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FEEDING A GROWING GLOBAL POPULATION - the role for dairy?

Prof. Jeremy Hill PhD MNZM

Professor of Sustainable Nutrition, Riddet Institute, Massey University
Chief Science & Technology Officer, Fonterra

Pasture Summit 2021, July 7





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How does the world feed the world?

What is Possible

What is Practical

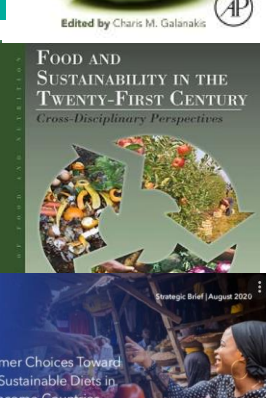
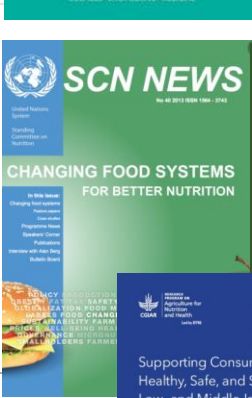
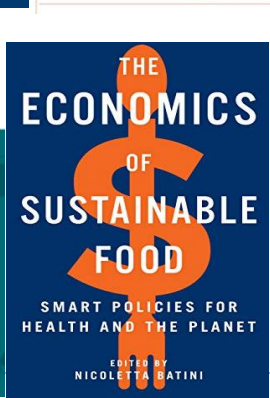
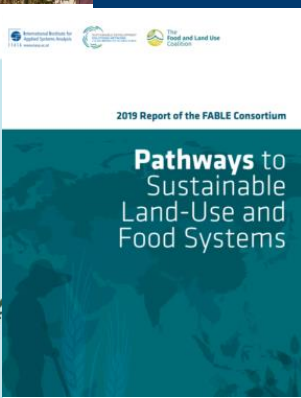
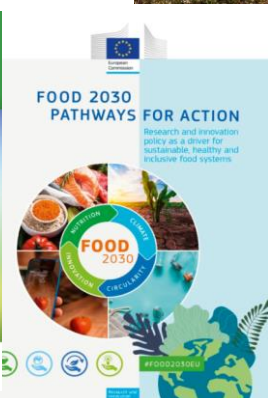
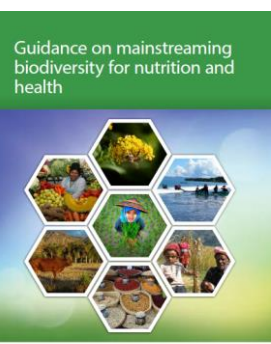
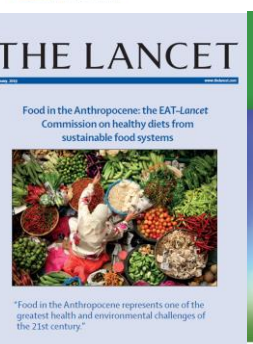
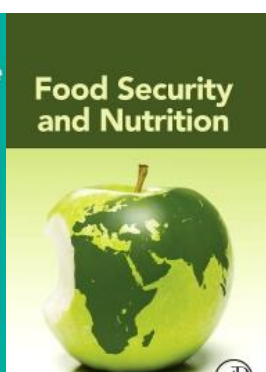
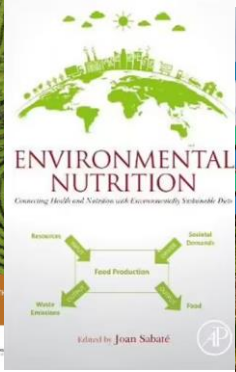
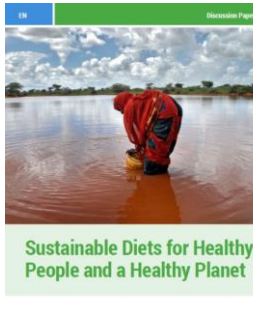
What is Optimal

Thought for Food

SNippets

Delta Model

Sustainable Food Systems & Nutrition



Sustainable Food Systems & Nutrition



United Nations



Food Systems Summit 2021



Action Track 1

Ensure access to safe and nutritious food for all



Action Track 4

Advance equitable livelihoods



Action Track 2

Shift to sustainable consumption patterns



Action Track 5

Build resilience to vulnerabilities, shocks and stress



Action Track 3

Boost nature-positive production

Sustainable Food Systems



Action Track 1

Ensure access to safe and nutritious food for all

“are food systems that ensure **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”



Action Track 2

Shift to sustainable consumption patterns



Action Track 3

Boost nature-positive production



Action Track 4

Advance equitable livelihoods



Action Track 5

Build resilience to vulnerabilities, shocks and stress

Food Losses and Waste in the context of Sustainable Food Systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security.



Nutrition comes first “food security and nutrition for all...”

- Enough food produced
 - Energy
 - Macronutrients
 - Micronutrients
- Food is well distributed so all have access
- Sufficient production to cope with adverse events



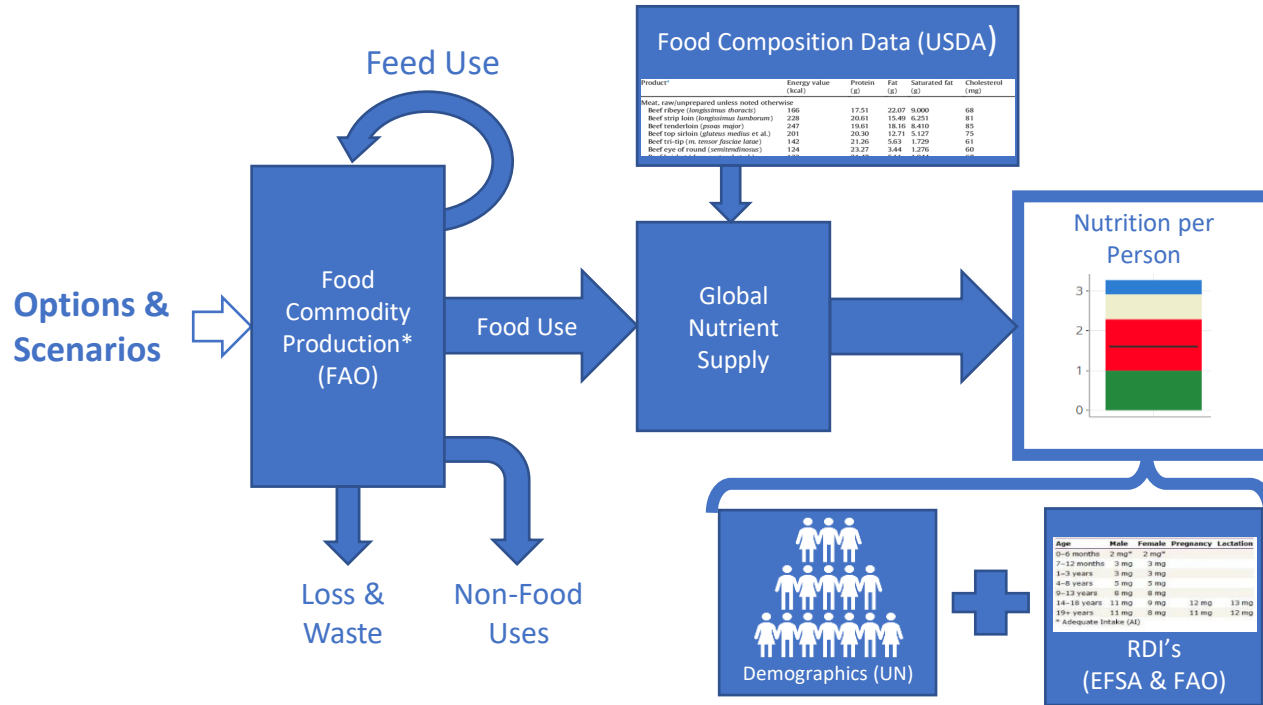
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We can
model this!



Global Nutrition: the DELTA Model



Use of the DELTA Model to Understand the Food System and Global Nutrition

Smith N W, Fletcher A J, Dave L A, Hill J P, McNabb W C (2021)

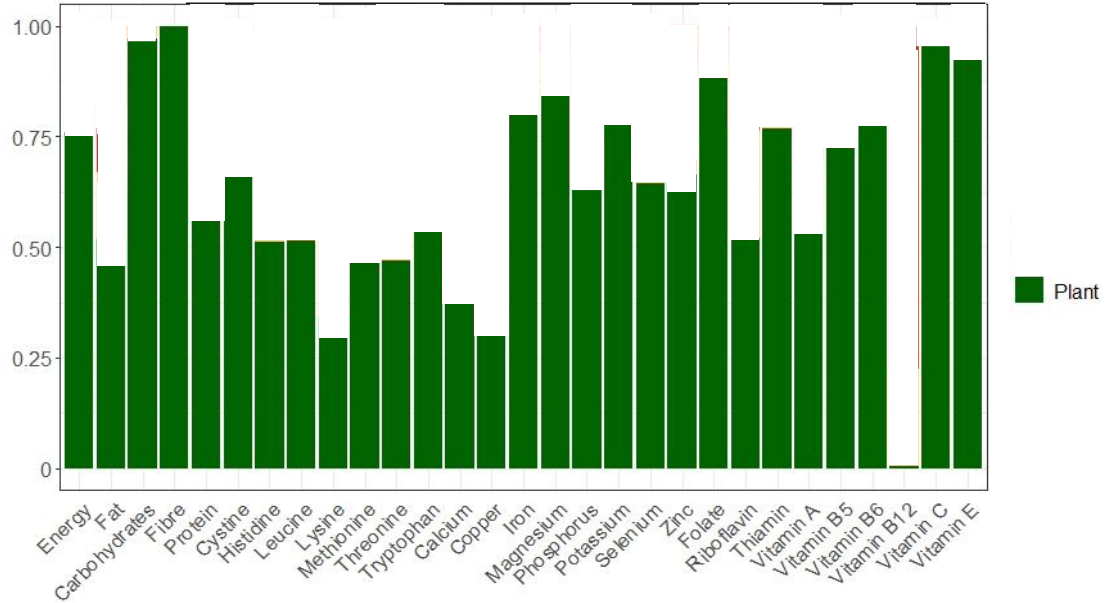
The Journal of Nutrition

<https://doi.org/10.1093/jn/nxab199>

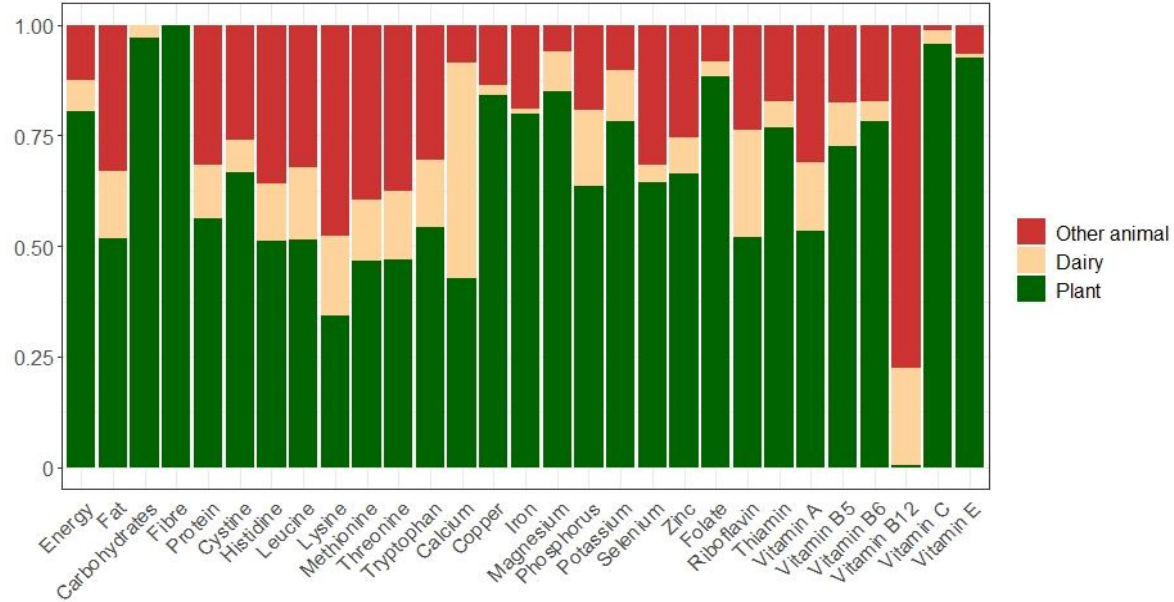
DELTA Model: Global Nutrition



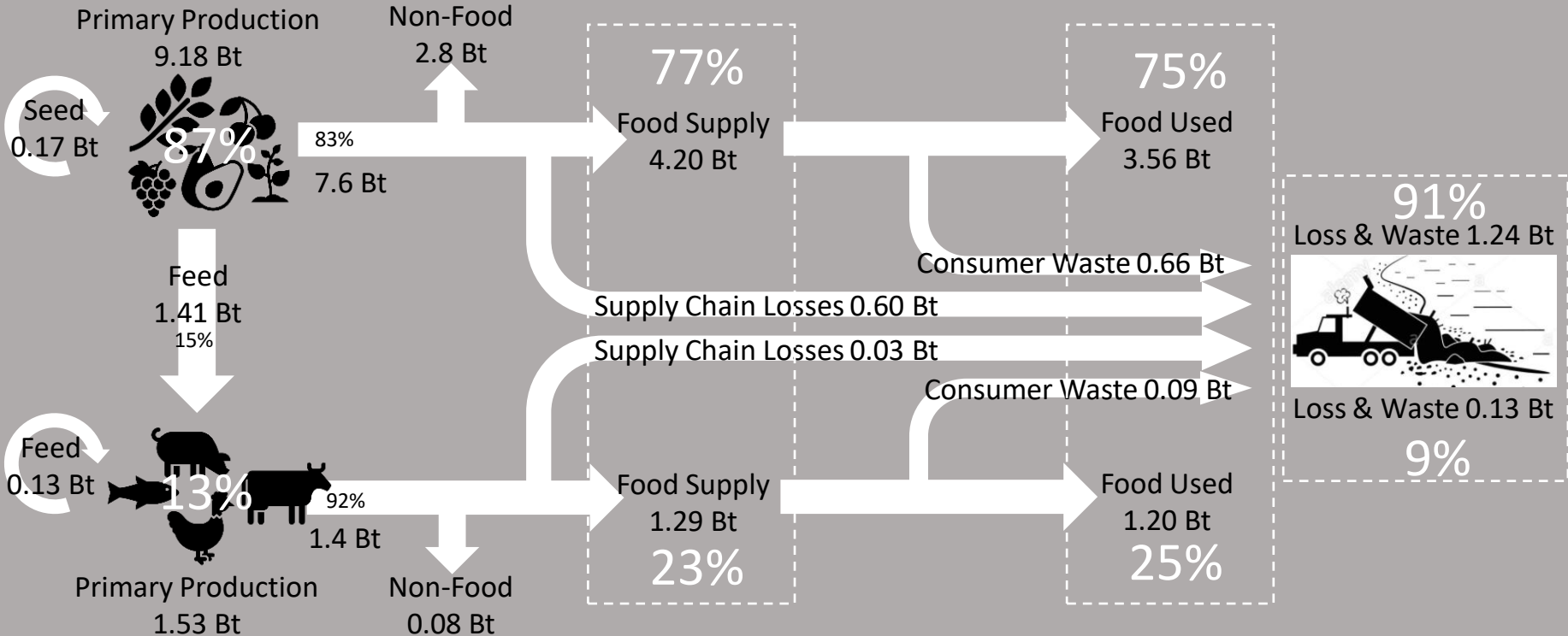
Global Nutrition: Plant Based



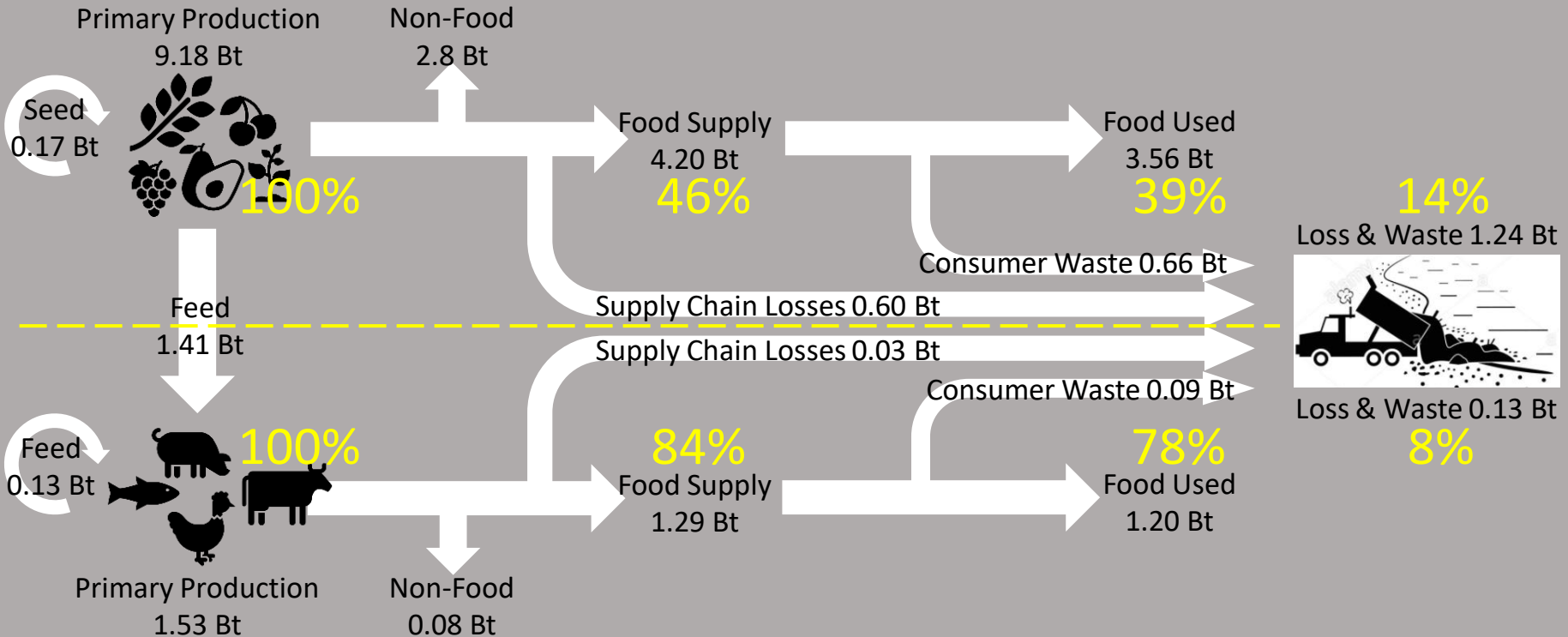
Global Nutrition: Plant Based & Animal Optimized



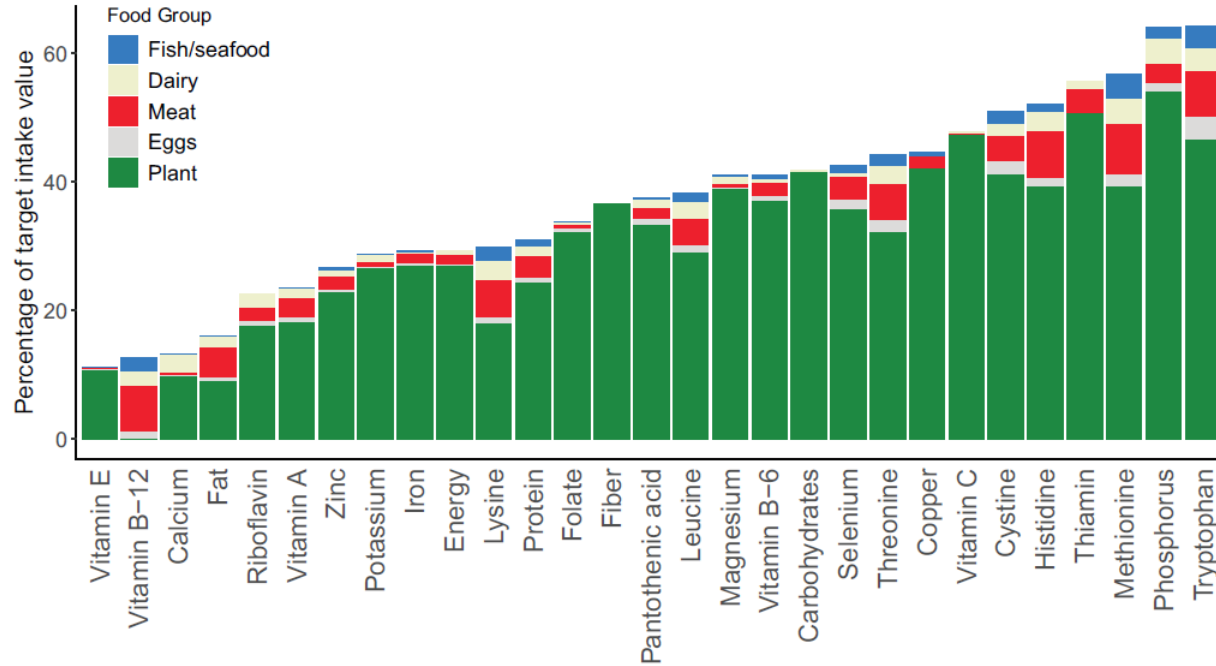
Global Nutrition: Plant Based & Animal Optimised



Global Nutrition: Plant Based & Animal Optimised



Global Nutrition: Waste



Global Nutrition: Nutrient Availability

- There is enough food energy, carbohydrate, protein and fat (i.e. macronutrients) currently produced in the world to feed more than 8.5 billion people
- Malnutrition and protein malnutrition (undernourishment) results from unequal distribution of food, equality/affordability i.e. a lack of choice, poor choices, geo-politics etc.
- Micronutrients and trace elements (“hidden hunger”) are more of a problem;
 - Calcium
 - Vitamin E
 - Vitamin B12
 - Iron
 - Potassium
 - Etc.

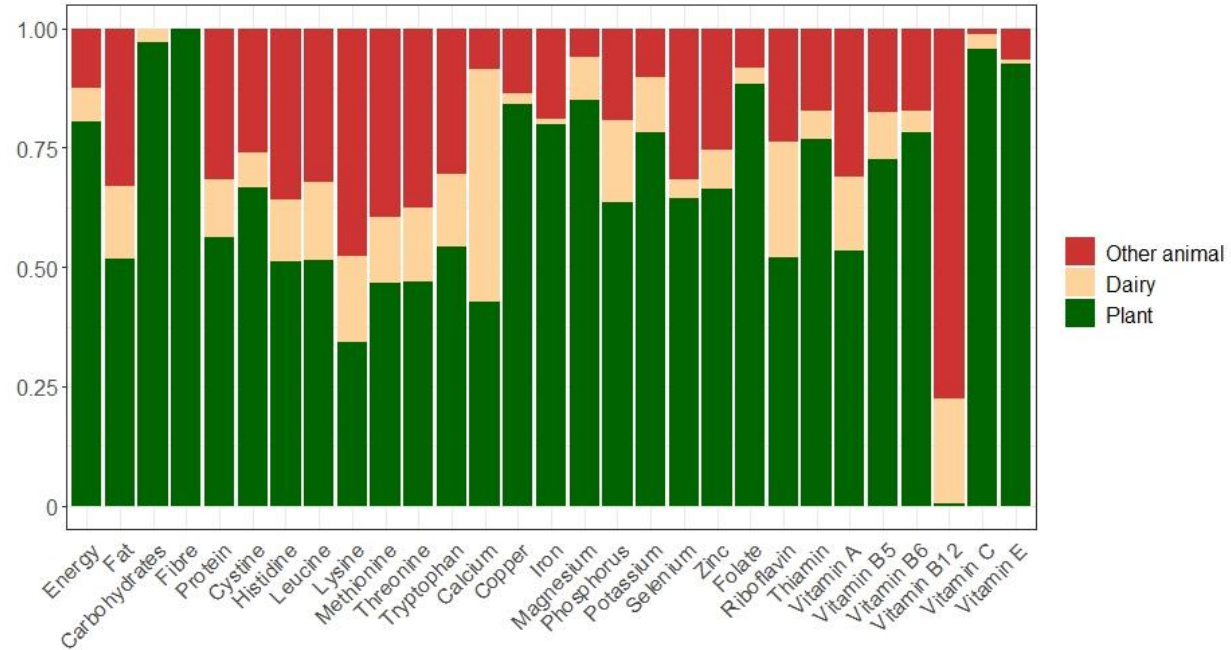


Global Nutrition: Dairy as a Nutrient Rich/Dense Food

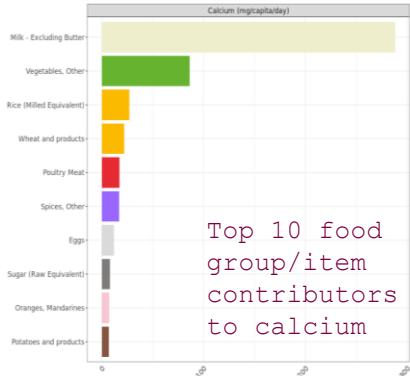
Proportion of global nutrient availability from dairy (7-8% food biomass)

- 49% calcium
- 24% Vitamin B2
- 22% Vitamin B12
- 18% of EAA
- 15% Vitamin A
- 12% of protein

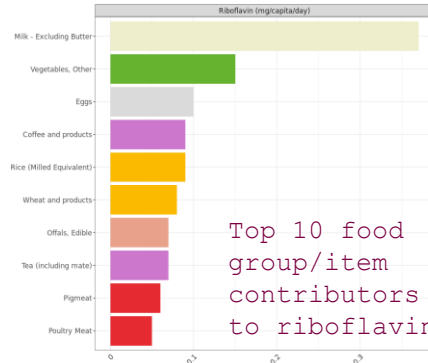
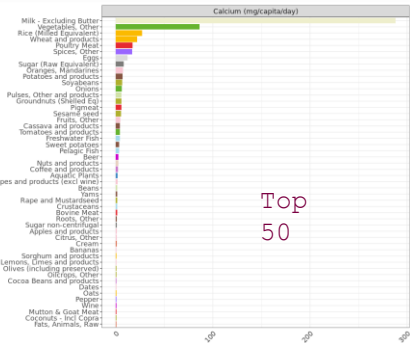
Only 7% dietary energy so not only **NUTRIENT RICH** but also **NUTRIENT DENSE**



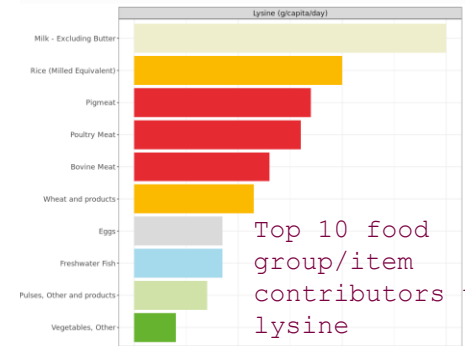
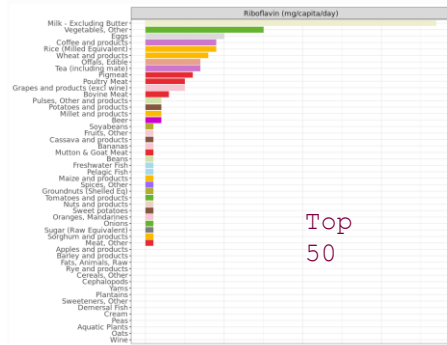
Global Nutrition: Dairy as a Nutrient Rich/Dense Food



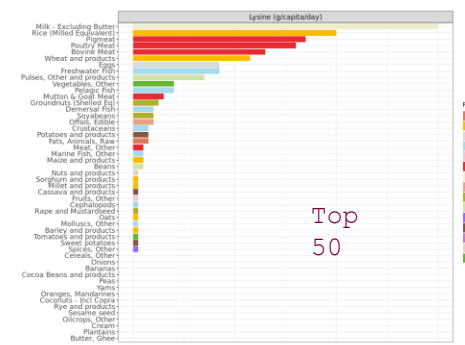
Top 10 food group/item contributors to calcium



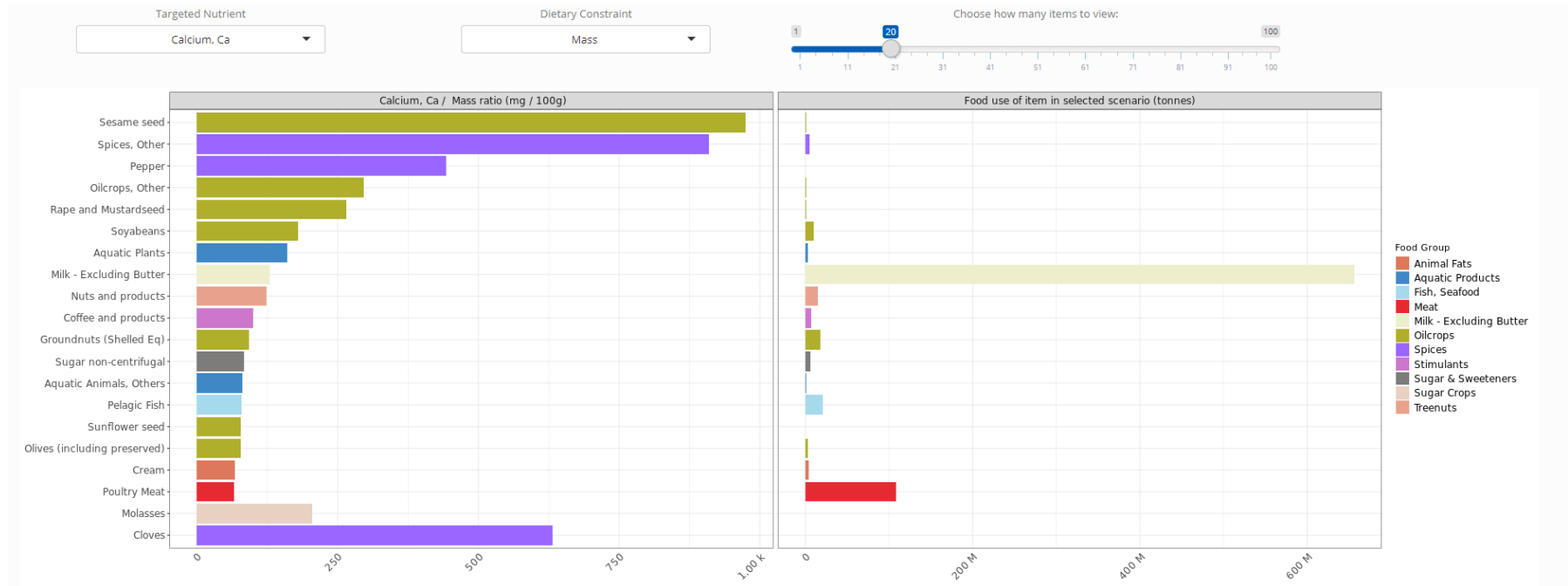
Top 10 food group/item contributors to riboflavin



Top 10 food group/item contributors to lysine



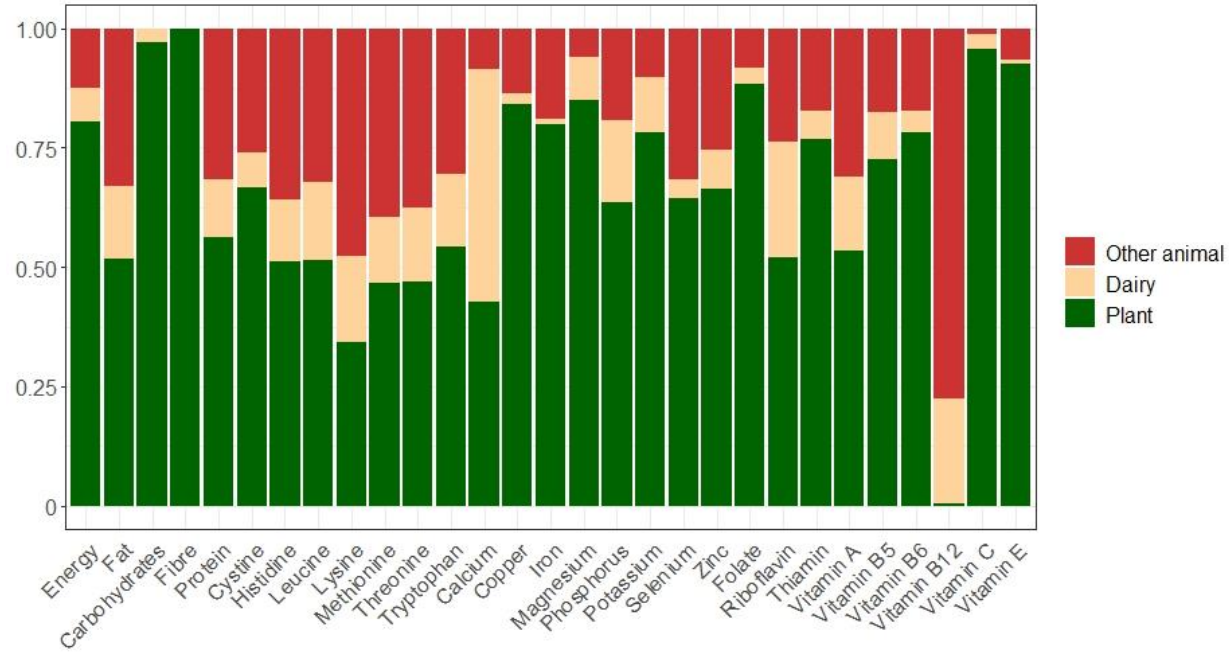
Global Nutrition: Dairy as a Nutrient Rich/Dense Food



Global Nutrition: Dairy is important but....

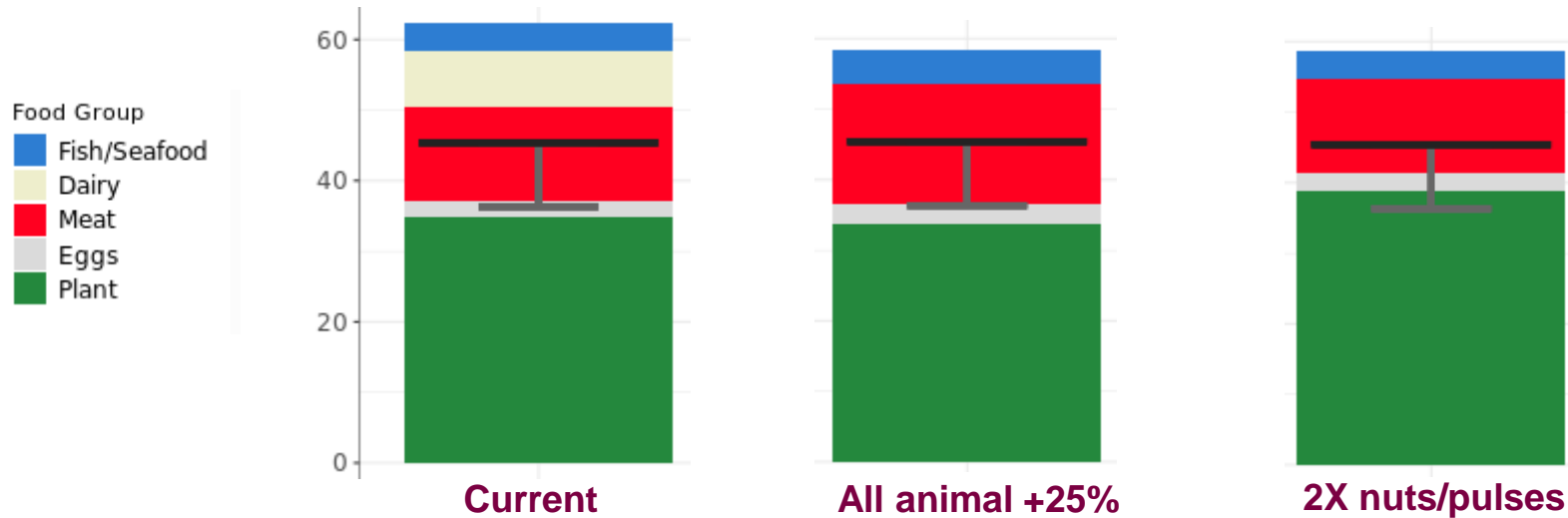
Is not a good source of all nutrients!

- Carbohydrates
- Copper
- Iron
- Selenium
- Folate
- Vitamin C
- Vitamin E



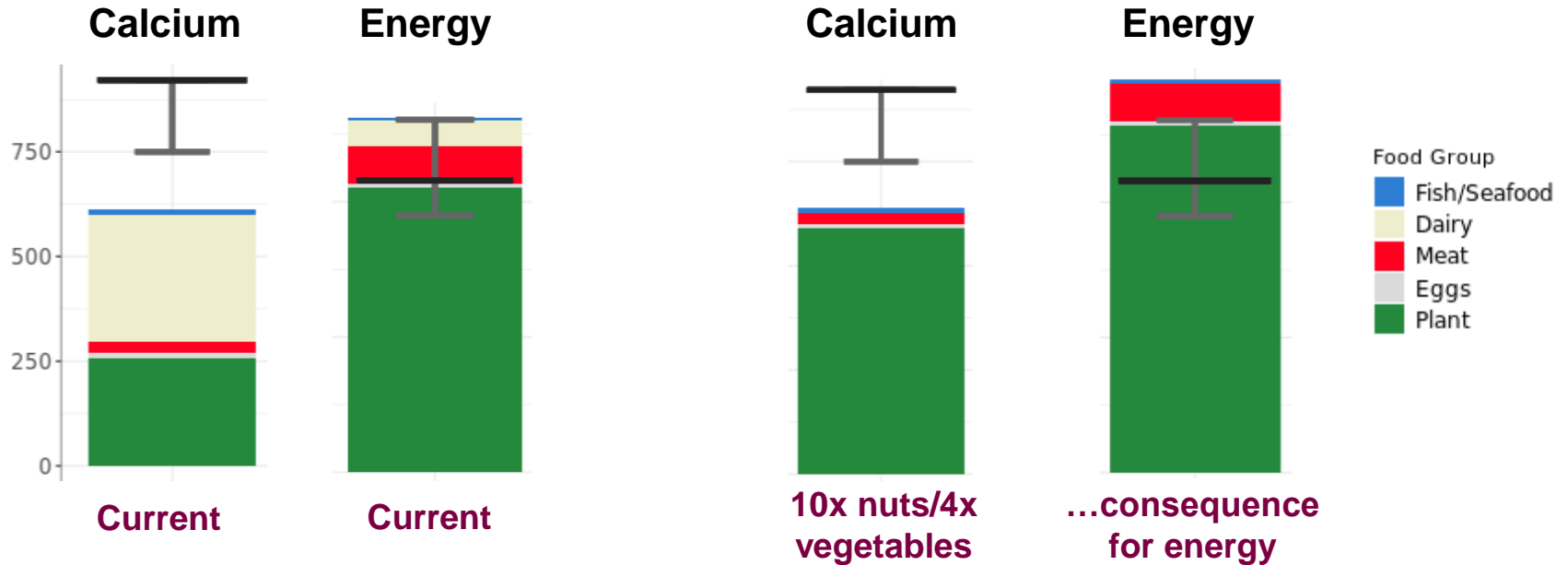
Global Nutrition: Can we replace MILK?

If ONLY considered as a source of protein: YES



Global Nutrition: Can we replace MILK?

As a nutrient dense food? NO!

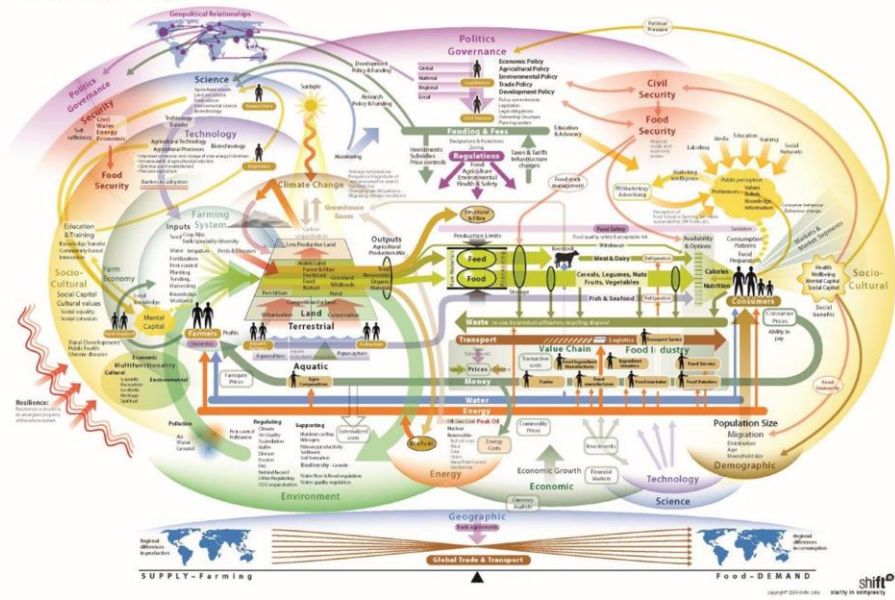


But isn't Sustainable Nutrition more than just Nutrition?

Yes but:

- **Nutrition comes first!** For a food system to claim to be sustainable it must first provide for the minimum nutrient requirements of the global population.
- **And also** cater to a wide range of complex and interconnected environmental and socioeconomic requirements.

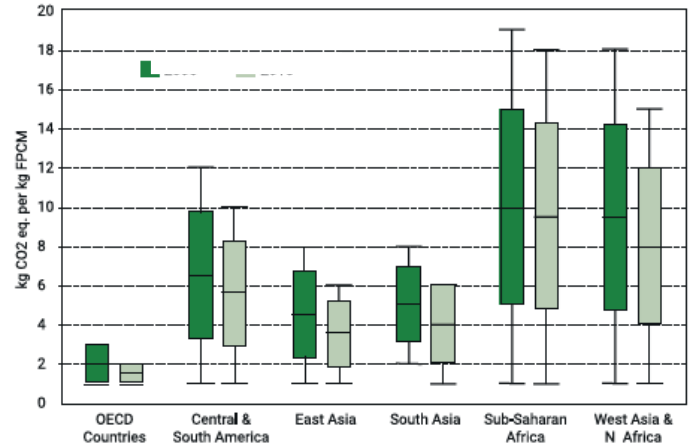
Global Food System Map



What about Greenhouse Gas and Global Warming?

- **Should we reduce dairy consumption to save the planet?**

- **20-30% of GHG from the food system**
- **2-3% of GHG from dairy within the food system**
- **For 49% of our calcium, 24% of our Vit B2, 22% Vit B12, 18% essential amino acids, 15% Vit A and 12% overall protein requirements.**



- **When you look at it this way the answer is clearly NO and dairy looks like a pretty good deal.**
- **A good deal, but not a perfect deal and we should focus on making large improvements to the efficiency of milk production.**





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**Its not always what we expect
or what we have been told**



SNi team

- Prof. Jeremy Hill
- Prof. Warren McNabb
- Dr Andrew Fletcher
- Dr Nick Smith



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