Diets and planetary impacts

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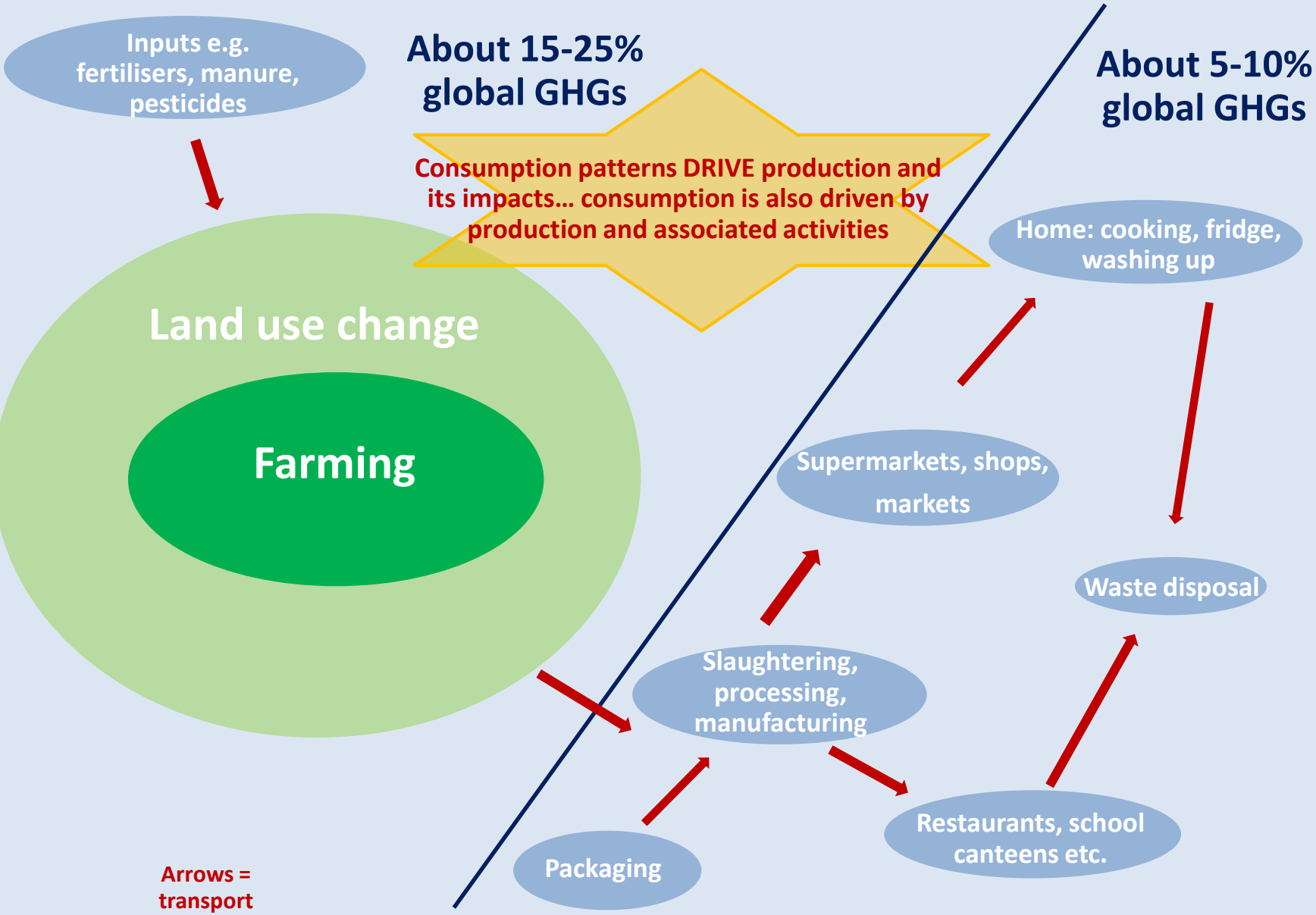
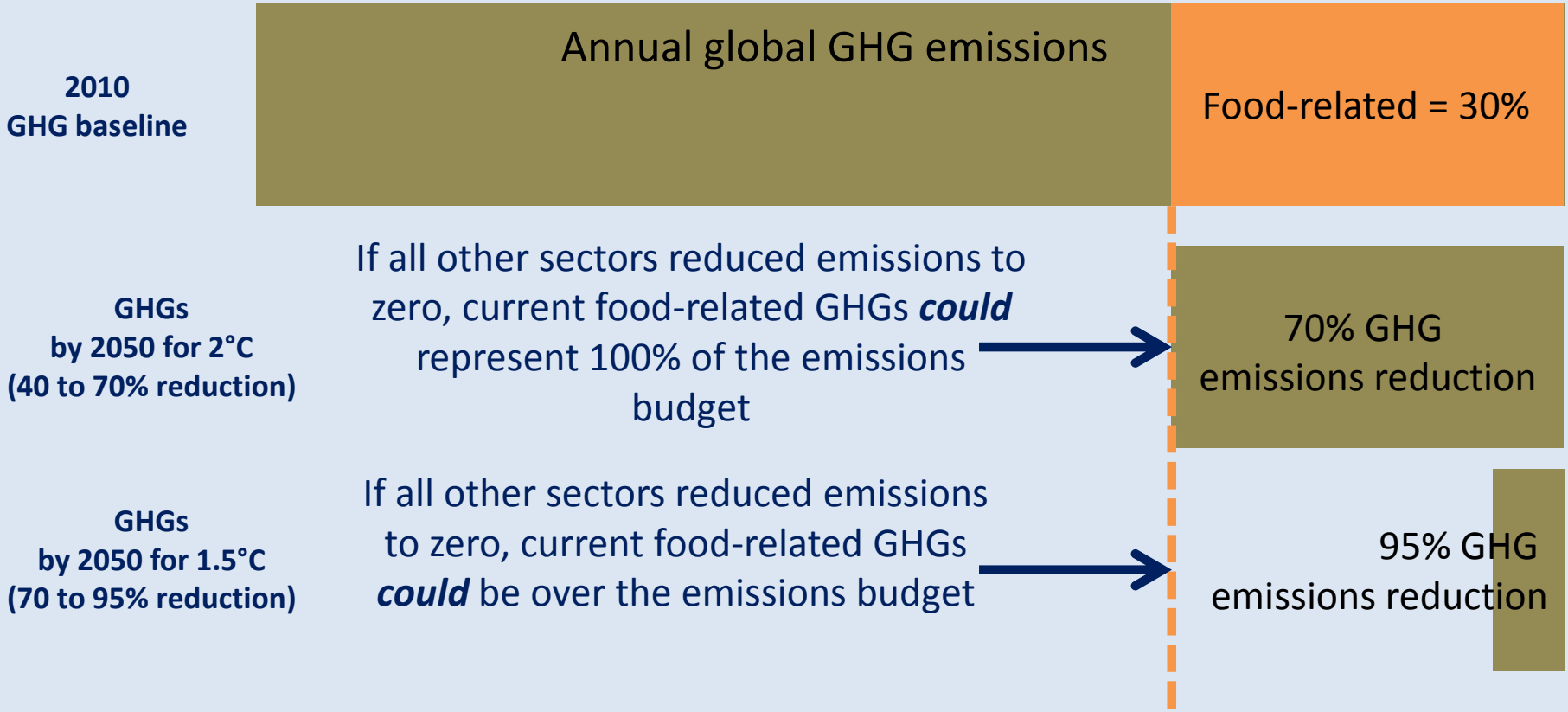
- Why is a focus on consumption needed?
- If we change our consumption patterns, can we cut GHG emissions?
- What happens to our dietary health?
- Is a focus on low GHG and healthy diets enough?...
- …What is a sustainable diet?
- What more do we need to know?

Global perspective – food systems contribute 20-30% of GHGs.



Estimates from Vermeulen, S. J. et al.(2012) Climate Change and Food Systems. *Annual Review of Environment and Resources*. 37. p.195-222.

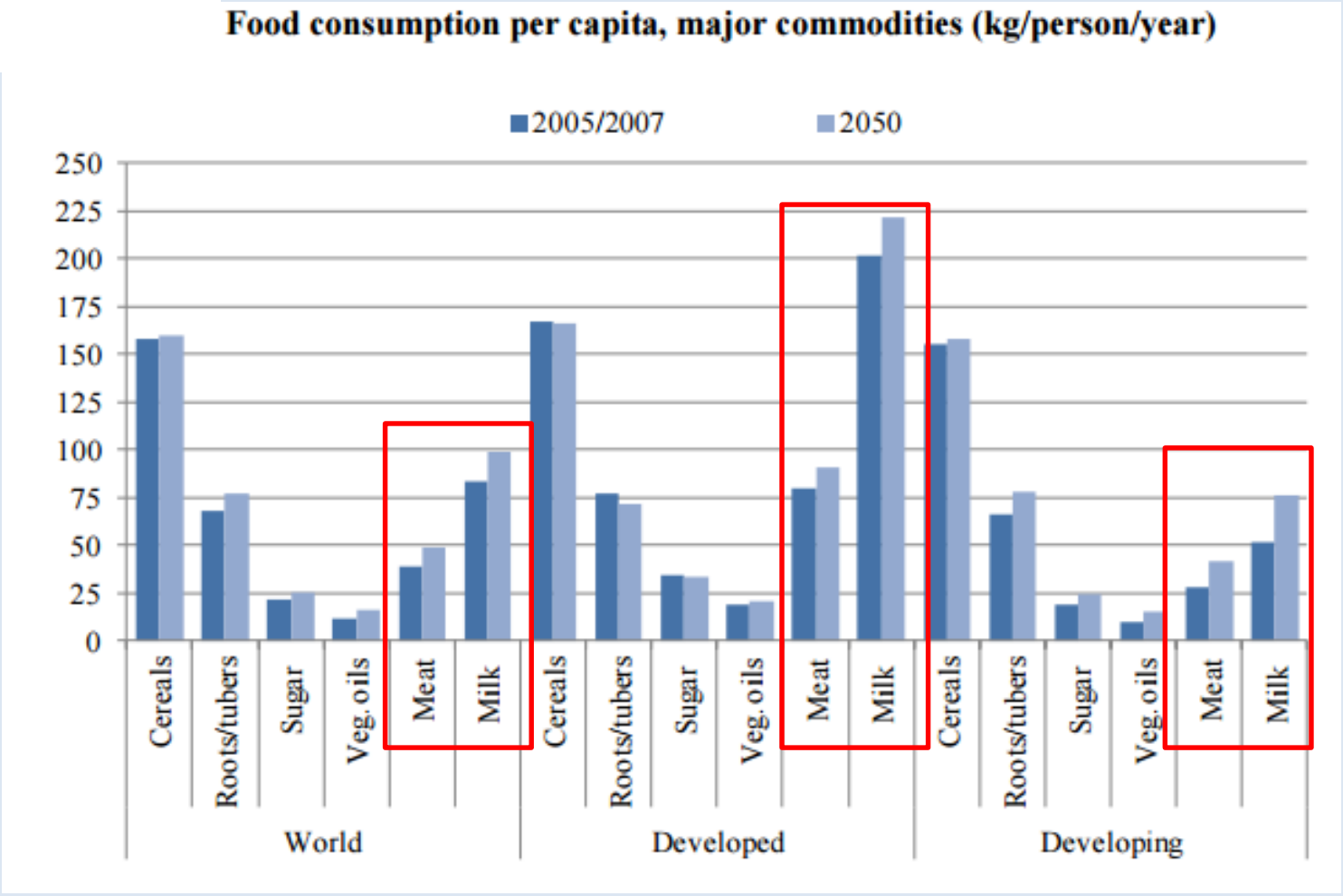
Paris – and food



Food ‘demand’ is expected to rise

if we don’t do anything about it

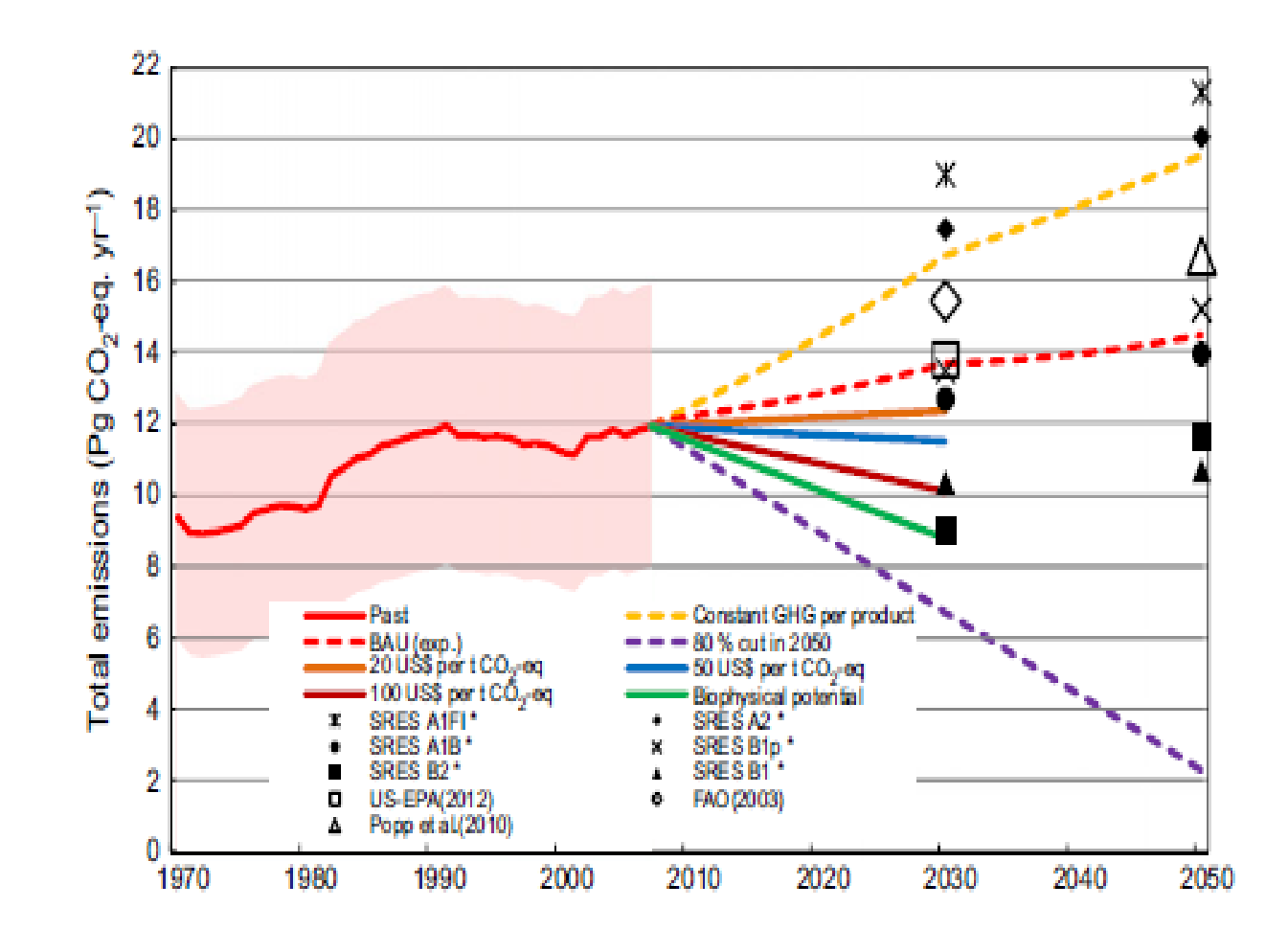
more people eating more



Alexandratos, N. and Bruinsma, J. (2012) *World agriculture towards 2030/2050: the 2012 revision*. ESA Working paper No. 12-03. Rome, FAO

Can production-side approaches alone do the job?

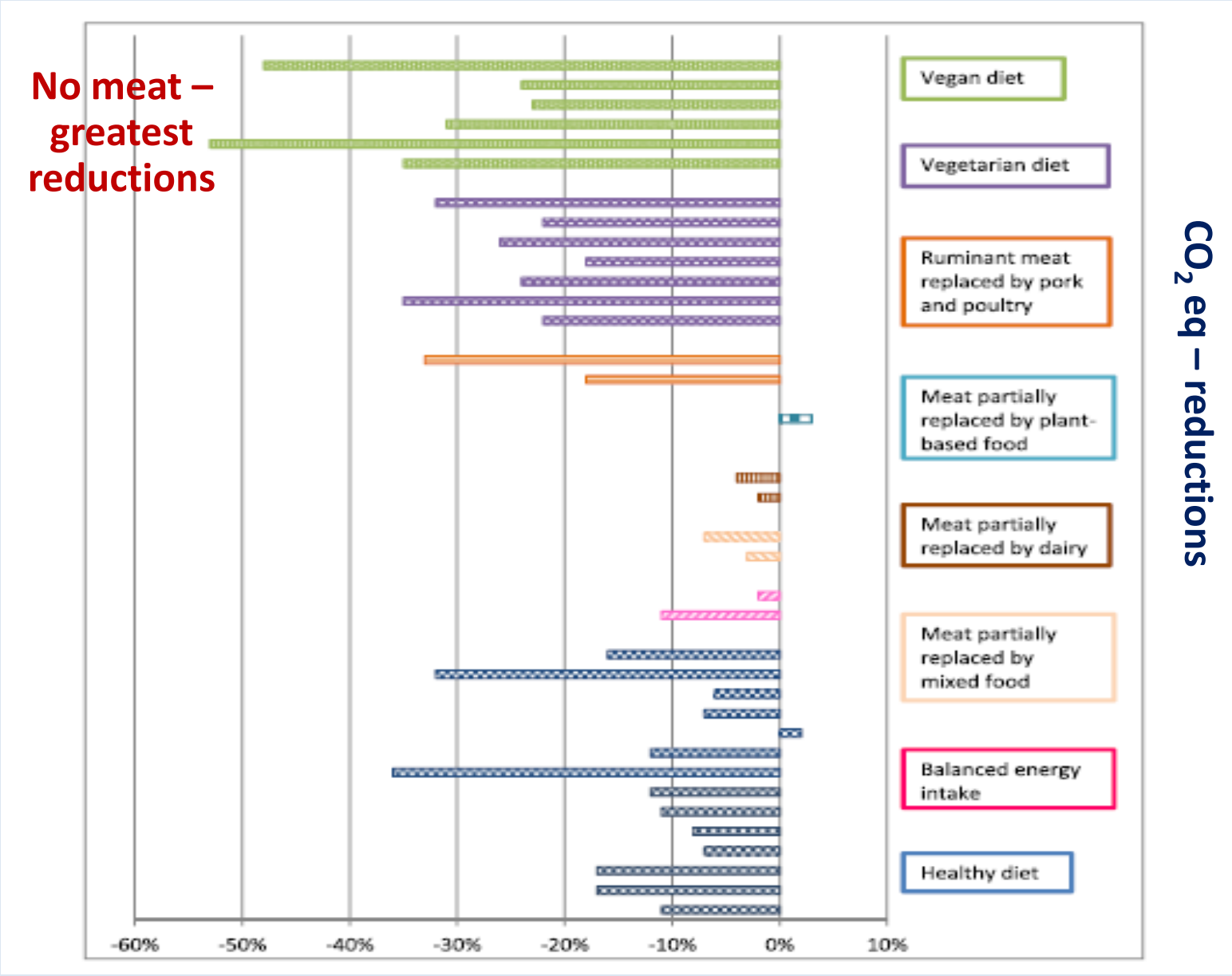
Range in estimated mitigation potential is enormous – risky to rely. Nothing gets you to an 80% cut.



Bennetzen E H, Smith P and Porter J R (2016). Decoupling of greenhouse gas emissions from global agricultural production: 1970–2050. Global Change Biology, 22, 763–781, Doi: 10.1111/gcb.13120

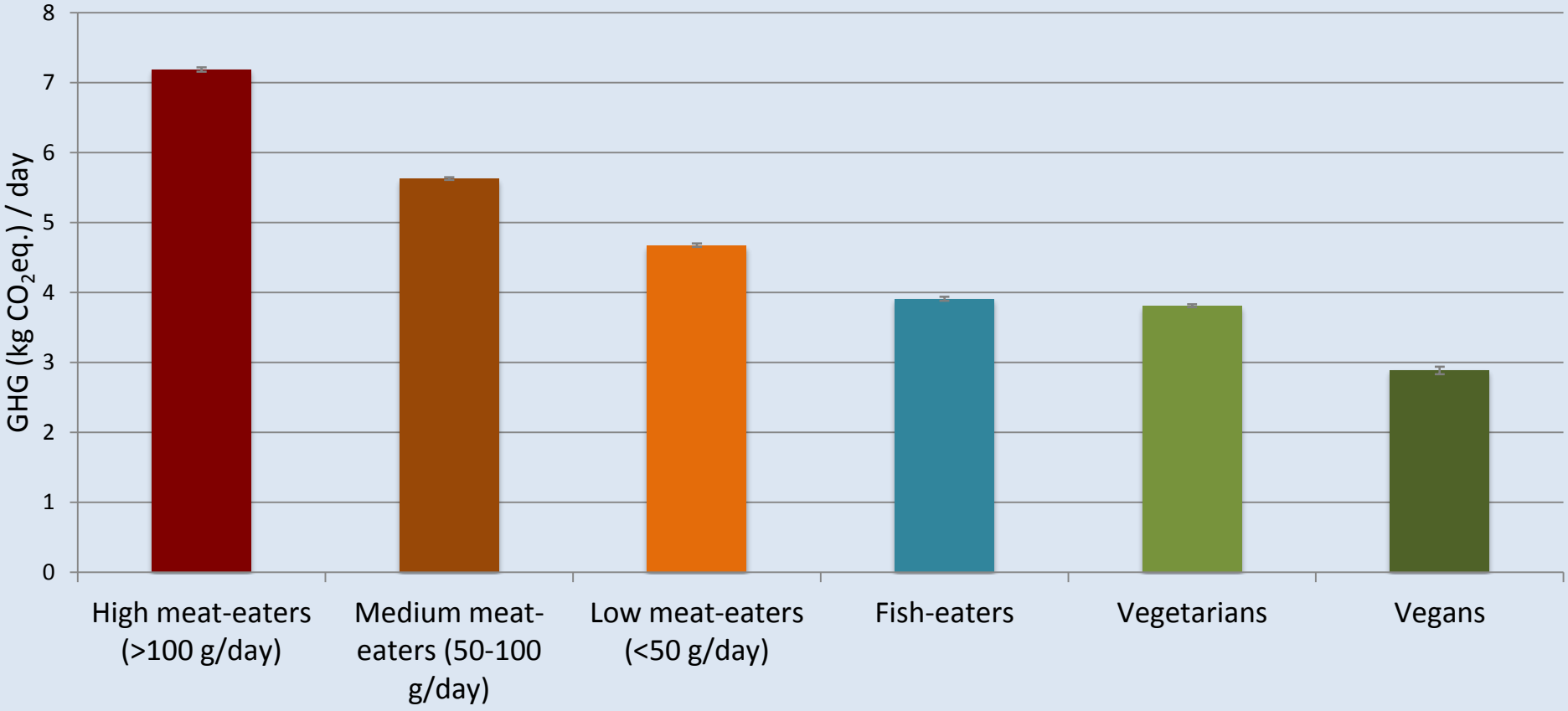
Can changing consumption lead to fewer GHGs?

A systematic review of studies shows GHG reductions are possible by switching to different diets



Hallström, E., Carlsson-Kanyama, A., and Börjesson, P. (2015). Environmental impact of dietary change: a systematic review. *Journal of Cleaner Production*, 91(0), 1-11

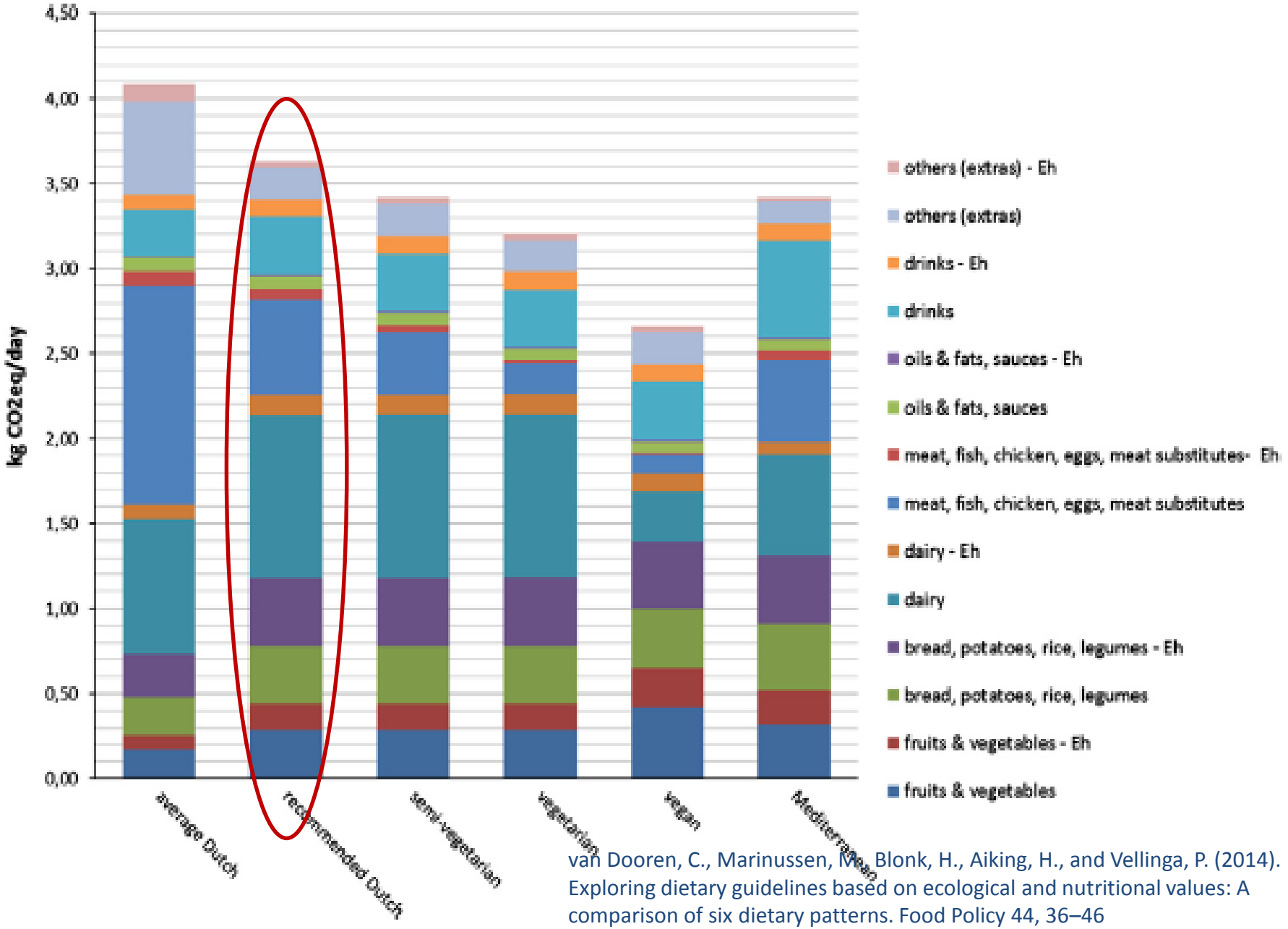
Real life non-meat diets have lower GHGs than various meat-based diets (UK example)



Scarborough, P., Appleby, P.N., Mizdrak, A., Briggs, A.D.M., Travis, R.C., Bradbury, K.E., and Key, T.J. (2014) Dietary greenhouse gas emissions of meat-eaters, fish-eaters, vegetarians and vegans in the UK. Climatic Change, 125(2), 179-192

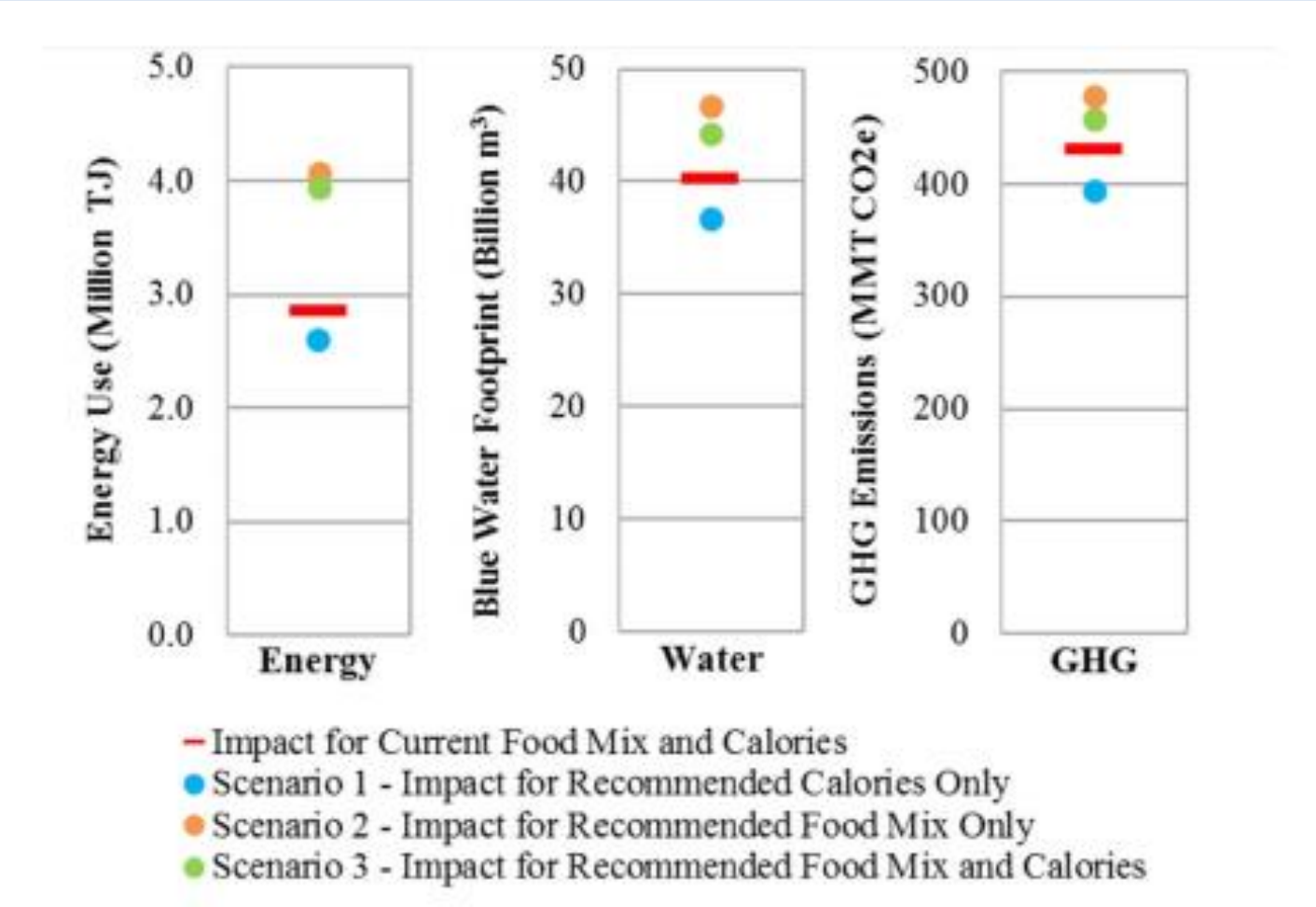
Do recommended healthier diets contribute to lower environmental impacts and vice versa?

Recommended Dutch diets have lower GHGs than average Dutch diets, but higher GHGs than balanced vegetarian, vegan or Mediterranean diets



van Dooren, C., Marinussen, M., Blonk, H., Aiking, H., and Vellinga, P. (2014). Exploring dietary guidelines based on ecological and nutritional values: A comparison of six dietary patterns. Food Policy 44, 36–46

But potential for increase in impacts depending on the recommendations: USA as an example



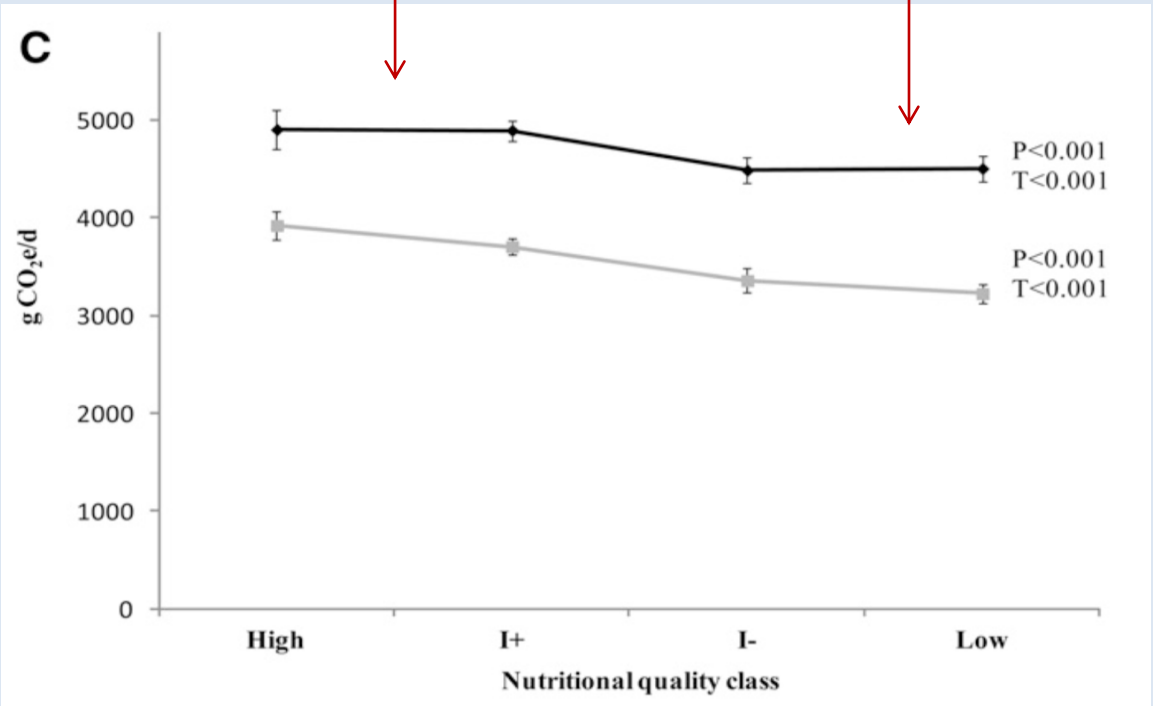
USDA recommends high dairy, more fish, high fruit

Tom, M. S., Fischbeck, P. S., Hendrickson, C. T., (2015). Energy use, blue water footprint, and greenhouse gas emissions for current food consumption patterns and dietary recommendations in the US, Environment Systems and Decisions, DOI: 10.1007/s10669-015-9577-y

French study – some real life healthier diets can have higher GHGs than unhealthy diets

Healthier diets had higher GHGs, due to consumption of certain meats & dairy (both having high GHG) and some types of fruits.

Low nutrition diets had lower GHGs, due to higher consumption of sugary foods (sugar has low GHG).



Black line = males
Grey line = females

Vieux, F., Soler, L.-G., Touazi, D., and Darmon, N. (2013). High nutritional quality is not associated with low greenhouse gas emissions in self-selected diets of French adults. Am J Clin Nutr;97:569–83

Nevertheless large cuts in GHGs while meeting nutritional criteria are possible - UK

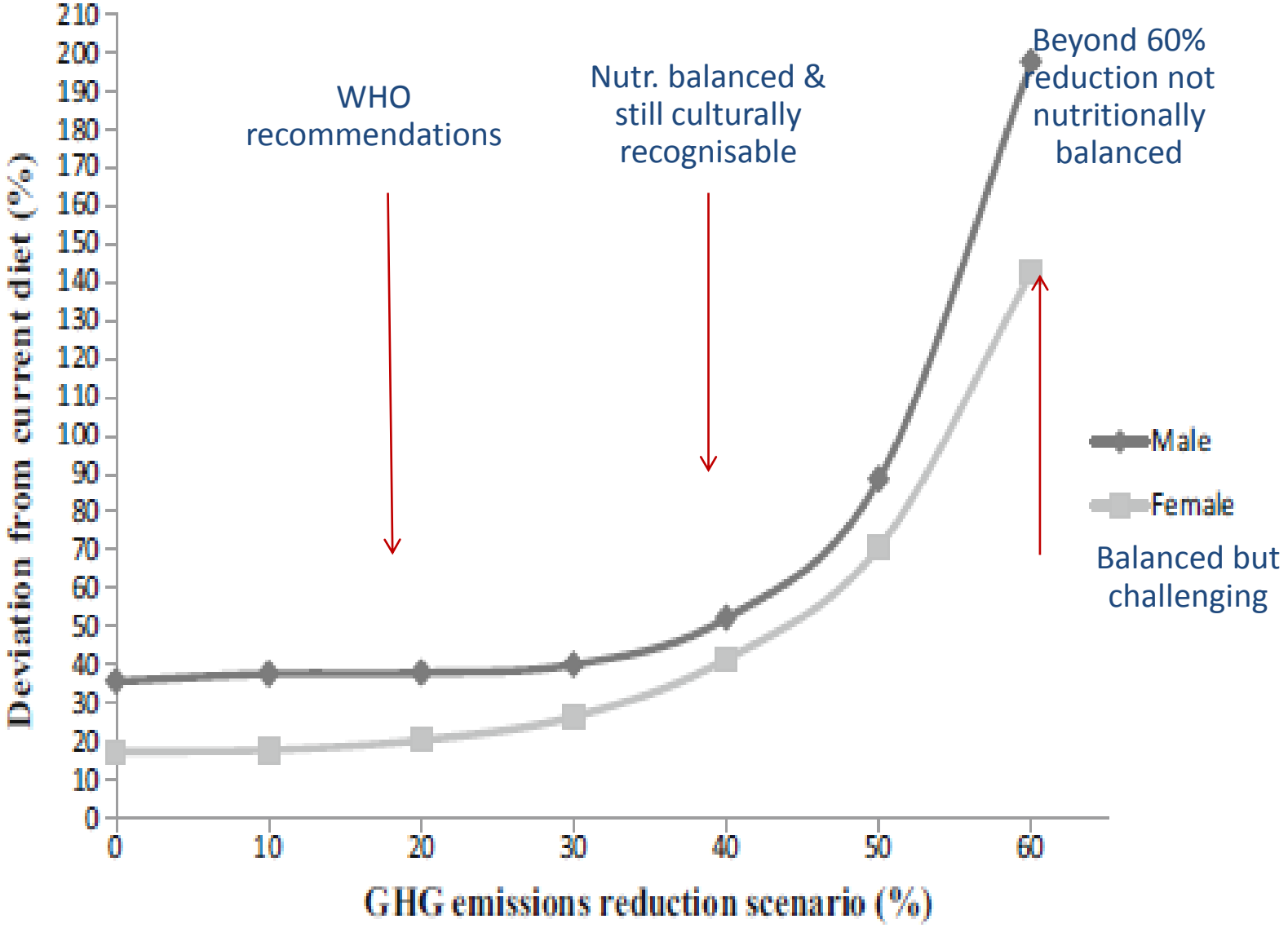
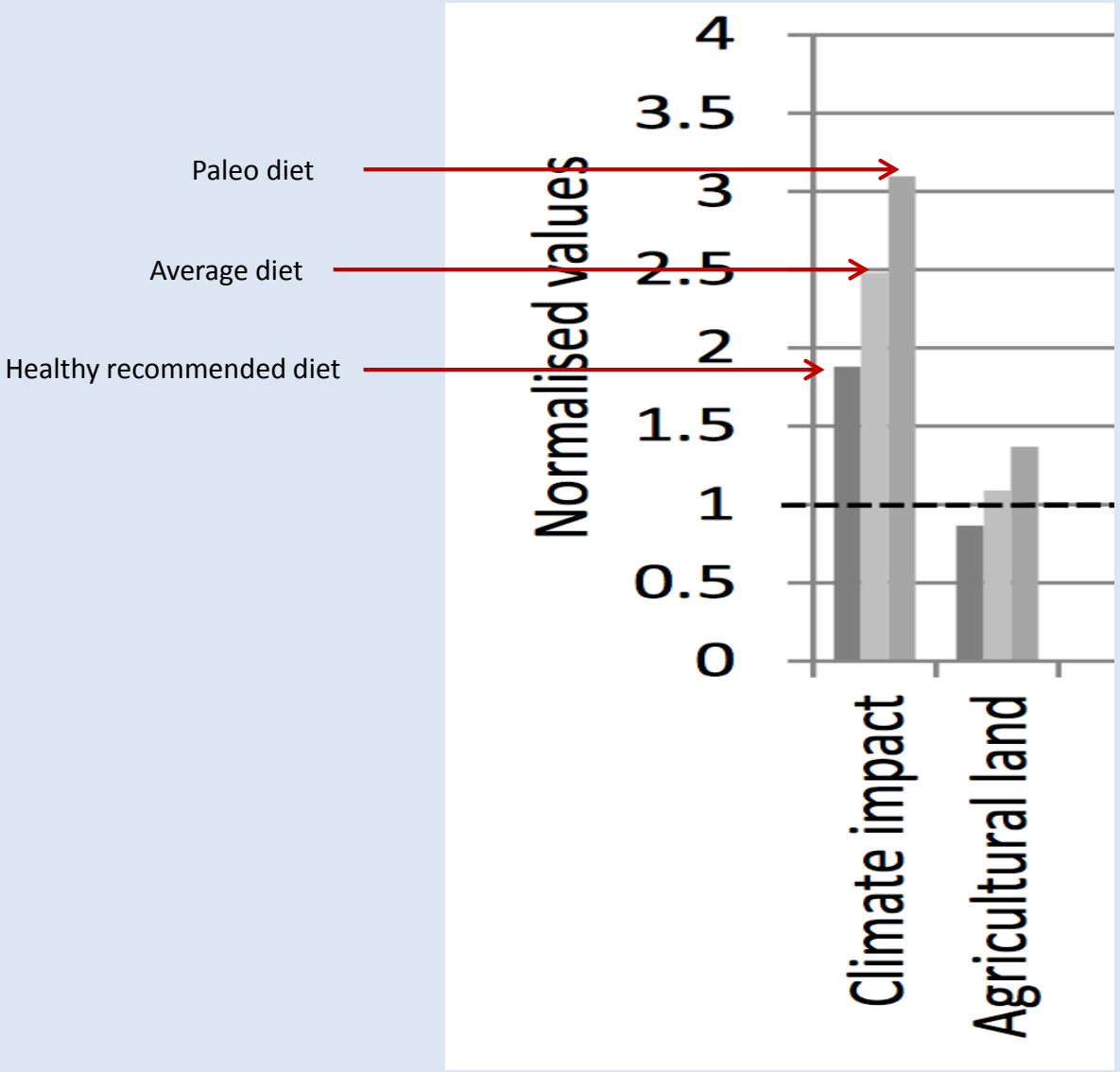


Fig. 3 Deviations of optimised diets from current average diet, with associated reduction in greenhouse gas

Although a focus on diets alone without improving production as well will also not be enough

If we each have an annual per capita GHG emissions of 1-2 tonnes, and food were assumed to account for 50%, then a recommended healthy diet would still exceed allowable GHG limits – even if better than the average Swedish alternative.



Röös, E., Karlsson, H., Witthöft, C., & Sundberg, C. (2015). Evaluating the sustainability of diets–combining environmental & nutritional aspects Environmental Science & Policy, 47:157-166

So…

Can result in higher impact

Existing diet

Healthier dietary mix, healthy calorie intake, but:

- moderate meat
- high in dairy
- high in fruit & veg grown in greenhouses or airfreighted

Healthier dietary mix, healthy calorie intake, and:

- low meat
- moderate dairy
- high in legumes and pulses
- high in seasonal field grown, robust veg and fruit

Or lower impact

Can we draw any conclusions so far?

- Current diets - high environmental impacts & often not healthy.
- Healthy diets not automatically lower in GHGs
- BUT win wins are possible
  - i.e. diets better than now and lower in emissions

Healthy low GHG diets – an arranged marriage, not a love match

Lower impact but unhealthy

- Mainly grains (except rice), tubers & legumes
- Low in nutrient rich foods e.g. fruits, vegetables & animal products
- Lacking diversity
- Low waste & energy but high risk storage & cooking practices

Poor in poor countries

Healthy & lower impact

- Eat enough – but not too much
- Eat more tubers, whole grains, fruit and vegetables (mainly field grown, resistance to spoilage, and not requiring energy-intensive transport).
- Eat meat sparingly if at all - and all of it
- Dairy products in moderation or fortified replacements
- Unsalted seeds and nuts
- Small quantities of fish, from certified sources
- Limit processed foods high in fats, sugars and salt
- Don't waste food & cook efficiently

Better?

High impact & unhealthy

- High in animal products
- Low in vegetables and fruits
- Low in grains & tubers
- High in energy & fat dense, nutrient poor processed foods
- High waste & inefficient cooking

Rich & emerging economies

Healthy but high impact

- Moderate levels of lean meats
- High impact vegetables and fruits (e.g. air freighted produce & hothoused 'ratatouille' vegetables & salads
- Fish consumed from unsustainable stocks
- Chilled fresh food produce
- Inefficient cooking & high waste

The wealthy healthy

But that's not really a **sustainable** diet

Towards 'sustainable' eating patterns

FAO definition of sustainable diets

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

What does this look like on a plate?

How might we measure SHEPs?

Dimensions of sustainability	How can we measure them?
Environmental (including climate change, water use and pollution, fossil fuel use, air pollution, land use change and biodiversity loss)	Some covered by environmental life cycle assessments (LCA) and by evolving work on water footprinting, but not all.
Food security (availability, access, utilisation, stability)	Food security indicators available and evolving.
Nutrition	Energy, protein, fat, zinc, calcium, iron etc.; nutrient density indicators; health outcomes (non-communicable diseases).
Livelihoods, jobs and economic development	May include incomes, the retail price index, working conditions, contribution to GDP. Evolving metrics, some certification schemes exist. Social LCA is an evolving research area
Animal welfare	Some certification schemes exist, but different opinions exist as to what constitutes good welfare in different contexts.
Culture	Preferences, cultural norms, religious beliefs ……Very under-researched and under-considered area in relation to sustainability

Trade-offs can be numerous…e.g.

- Between **health and the environment**:
  - Eating more of certain fruit and vegetables may be good for health but bad for water stress in some cases.
  - Food processing can improve resource efficiency (e.g. sausages) but at a cost to health (e.g. due to the addition of salt and use of fattier cuts).

- **Between environmental impacts**:
  - Some fish have a lower GHGs than meat but more fish consumption could put extra pressure on fish stocks and marine biodiversity.
  - Switching from ruminant meat to poulty reduces GHG emissions but increases reliance on prime arable land.

- **Between environmental impacts and social and economic aspects** of sustainability. For example:
  - Livestock intensification may reduce GHG per kg/output but undermine animal welfare.
  - Reducing livestock production may harm jobs, livelihoods and erode cultures and traditions

Important research priorities remain

- Sustainability metrics that go beyond GHGs, water and land use
- How might future changes in production methods influence demand or changes in the health-environmental relationship of certain foods?
- How might different assumptions about the role of grazing livestock in sequestering soil carbon alter our conclusions about the role of ruminant meat in SHEPS?
- How might changes in production or consumption in one country trigger changes in consumption or production in another (via imports and exports)?
- How will climate change itself impact upon food production –yields but also nutritional quality?
- What sustainable and nutritionally adequate dietary pathways might be appropriate for low income countries?

And in any case, how do you change consumption patterns?

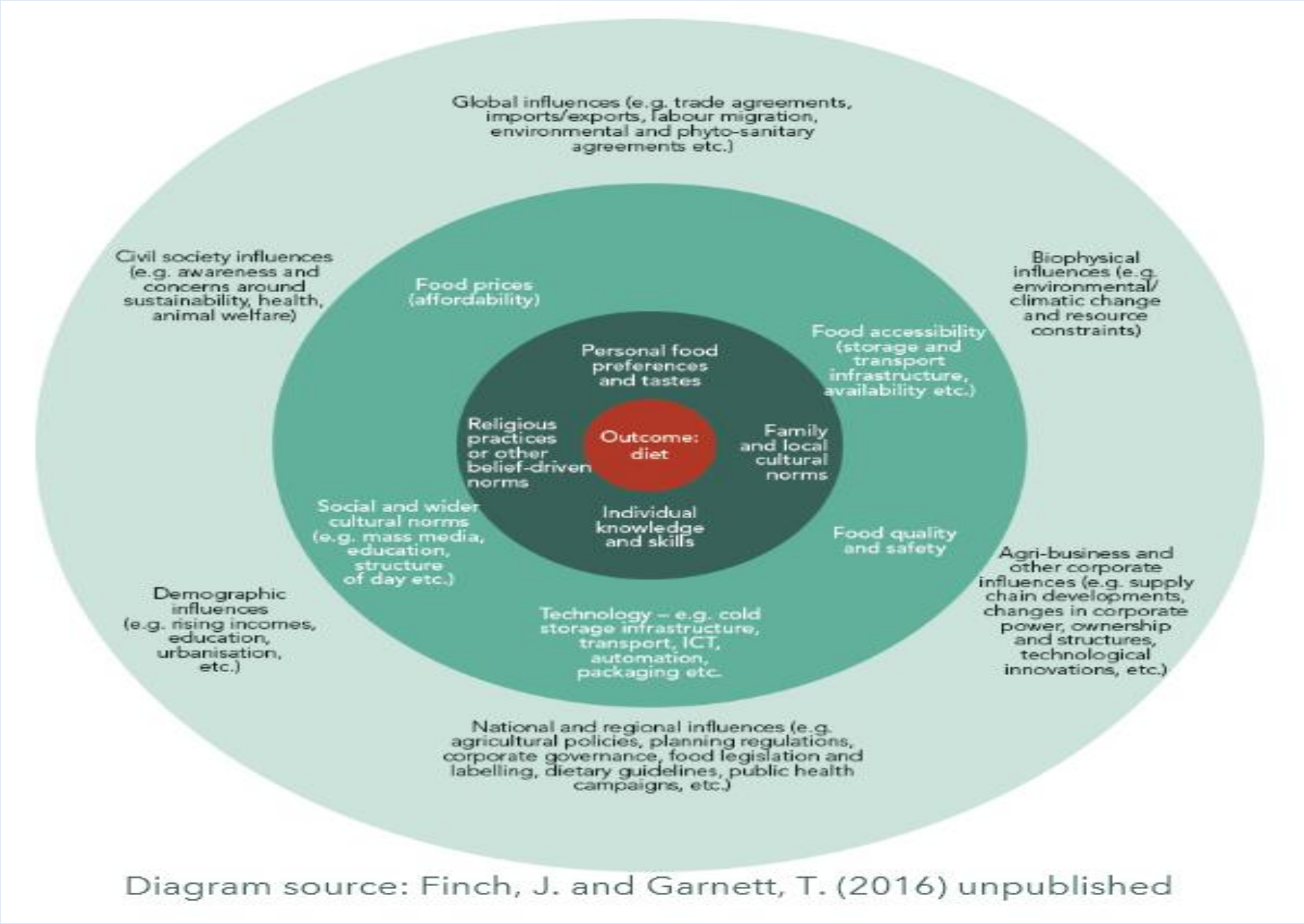


Diagram source: Finch, J. and Garnett, T. (2016) unpublished

A few suggestions

- Don’t assume you can’t change things
- Spend more on social sciences
- Think beyond the label

All approaches needed

	Approach	Examples
1	Restrict, eliminate or incentivise choices through economic measures	Taxes, subsidies, trading
2	Change governance of production or consumption	Macro economic policies and agreements, national public procurement and planning policies, other regulations
3	Encourage collaboration and shared agreements	Voluntary industry agreements, certification schemes
4	Change the context, defaults and norms of production or consumption	Changing the choice architecture, nudge, store layouts, catering provision etc..
5	Inform, educate, promote or empower through community initiatives, labelling and other means	Labelling, gardening or cooking projects, media or other campaigns, education programs

Thank you

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taragarnett@fcrn.org.uk