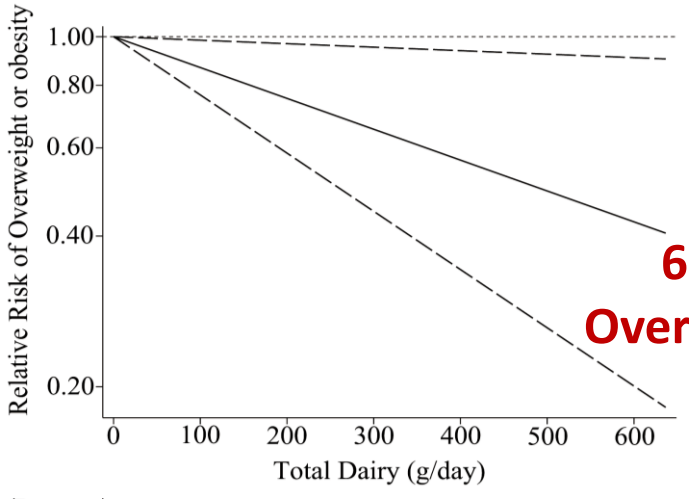
Two or more Full-Fat Dairy Servings/Day Associated With:

Relative Risk of Colorectal Cancer



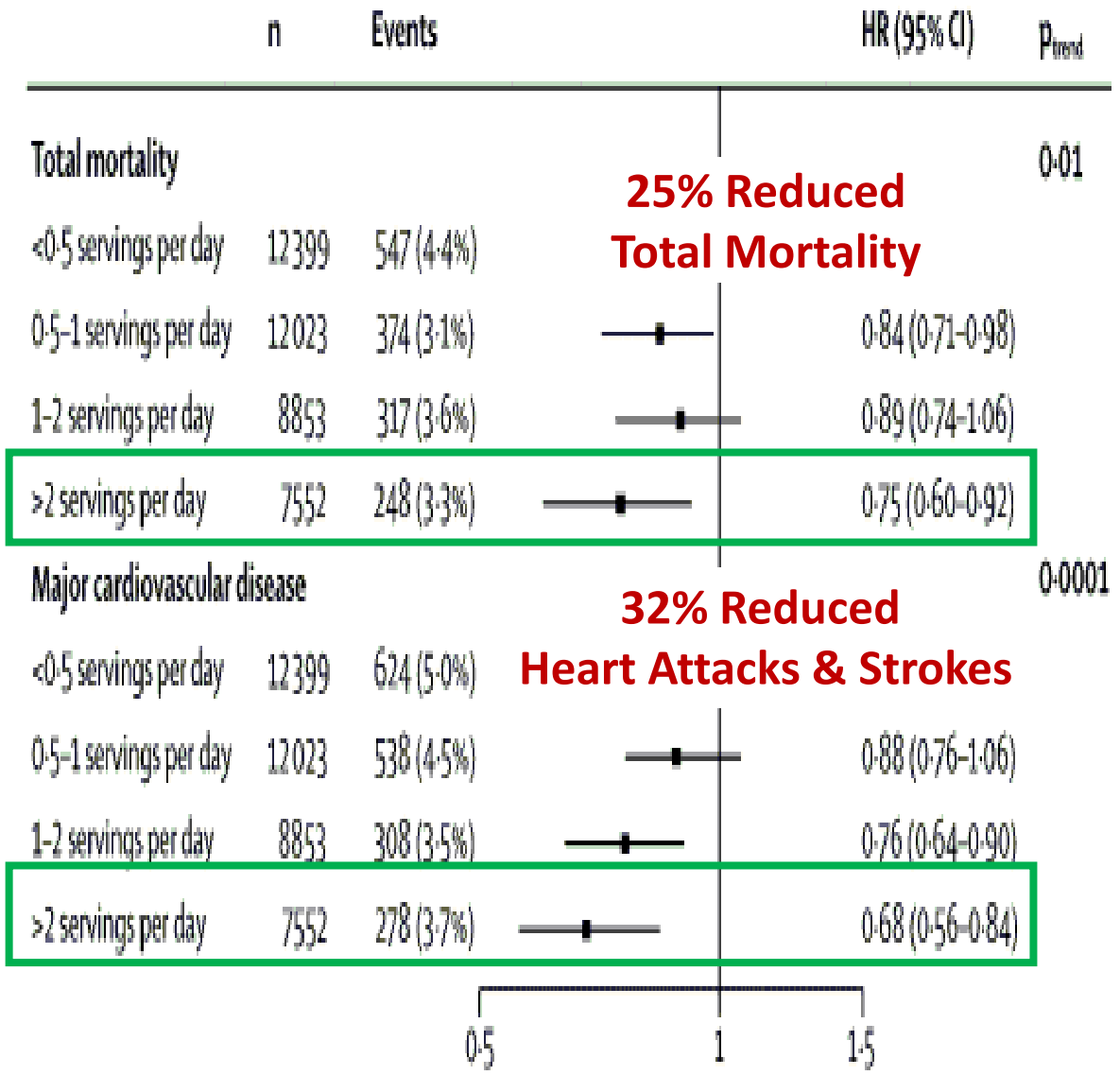
25% Reduced Colorectal Cancer

World Cancer Research Fund/ American Institute for Cancer Research. Continuous Update Project Expert Report 2018.



60% Reduced Overweight/Obesity

Feng et al, Adv Nutr 2022; 13 (6): 2165–2179.



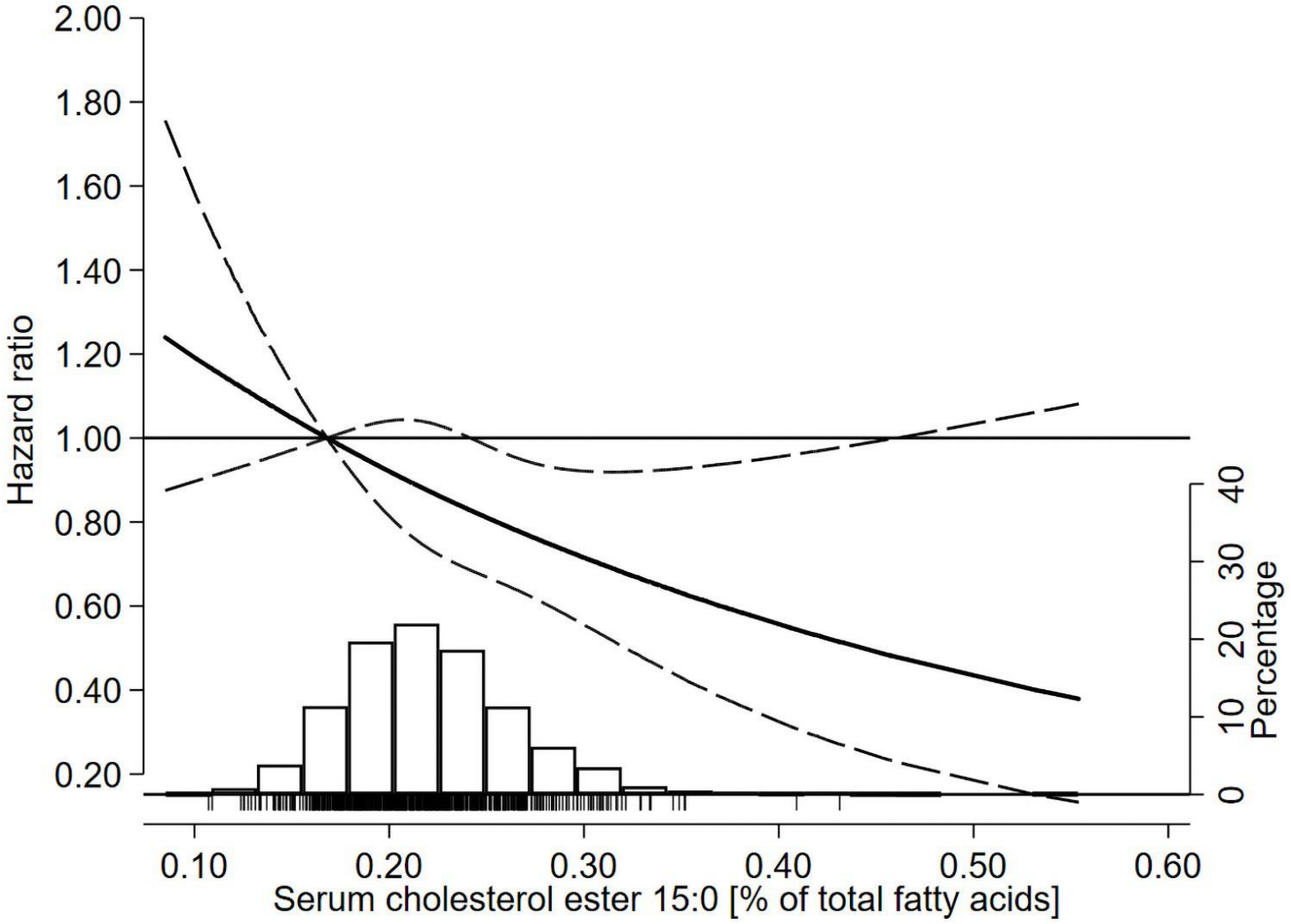
25% Reduced Total Mortality

32% Reduced Heart Attacks & Strokes

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

Cardiovascular Disease Events & All Cause Mortality Lowest in those with the Highest Levels of Serum Pentadecanoic Acid

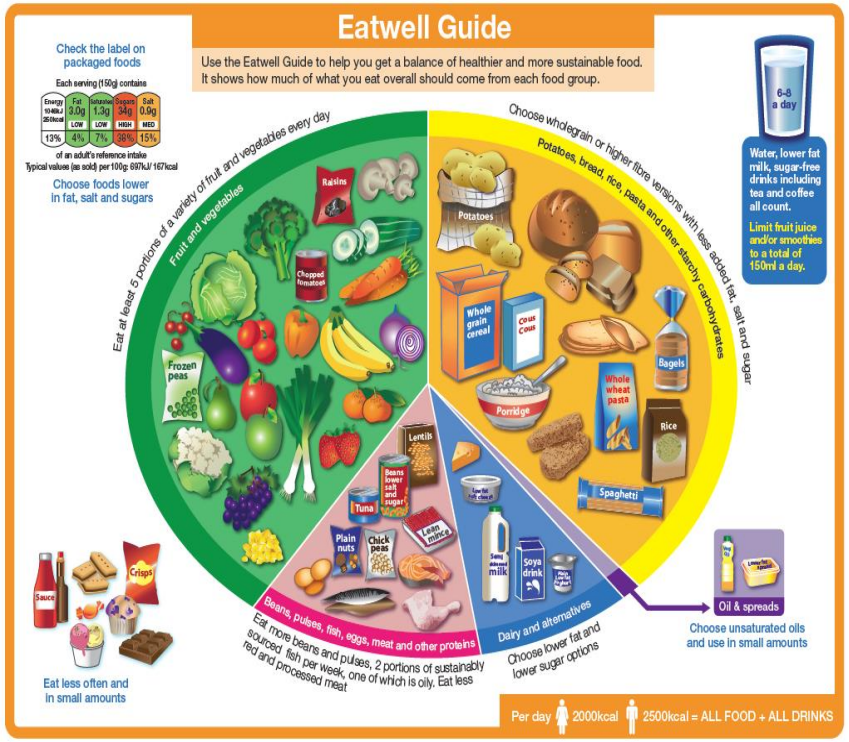
Serum Pentadecanoic Acid
is a
Biomarker of
Dairy Fat Intake



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.

Climate & Biodiversity Crises Both Pose Potentially Catastrophic Threats to Human Health

One Proposed Solution = Plant-Based Diets



EAT-Lancet Planetary Health Reference Diet

- Doubling Intakes of Fruits, Vegetables, Legumes, Nuts & Seeds
- Halving of Animal Sourced Foods (25% to 13% of Plate)

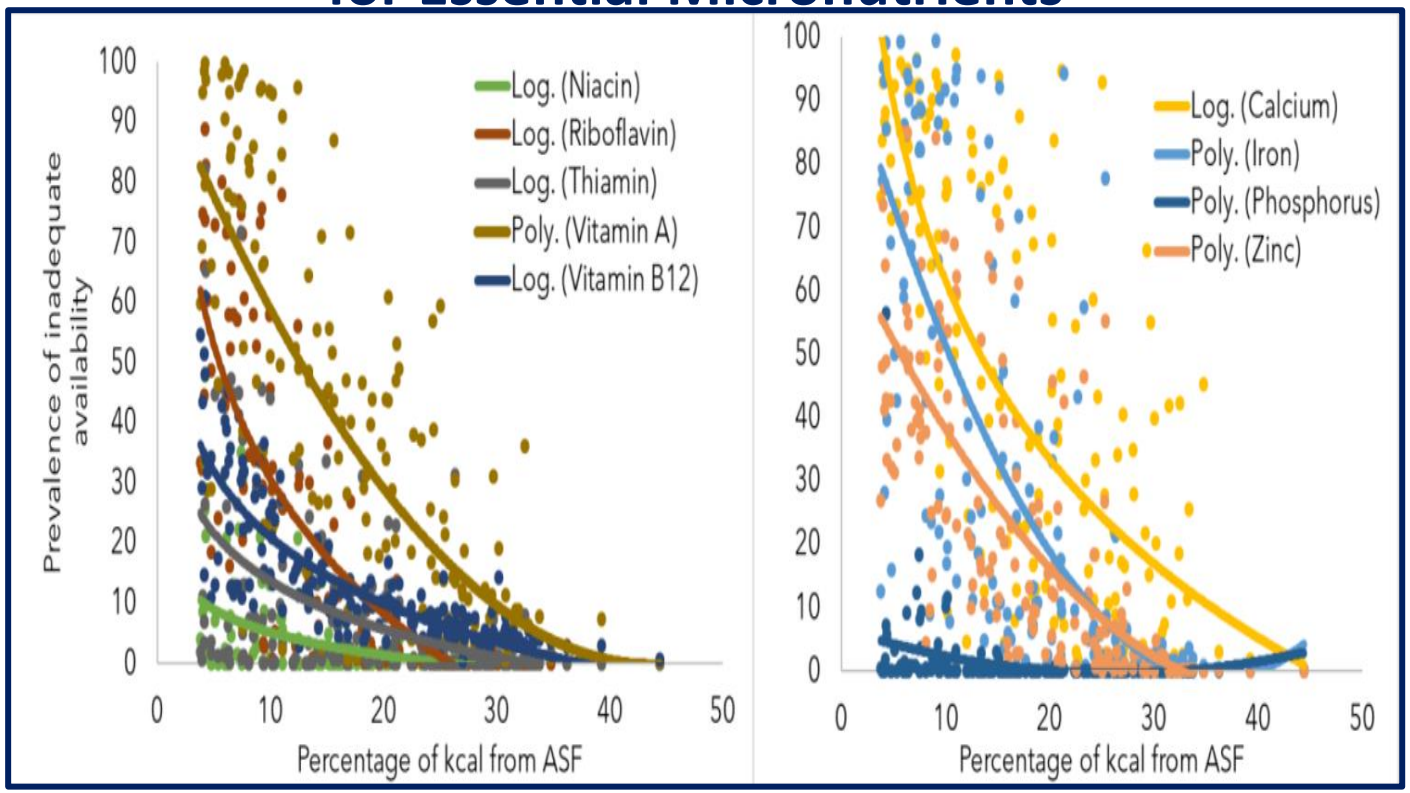
EAT–Lancet Commission confident that their diet would:

1. Benefit planetary health,
2. Provide nutrient adequacy,
3. Prevent NCD events

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

Only 13% of calories from ASFs in EAT-Lancet Diet

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

Animal-Source Foods are the 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

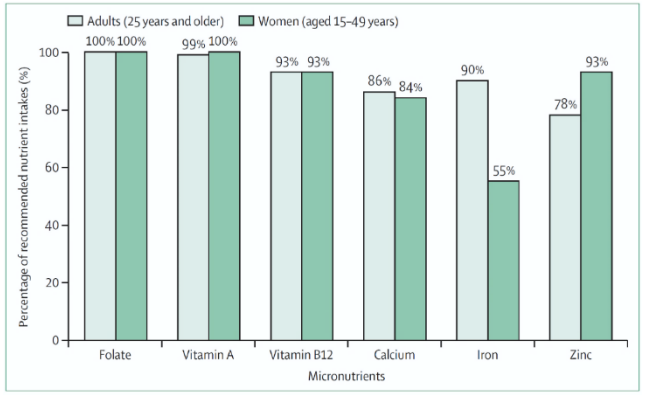
Beal T & Ortenzi F. Priority micronutrient density in foods. Frontiers in Nutrition 2022

Estimated micronutrient shortfalls of the EAT-Lancet planetary health diet.

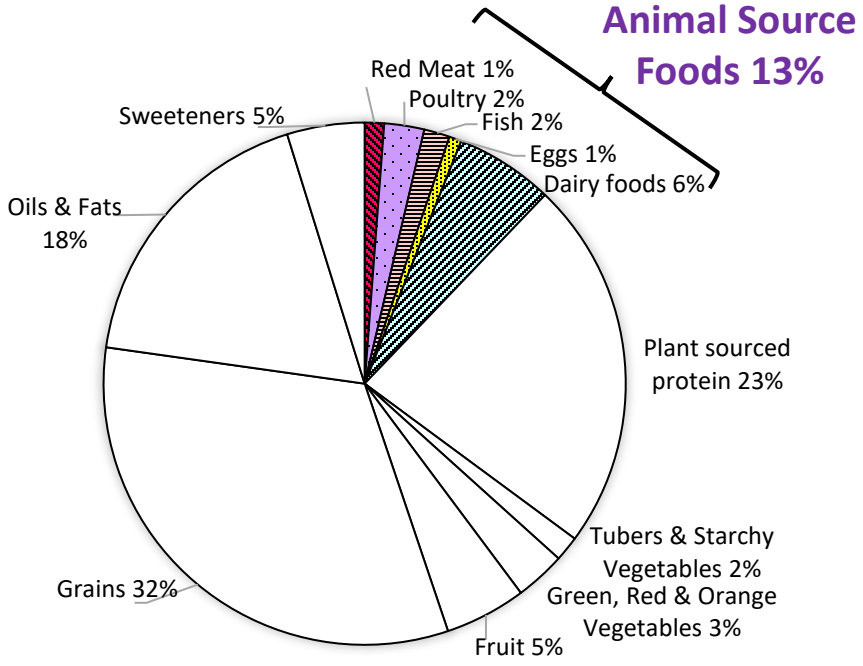
Beal T, Ortenzi F, Fanzo J.

Lancet Planet Health 2023.

Micronutrient Shortfalls

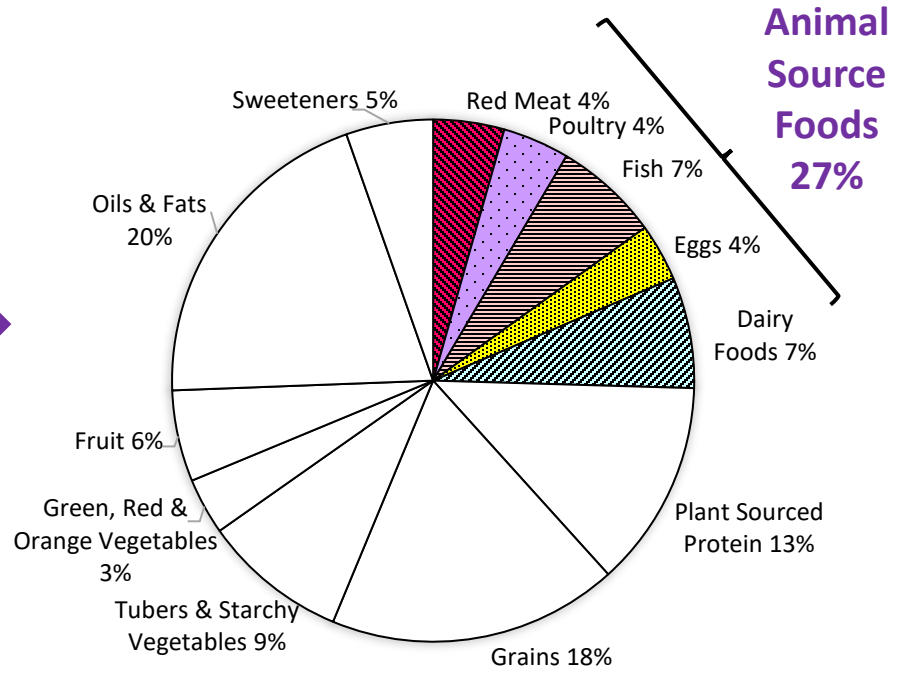


EAT–Lancet Planetary Health Diet



Micronutrient Adequacy

Adequate Diet for Adults



American Society for Nutrition
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The American Journal of
CLINICAL NUTRITION

journal homepage: https://ajcn.nutrition.org/

March 2024

Original Research Article

Impact of consuming an environmentally protective diet on micronutrients: a systematic literature review.

Ursula M Leonard, Clarissa L Leydon, Elena Arranz, Mairead E Kiely.

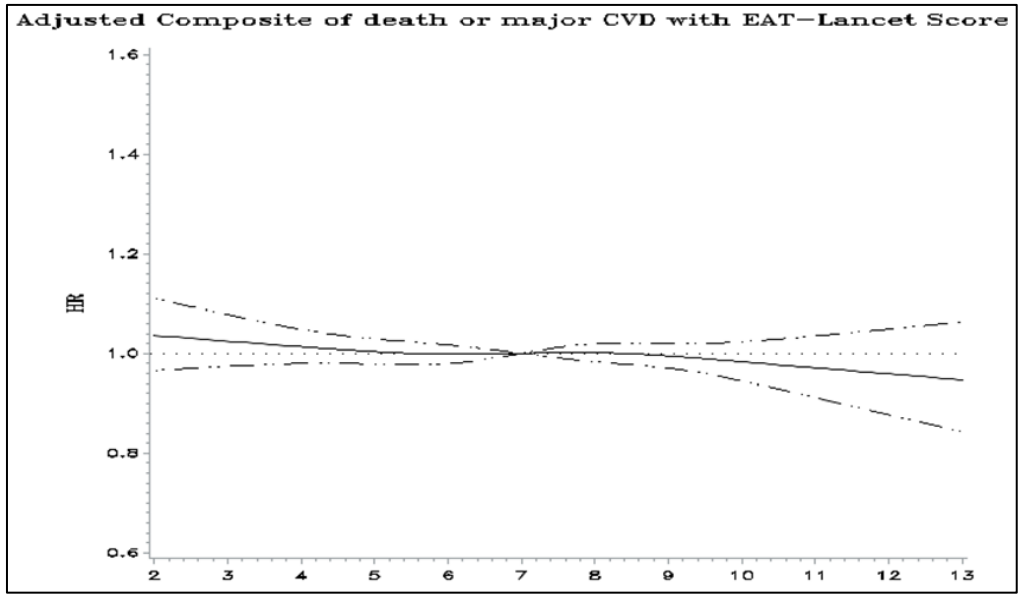
Editorial

Environmentally protective diets may come with trade-offs for micronutrient adequacy.

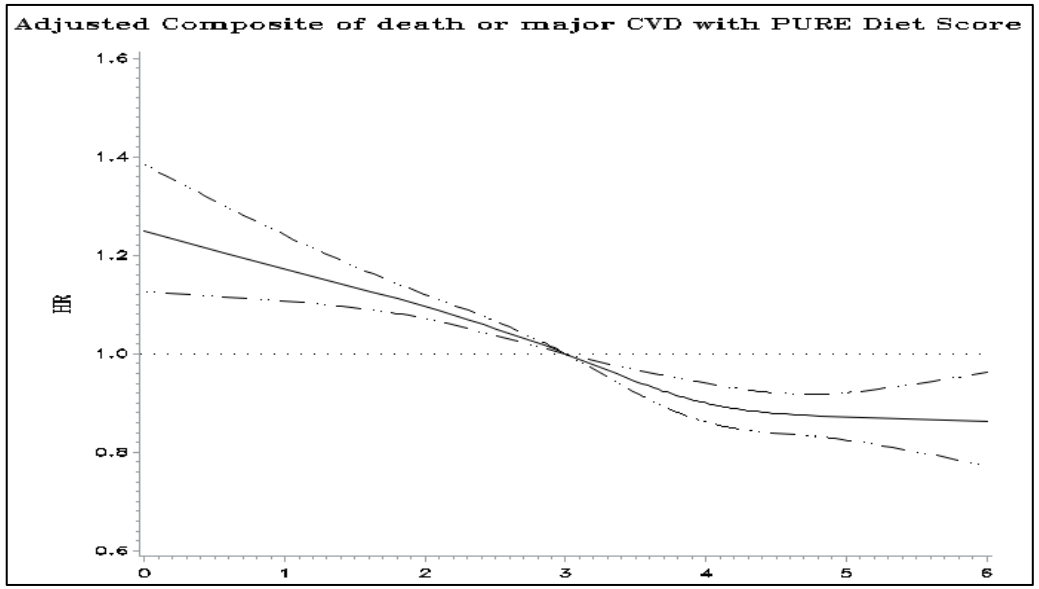
Ty Beal.

Type of food	Intake range
Rice and whole grain wheat	0 – 232 g
Tubers and starchy vegetables	0 – 100 g
Vegetables	200 – 600 g
Fruit	100 – 300 g
Dairy	0 – 500 g
Red meat, unprocessed	0 – 28 g
Poultry	0 – 58 g
Eggs	0 – 25 g
Fish	0 – 25 g
Legumes	0 – 100 g
Nuts	0 – 100 g
Sweets	0 – 31 g
Healthy added fats, unsaturated to saturated fat ratio *	> 1.8 *

The EAT-Lancet Commission also predicted that widespread uptake of the reference diet would reduce global mortality by 11 million deaths BUT;



Maximum adherence to the Planetary Health Diet provided no additional protection.



Each quintile higher PURE diet score associated with 8% lower risk of death, 6% lower risk of major cardiovascular events

Diet, Cardiovascular disease & mortality in 80 countries. Mente A et al. Eur Heart J 2023.

Other Recent Publications Continue to Recommend Dramatic Reductions or Total 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

Nick Watts, Markus Amann, Nigel Arnell, Sonja Ayeb-Karlsson, Jessica Beagley, Kristine Belesova, Maxwell Boykoff, Peter Byass, Wenjia Cai, Diarmid Campbell-Lendrum, Stuart Capstick, Jonathan Chambers, Samantha Coleman, Carole Dalin, Meaghan Daly, Niheer Dasandi, Shouro Dasgupta, Michael Davies, Claudia Di Napoli, Paula Dominguez-Salas, Paul Drummond, Robert Dubrow, Kristie L Ebi, Matthew Eckelman, Paul Ekins, Luis E Escobar, Lucien Georgeson, Su Golder, Delia Grace, Hilary Graham, Paul Haggar, Ian Hamilton, Stella Hartinger, Jeremy Hess, Shih-Che Hsu, Nick Hughes, Slava Jankin Mikhaylov, Marcia P Jimenez, Ilan Kelman, Harry Kennard, Gregor Kiesewetter, Patrick L Kinney, Tord Kjellstrom, Dominic Kniveton, Pete Lampard, Bruno Lemke, Yang Liu, Zhao Liu, Melissa Lott, Rachel Lowe, Jaime Martinez-Urtaza, Mark Maslin, Lucy McAllister, Alice McGushin, Celia McMichael, James Milner, Maziar Moradi-Lakeh, Karyn Morrissey, Simon Munzert, Kris A Murray, Tara Neville, Maria Nilsson, Maquins Odhiambo Sewe, Tadj Oreszczyn, Matthias Otto, Fereidoon Owfi, Olivia Pearman, David Pencheon, Ruth Quinn, Mahnaz Rabbaniha, Elizabeth Robinson, Joacim Rocklöv, Marina Romanello, Jan C Semenza, Jodi Sherman, Liuhua Shi, Marco Springmann, Meisam Tabatabaei, Jonathon Taylor, Joaquin Triñanes, Joy Shumake-Guillemot, Bryan Vu, Paul Wilkinson, Matthew Winning, Peng Gong, Hugh Montgomery*, Anthony Costello**

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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The 2020 report of The *Lan*... climate change: respond...

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

...onal, and national burden of stroke and its risk ...0–2019: a systematic analysis for the Global ...of Disease Study 2019

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Reducing dairy intake from 800 to 200 mls/day increases life expectancy by one year.

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

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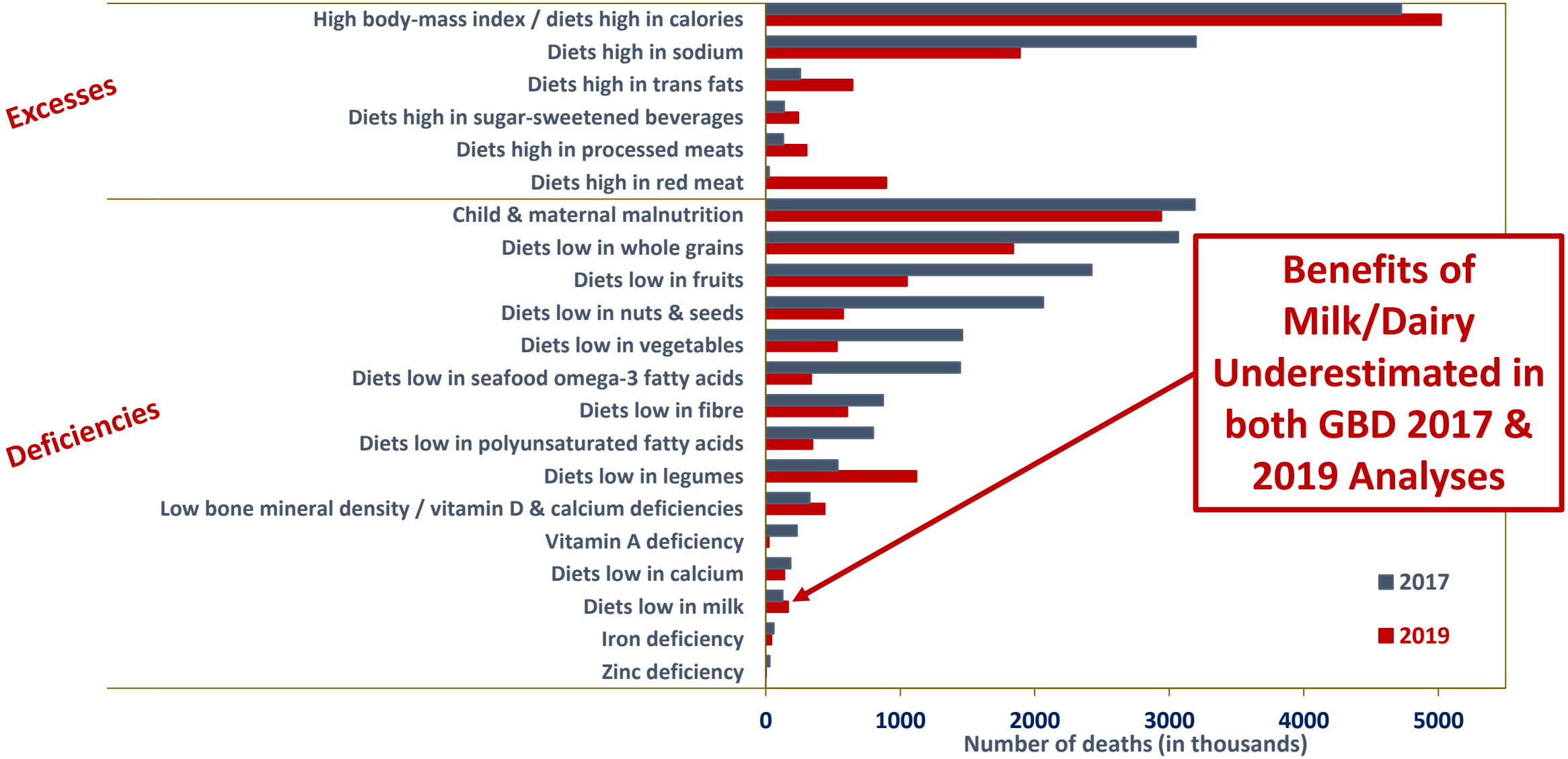
Dietary Risks and Deaths

THE LANCET

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



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October 2020

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Institute for Health Metrics and Evaluation (2018) GBD Compare. Seattle, WA: IHME, University of Washington. http://vizhub.healthdata.org/gbd-compare.

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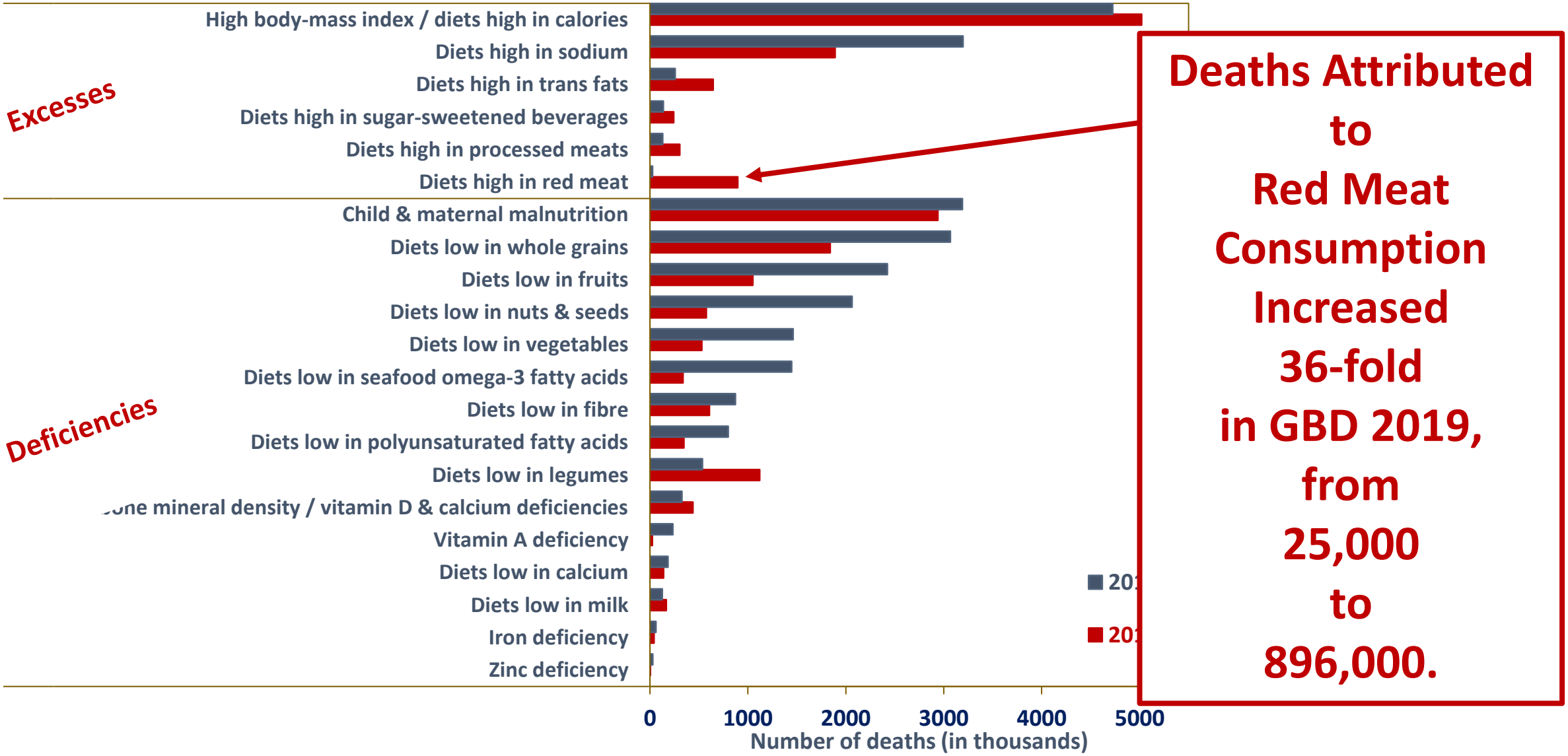


Deaths Attributed to Red Meat Consumption Increased 36-fold in GBD 2019, from 25,000 to 896,000.

THE LANCET

February 2022

CORRESPONDENCE

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

RCSI, Vrije Universiteit Brussel, QUB, University of Melbourne, UCD, Ghent University

THE LANCET

April 2022

CORRESPONDENCE

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

Institute for Health Metrics & Evaluation, University of Washington, Seattle

Twitter

April 2022

@GuyattGH

Professor Gordon Guyatt

McMaster University

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

THE LANCET

August 2022

CORRESPONDENCE

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

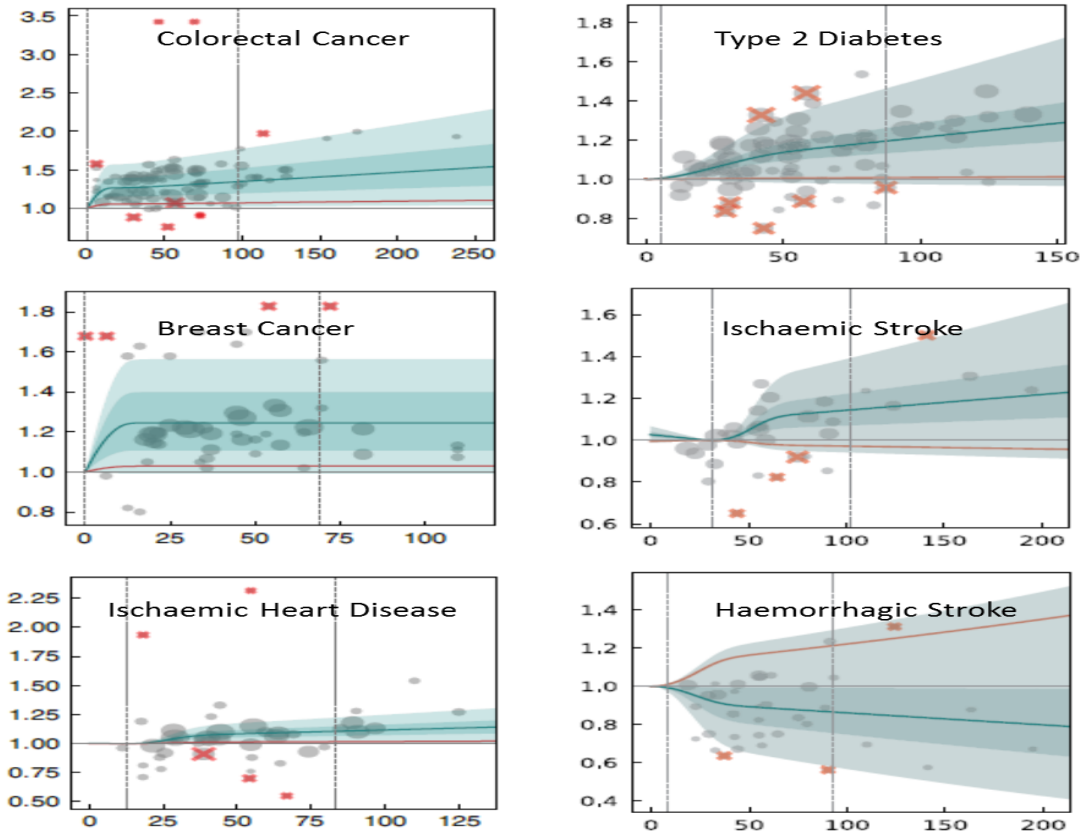
Academy of Nutrition Sciences & World Cancer Research Fund

nature medicine

October 2022

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]

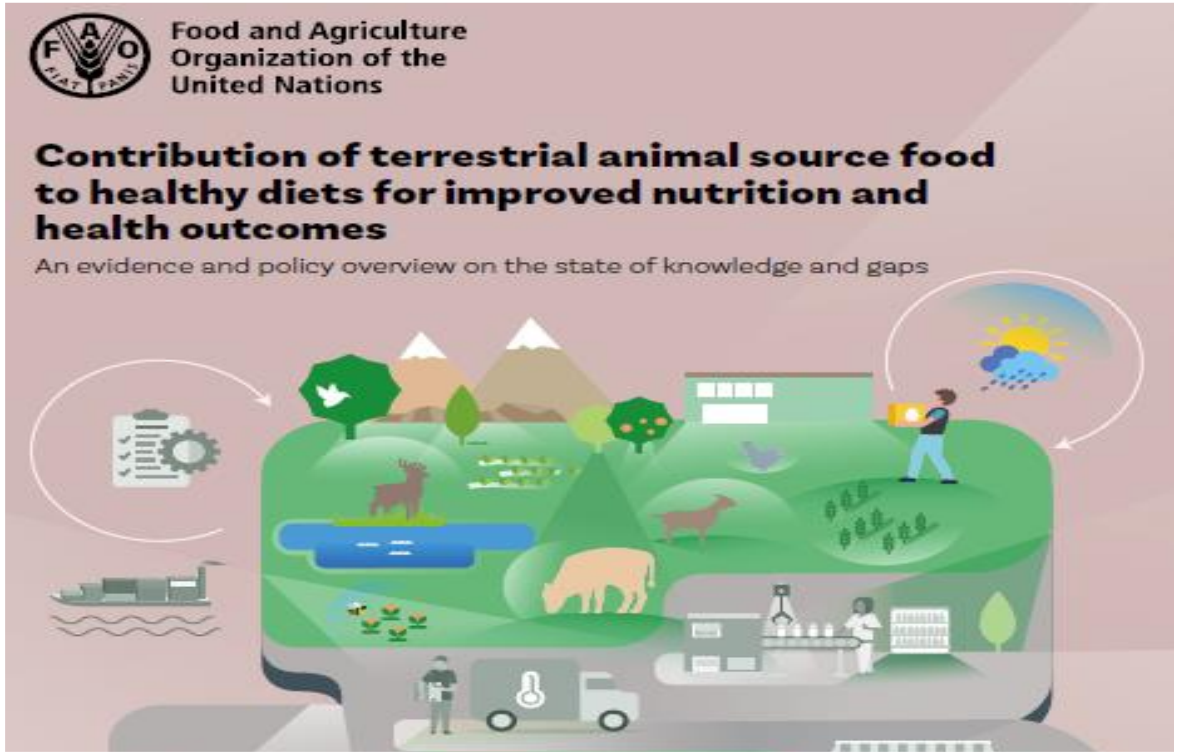


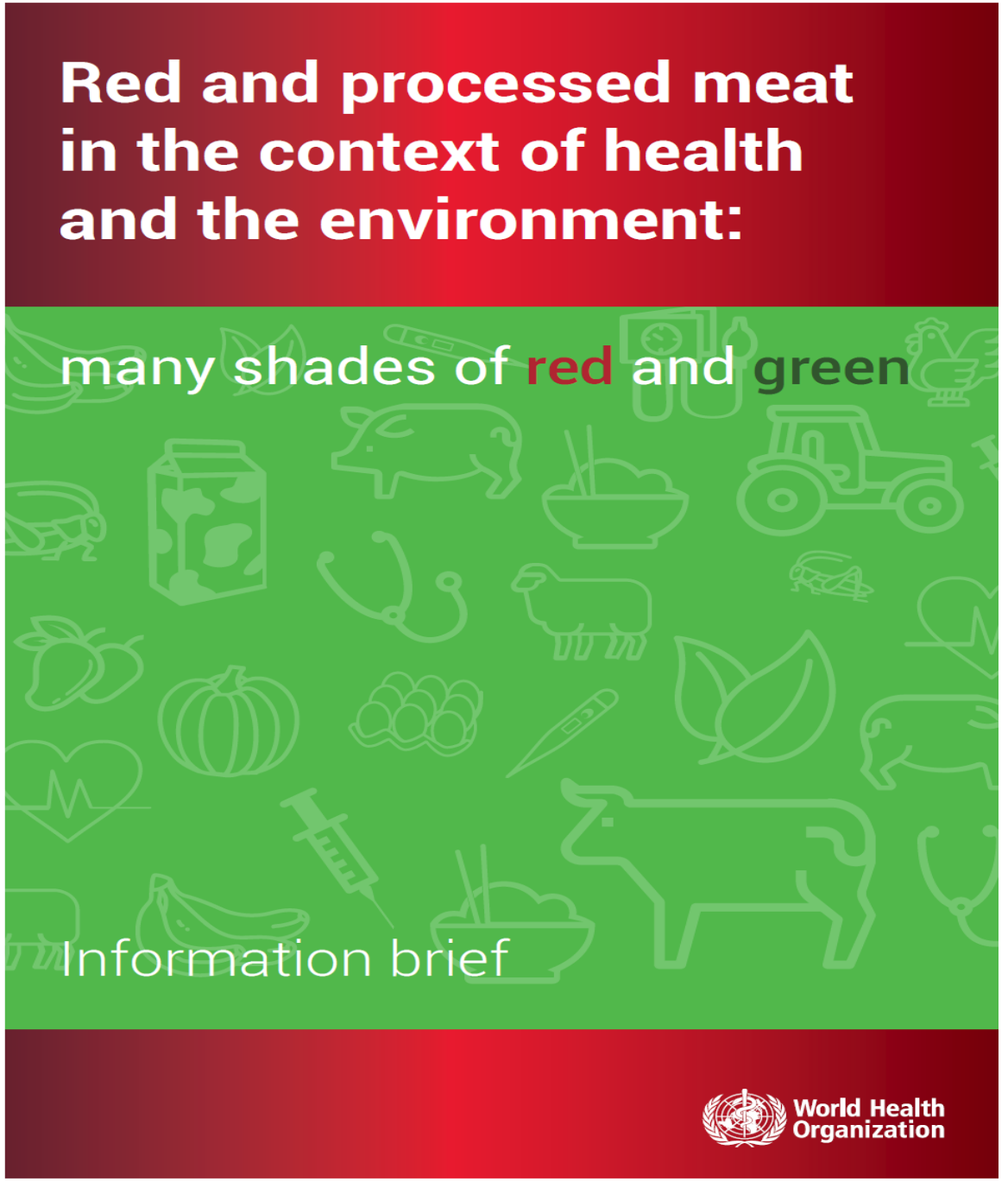
Very Different Conclusions from GBD Collaborators Concerning Risks of Red Meat

- "No or very weak evidence that unprocessed red meat is associated with any increased risk."
- "Evidence insufficient to make any strong or conclusive recommendations."
- "95% uncertainty interval for the TMREL for unprocessed red meat is very wide (0-200g/d)." – optimal intake could be as high as 200g per day.

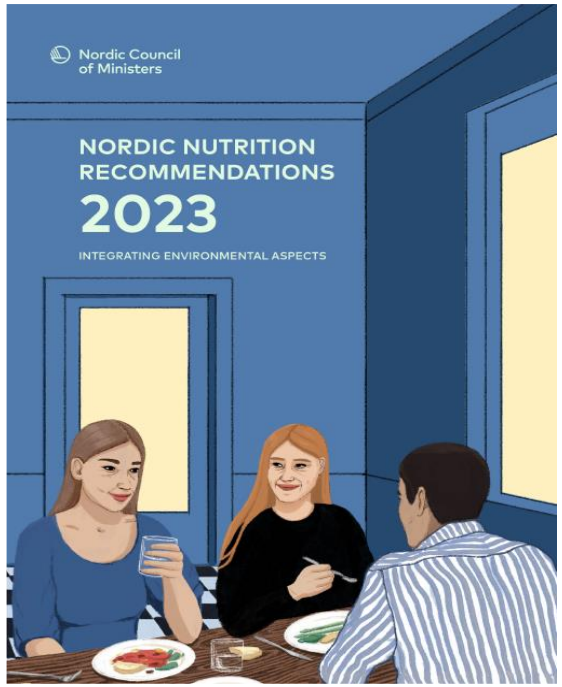
Recent UN FAO & WHO Reports have recognized;

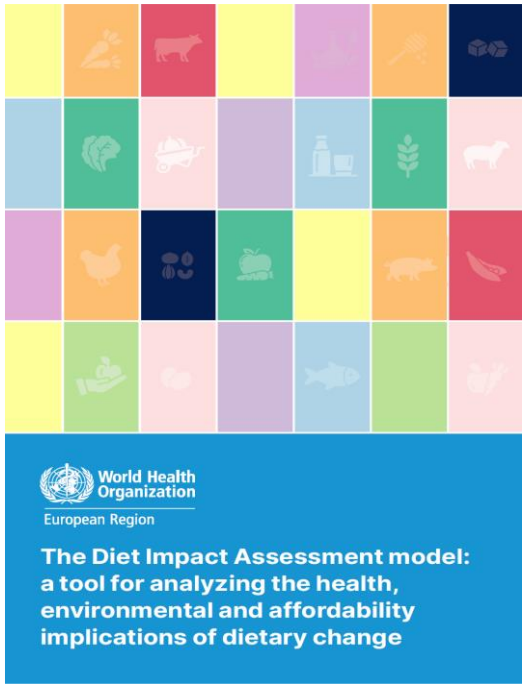
- The nutrient richness of ASFs
- The evidence concerning red meat and NCD risk is weak and insufficient for conclusive recommendations.
- The positive impacts of dairy on NCDs

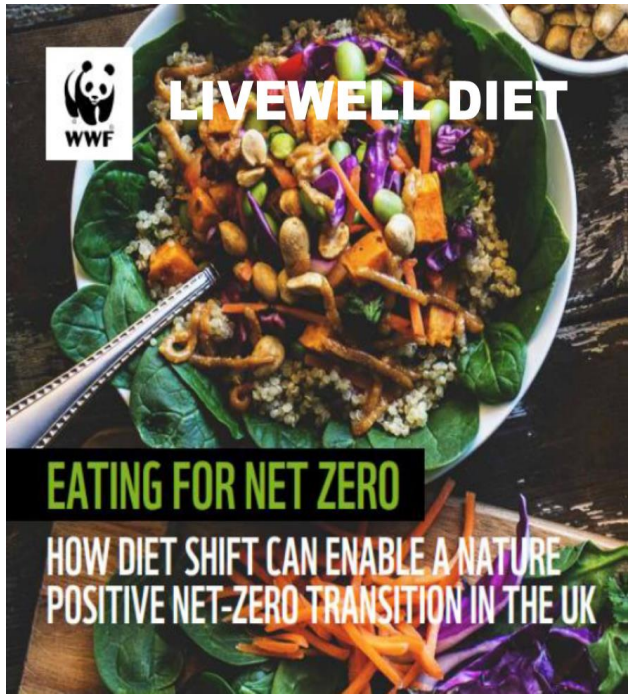


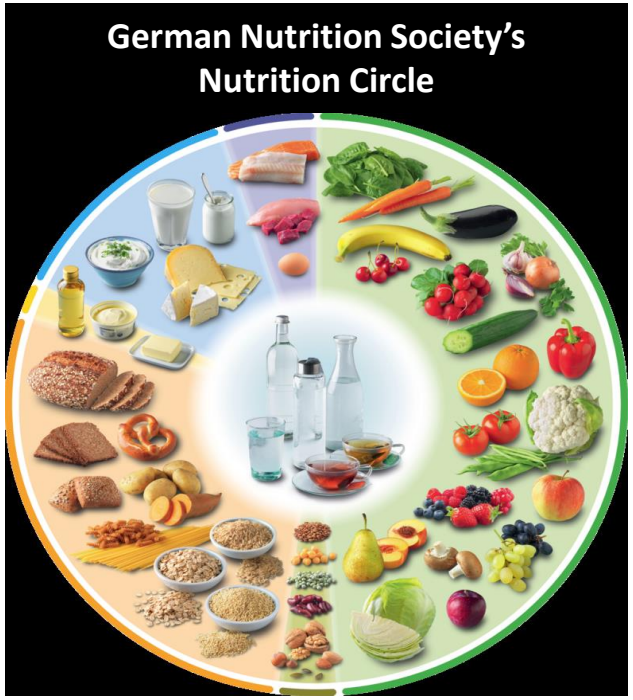


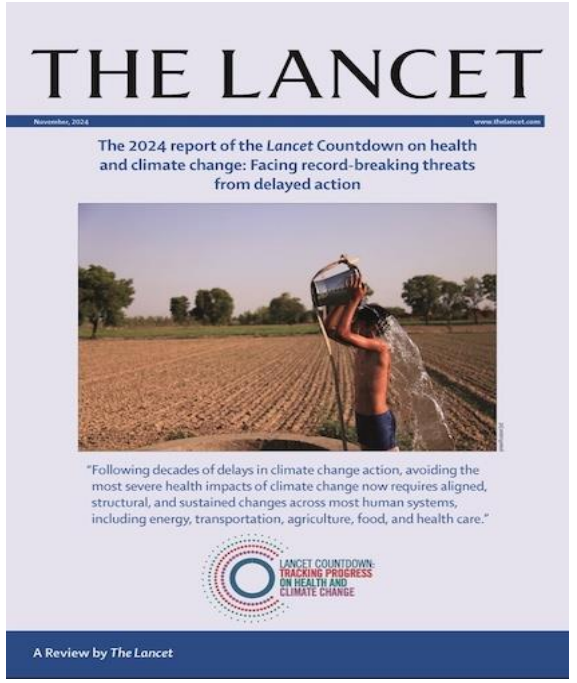
Multiple Publications, Policy Documents and Dietary Guidelines Continue to Reference / Be Influenced by EAT-Lancet and Recent GBD Risk Factor Reports











Key Take Home Messages

- Consumption of dairy foods contributes importantly to nutritional security. Dairy foods protect against both
  - Malnutrition, and
  - Non-communicable diseases (NCDs),
- Scientists, policy-makers and all involved in the food system should be extremely wary of reports, guidelines or global health estimates that;
  - Are not rigorously & transparently evidence-based, and/or
  - Ignore the protections against nutritional deficiencies & chronic diseases afforded by animal-source foods.
- Consumption of nutrient-rich, sustainably produced, animal-sourced foods, in appropriate evidence-based quantities, should continue to be included in national and international guidelines for a healthy, balanced diet.

RCSI UNIVERSITY OF MEDICINE AND HEALTH SCIENCES

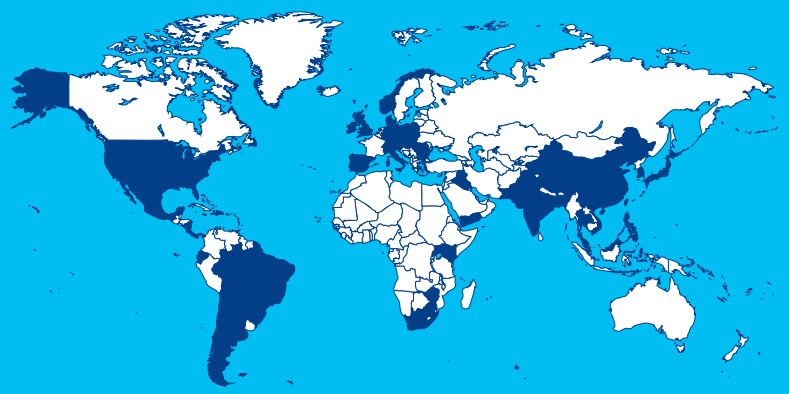
Food for Development

School feeding programmes and the role of milk

Tetra Pak®
PROTECTS WHAT'S GOOD

History of school feeding

Since 1962, we have participated in the development of school feeding and nutrition programmes, which have provided value to children and society around the world.



In 2024

66 million children

in 49 countries received milk or other nutritious beverages in Tetra Pak packages during the school year.

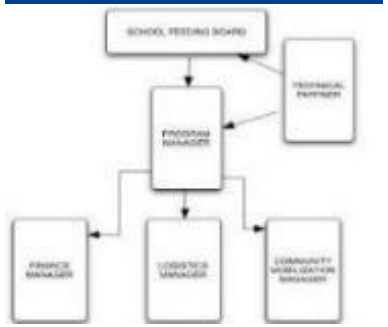
Our purpose:

We commit to making food **safe**
and **available, everywhere**
and we promise to protect what's good:
food, people and the **planet.**

Value added support to school feeding

We provide technical assistance and share best practices used in school milk programmes around the world

Administrative modalities



Community sensitization

School selection & preparation

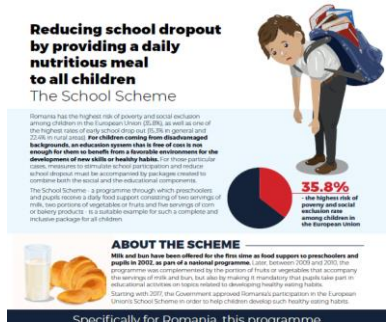
Sharing ideas in communication

Implementation training

Food Safety best practices

Monitoring and assessments

Advocacy and promotion



Working in partnership

Collaborates with the public sector in many countries, mostly with Ministries of Agriculture and Ministries of Education.

Partners with donor organisations such as Sida and GIZ.

Maintains a strong network within the United Nations, collaborating with UN Global Compact, World Food Programme (WFP) and Food and Agriculture Organization (FAO).

Cooperates with many non-governmental organisations such as Global Child Nutrition Foundation (GCNF) and International Dairy Federation (IDF)

School Milk Knowledge Hub

Bringing together knowledge on school milk programs from around the world

Case studies

National School Milk Programme (Dairy Association of China, 2021)

SCHOOL MILK CASE STUDIES National School Milk Programme (Dairy Association of China) Providing milk and free lunches across schools in China Location ....

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The smarter lunchrooms movement of California

Consuming nutritious food is important at all stages of life, but especially for children and adolescents.....

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New school milk program in Sri Lanka also promotes food safety and recycling

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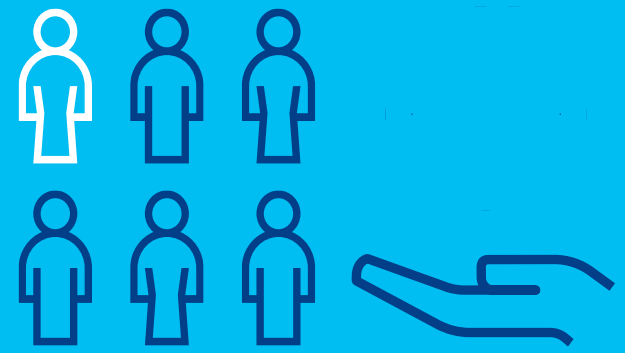
Global overview of school feeding and role of milk

Global view of school feeding

At least **418** million children in **176 countries** are reached by school meal programmes, mainly funded through government budgets.

One out of six children in developing countries – roughly **100 million children** – are underweight.

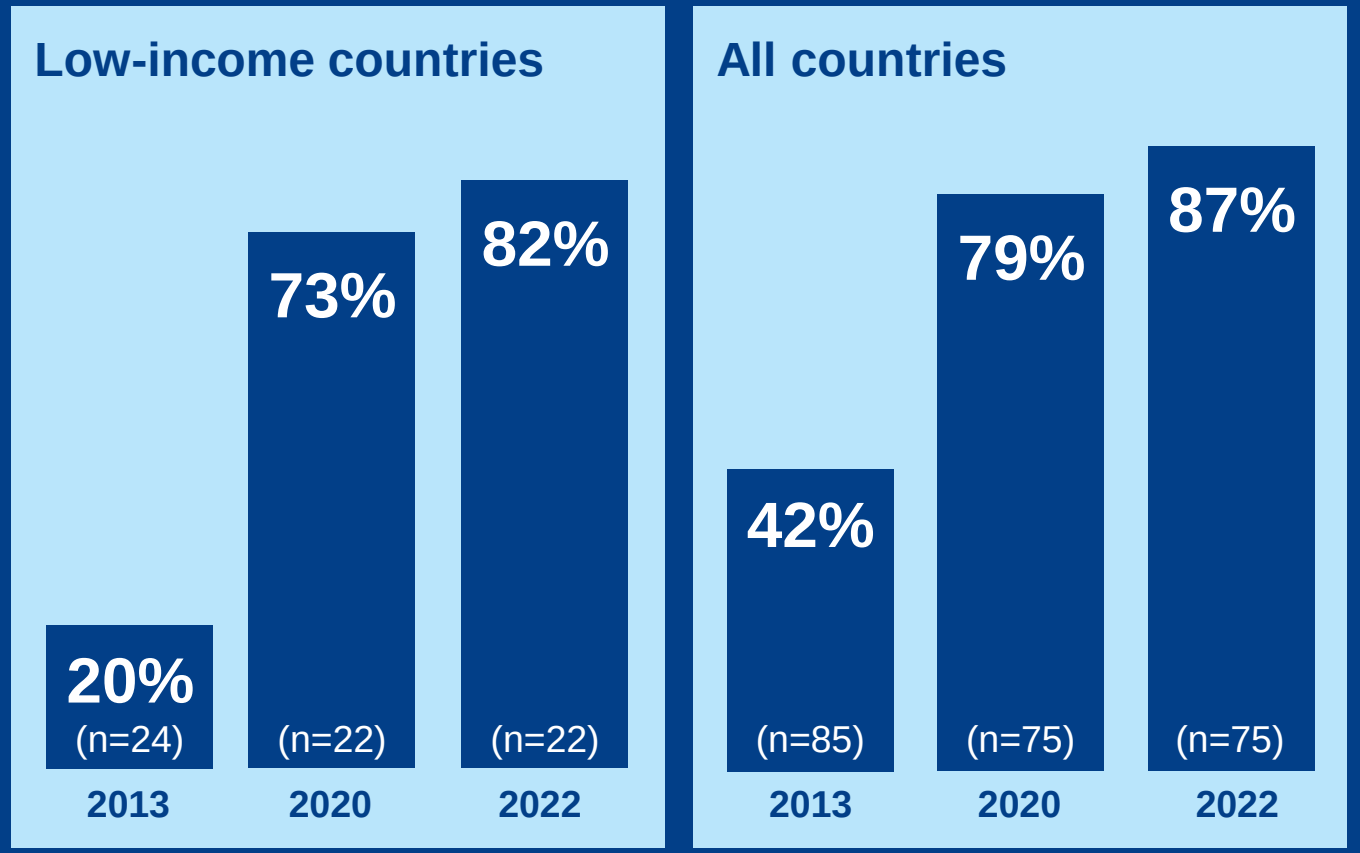


Source: World Food Programme, State of School Feeding Worldwide 2022.

4 of 5

low-income countries (**82%**) have policy for school meals.

Globally, almost 9 of 10 countries (**87%**) have such policies in place.

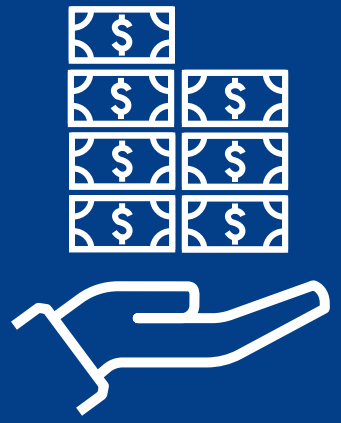


Source: World Food Programme, State of School Feeding Worldwide 2022.

Global annual investment in school feeding is estimated at

US$48 billion → **in 176** countries

Source: World Food Programme, State of School Feeding Worldwide 2022.

$1 → **$7** 

School Feeding could yield substantial benefits for the program costs invested, with at least **$7** of returns for every **$1** invested.

Source: Verguet, S., Limasalle, P., Chakrabarti, A., Husain, A., Burbano, C., Drake, L., & Bundy, D. A. P. (2020). The Broader Economic Value of School Feeding Programs in Low- and Middle-Income Countries: Estimating the Multi-Sectoral Returns to Public Health, Human Capital, Social Protection, and the Local Economy. Frontiers Public Health, 8, 587046

Global view of school milk

210 million children receive milk in schools

- At least 210 million children in 104 countries receive milk in schools
- 150 – 250ml is the most common serving size
- Plain semi-skimmed is most common, followed closely by plain whole milk.
- Milk is provided for free or at a subsidized cost in the majority of programmes.
- 94% of respondents indicated that the programme focuses on improving child health and nutrition.
- Carton packages are used in most programmes (67%)

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Source: International Dairy Federation. (2024). The state of milk and milk products in school programmes around the world - Contributing to global child nutrition and development. (Bulletin of the IDF N° 531/2024). https://doi.org/10.56169/HXUZ6019

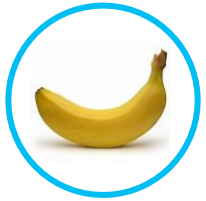
They are called essential for a reason.

milk's nine essential nutrients can help kids and teens grow healthy and strong.

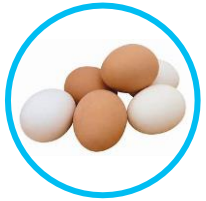
Milk Means More | milk life | MilkPEP

USDA National Nutrient Database for Standard Reference, Release 27

A package of milk gives kids as much…



Potassium as one small banana



Protein as 1 ½ medium egg

Riboflavin as ½ cup of whole almonds

Niacin as 20 cherry tomatoes

Calcium as 10 cups of raw spinach

Phosphorus as 1 cup of canned kidney beans

Vitamin B-12 as 4 ounces of cooked turkey

Vitamin D as ¾ ounces of cooked salmon

Vitamin A as ¾ cup of broccoli

Source: USDA National Nutrient Database for Standard Reference, Release 27

Global examples of school milk and impact

China

Year programme started:	2000
Beverage:	White and flavoured milk
Type of package:	Tetra Classic® Aseptic 200 Tetra Brik® Aseptic 200 Tetra Prisma® Aseptic 200 Tetra Fino® Aseptic 200
Children reached by Tetra Pak packages in 2024:	19 800 000
Programme funder:	Parents and Government
Programme implementer:	Dairy Association of China (since 2013)
Customer/s delivering:	More than 80 customers

China

School milk programme impact

Height and weight:	Increase of at least 0.6% in height and 2.9% in weight during a 2-year period between targeted and control students
Bone mineral content (size adjusted) **and bone mineral density:**	Increase of at least 1.2% in bone mineral content and 3.2% in bone mineral density during a 2-year period between targeted and controls students
UHT milk production:	Increase in production from 200 million litres to 1 billion litres from 1999 to 2002. 27.5% of UHT milk production country-wide delivered to the school milk programme in 2002
Milk production:	Average growth rate of 19% from 2000 to 2002 as compared to an average growth rate of 5.5% between 1992 and 1999
Dairy cattle:	Increase from 4.6 million dairy cattle to 6.9 million from 1999 to 2002
Number of dairies:	Increase from 700 dairies to 1,600 dairies from 1999 to 2002
Dairy farmers income:	Increase from $2.15 billion US to $3.24 billion US from 1999 to 2002

Sources: British Journal of Nutrition July 2004; Beijing Prime Dairy Research Institute 2003.

Dominican Republic

Year programme started:	1992
Beverage:	White and flavoured milk
Type of package:	Tetra Brik® Aseptic 200
Children reached by Tetra Pak packages in 2024:	1 200 000
Programme funder:	Government
Programme implementer:	Ministry of Education
Customer/s delivering:	Pasteurizadora Rica, Pasteurizadora Ferrer, Induveca, Coprole (Gruplac), Coopesur and AGAMPTA

Dominican Republic

School milk programme impact

Anemia presence:	Reduced from 43.4% to 16.7% for children 6-14 yrs old (1993-2012)
Chronic malnutrition presence:	Reduced from 19.4% to 1.9% – i.e. anthropometric data (2002-2012)
Vitamin B12 presence:	12.6% of the children demonstrated lower than normal Vitamin B12 presence (2012) in comparison to the 22% average of children in Latin America
Vitamin A presence:	Vitamin A deficiency among children between 6 and 14 years old has practically disappeared during the last two decades

Source: UNDP. http://www.do.undp.org/content/dam/dominican_republic/docs/Pobreza/publicaciones/pnud_do_encuestamicronut2013.pdf

Kenya

Year programme started:	2012
Beverage:	Ambient white milk
Type of package:	Tetra Classic® Aseptic 200 Base
Children reached by Tetra Pak packages in 2024:	330 000
Programme funder:	Government and Parent-paid / Mombasa Trust Fund
Programme implementer:	Counties
Customer/s delivering:	NKCC, Githunguri Dairy, Meru Dairy

Kenya

School milk programme impact

School enrolment (Nairobi County):	+ 55% in targeted schools as compared to control schools
School enrolment (Mombasa County):	+ 25% in targeted schools as compared to control schools
School enrolment (Meru county):	+ 20% in targeted schools as compared to control schools
School enrolment (Embu county):	+ 14% in targeted schools as compared to control schools

Sources: Department of Education in Kenya; Kenya Dairy Board

Thailand

Year programme started:	1992
Beverage:	White milk
Type of package:	Tetra Brik® Aseptic 200 Slim Tetra Brik® Aseptic 250 Base Tetra Brik® Aseptic 200 Slim Leaf
Children reached by Tetra Pak packages in 2024:	4 800 000
Programme funder:	Government
Programme implementer:	School Milk Board (Livestock Department), Ministry of Agriculture and Cooperatives
Customer/s delivering:	Chiangmai Fresh Milk, Mary Anne Dairy, Wang Nam Yen Dairy, Dairy Farming Dairy Co-Operative, Phatthalung Dairy Cooperative, Gold Milk, Esan Tai Dairy, Sikhiu Agricultureal Co-Operative, Royal Chitralada, Rachadairy

Thailand

School milk programme impact

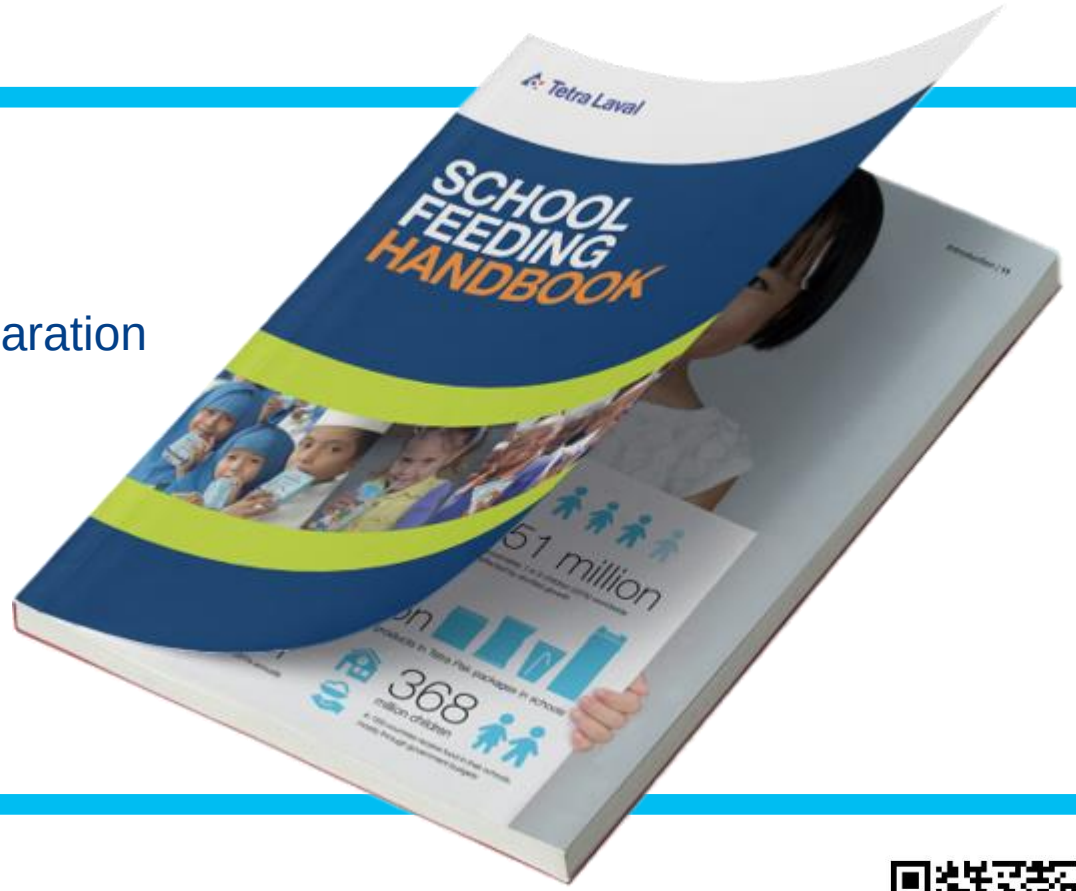
Malnutrition presence:	Reduced from 19% in 1990 to 10% in 1996-1997 and 5% in 2006
Height:	Children in the programme grew an additional 3 cm per year, in comparison to before programme implementation
Per capita milk consumption:	Increase from 2 litres in 1984 to as high as 20 litres in 1998.
Dairy market:	290 million litres in the early 1990s to 1 146 million litres in 2003
Number of dairy cooperatives:	62 in 1996 and 117 in 2009
Milk production:	The school milk programme uses 37% of the milk produced in Thailand

Sources: School Milk Program in Thailand, Dr. Issara Suwanabo; FAO; Dairy Council of Thailand.

School Feeding Handbook

A practical guide

- Programme management
- Measuring impact
- School nomination, confirmation and preparation
- Warehouse management
- Stock movement
- Beverage carton consumption
- Monitoring
- Beverage carton package disposal



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