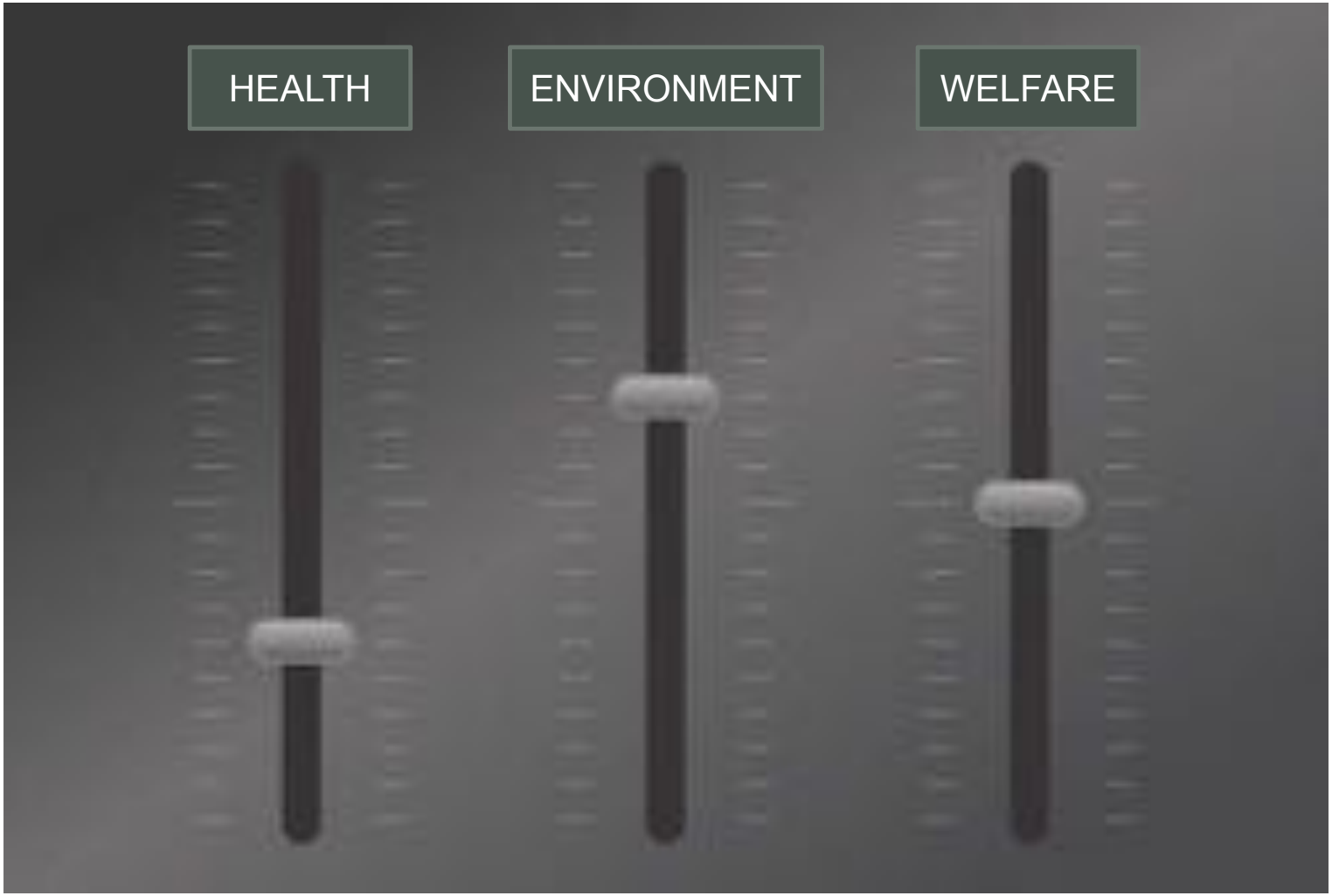
MEAT TAX: A GLOBAL NUTRITION PERSPECTIVE

Food Policy on Trial
Food Ethics Council
May 2019

Jody Harris

Institute of Development Studies

Priorities?



NUTRITION AND HEALTH

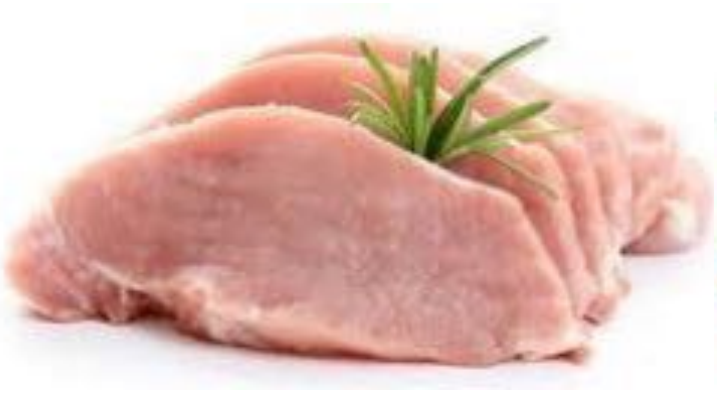
Requirements: Protein and micronutrients

World Health Organisation 2007: Protein and amino acid requirements in human nutrition;
EAT-Lancet report 2019: Healthy diets from sustainable food systems

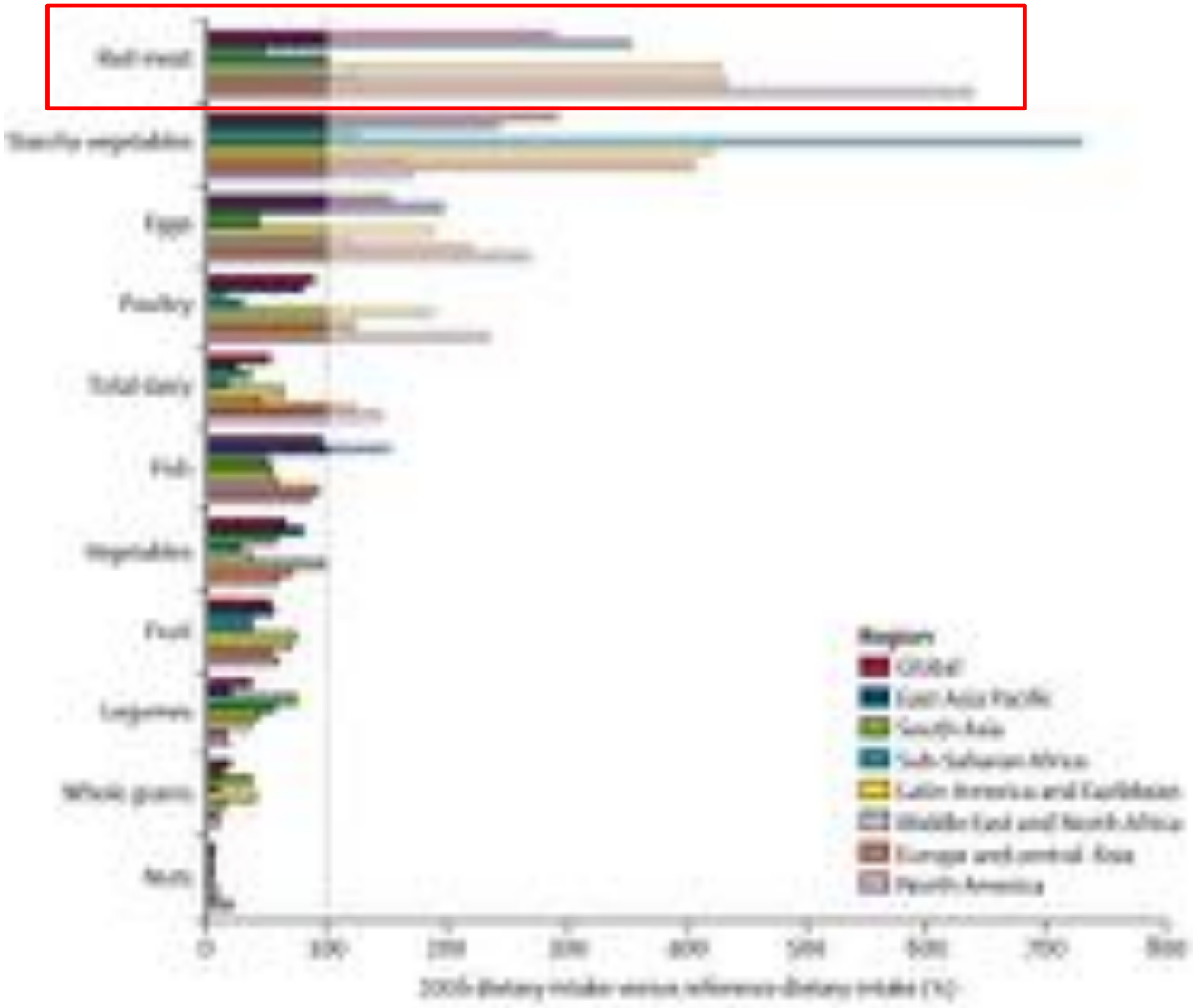
The good… the bad… and the ugly

- Minimally processed meat: high in protein and micronutrients; saturated fat
- Processed meat: higher in salt, fat; higher mortality and CVD
- Ultra-processed meat: multiply processed; obesity, CVD, cancers

Monteiro et al 2016: NOVA classification;
EAT-Lancet report 2019



THE GLOBAL PICTURE

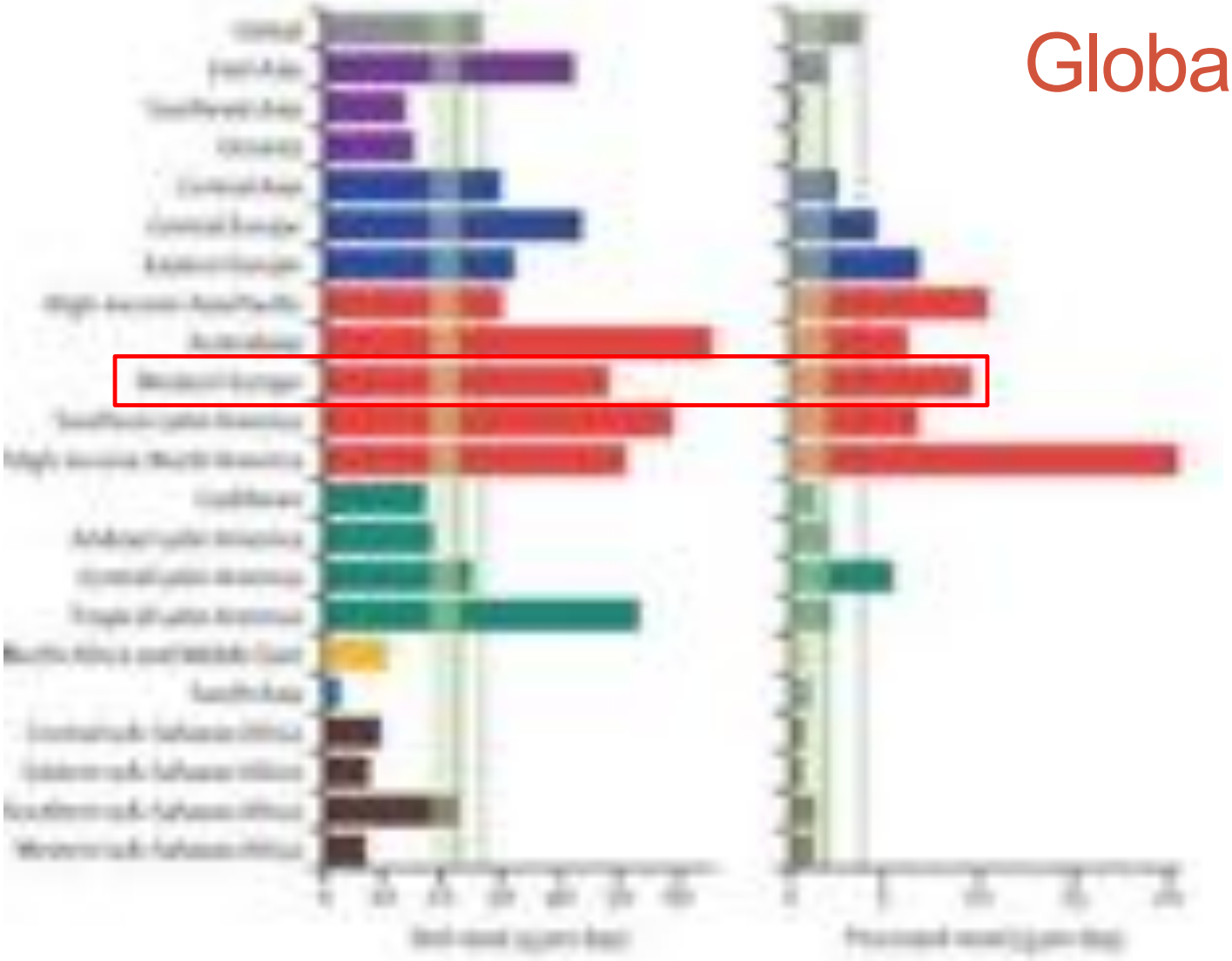


Healthy diet?

EAT-Lancet commission report 2018

Global meat intakes

Global burden of disease study 2019

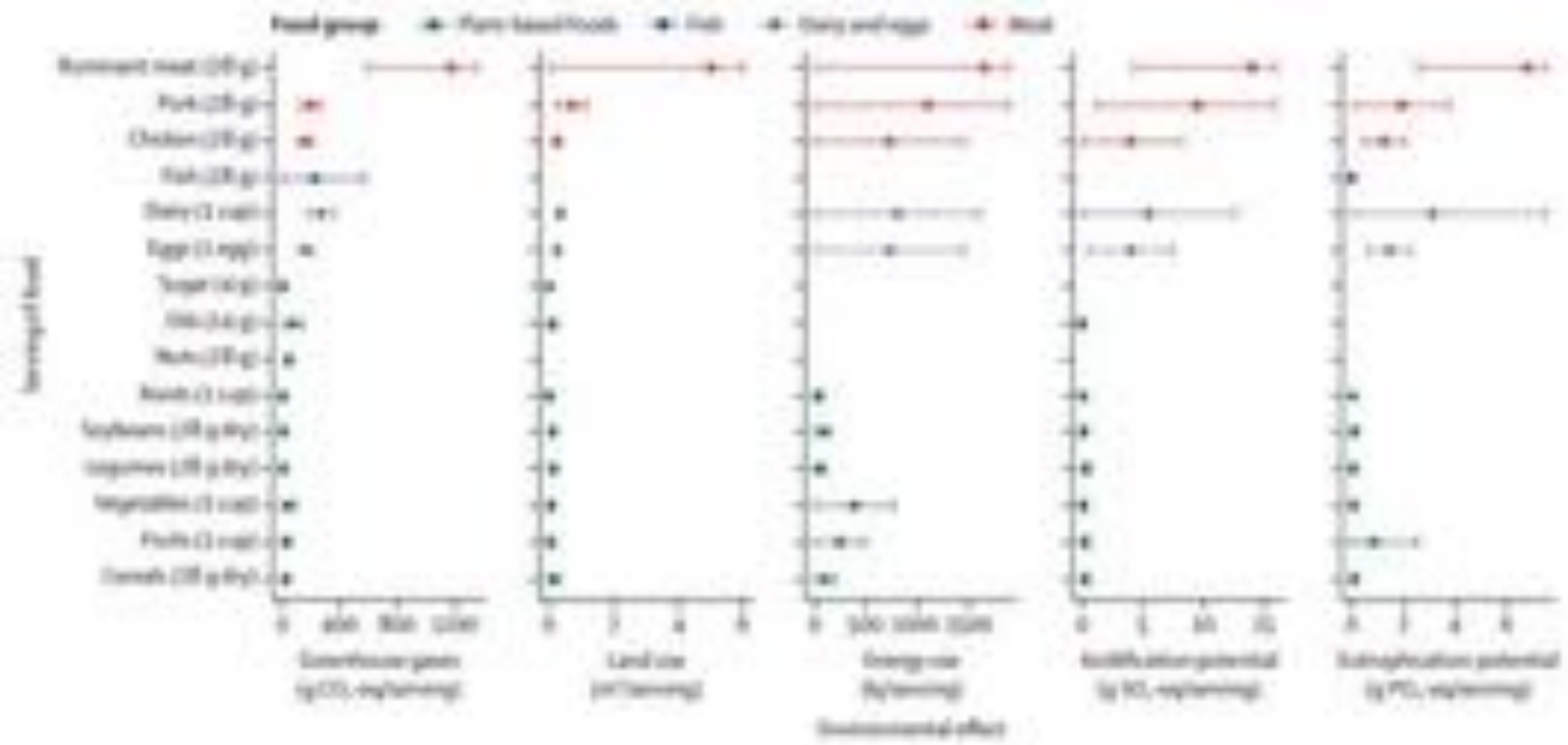


- - - - - Global average

——— High level

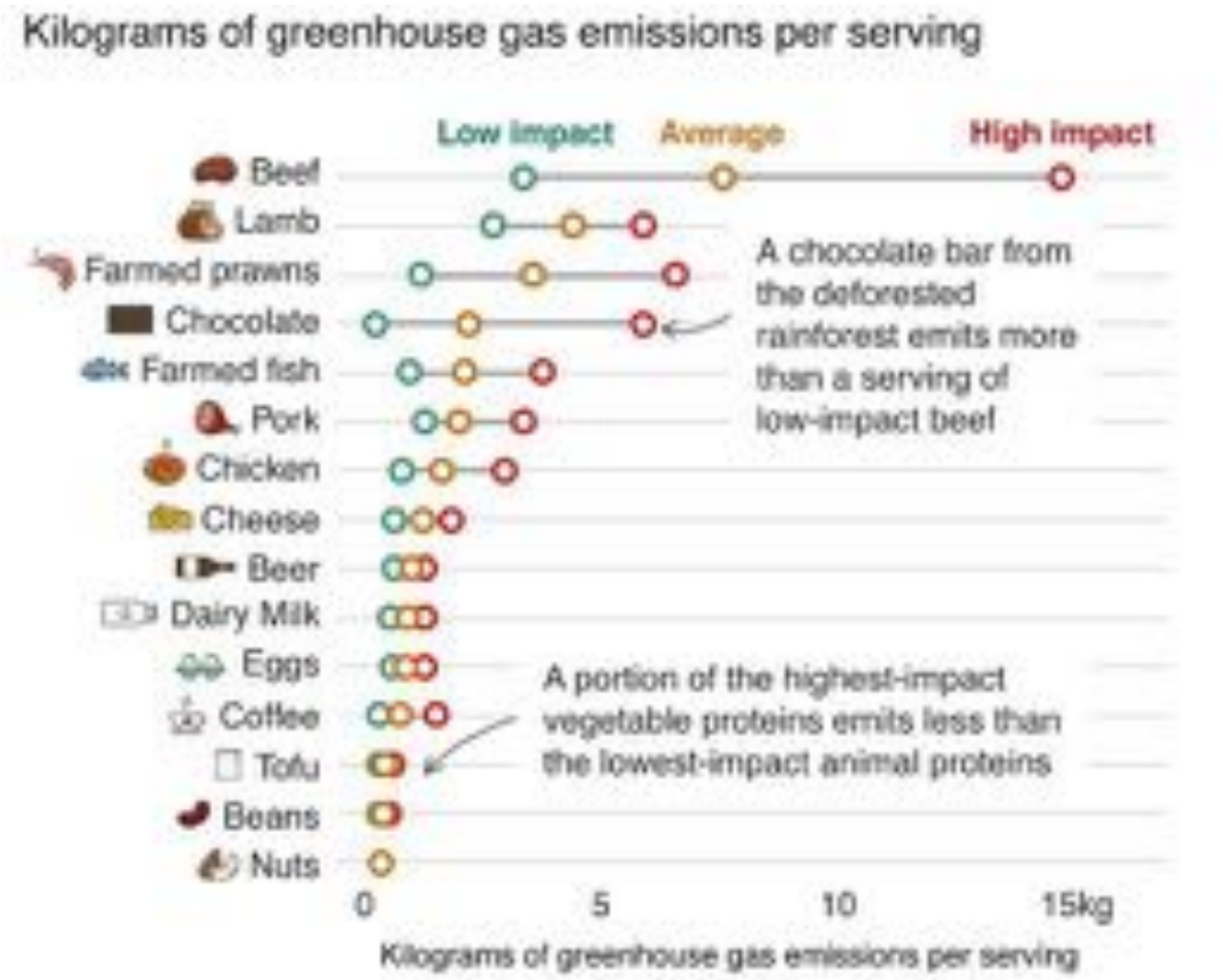
Environmental impacts

EAT-Lancet commission report 2018



Meat production

Poore and Nemecek 2018

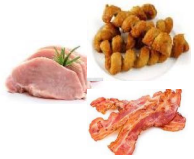


Health and environment evidence

All people are not the same in their nutrient requirements

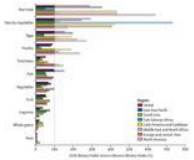
- Meat provides key nutrients in a small package, for growing children in particular

– but it is not necessary in the diet if other alternatives are available and affordable



All meats are not created equal in their association with health

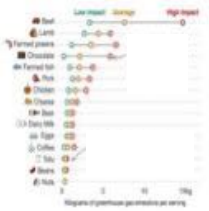
Type of meat matters for health: ultraprocessed; processed; unprocessed; or red or white, for instance



Inequality in meat consumption is high across the world

- The UK falls into the category of those needing to reduce meat consumption overall

  – but needs to be balanced with making sure everyone can afford nutrients they need



Meat in general has a higher environmental footprint than plant foods

- But type of meat and where and how it is produced matters
- For environment as well as animal welfare

POLICY CONSIDERATIONS

Global meat tax: health impacts

Springmann et al 2018

Price change with tax

Red meat:

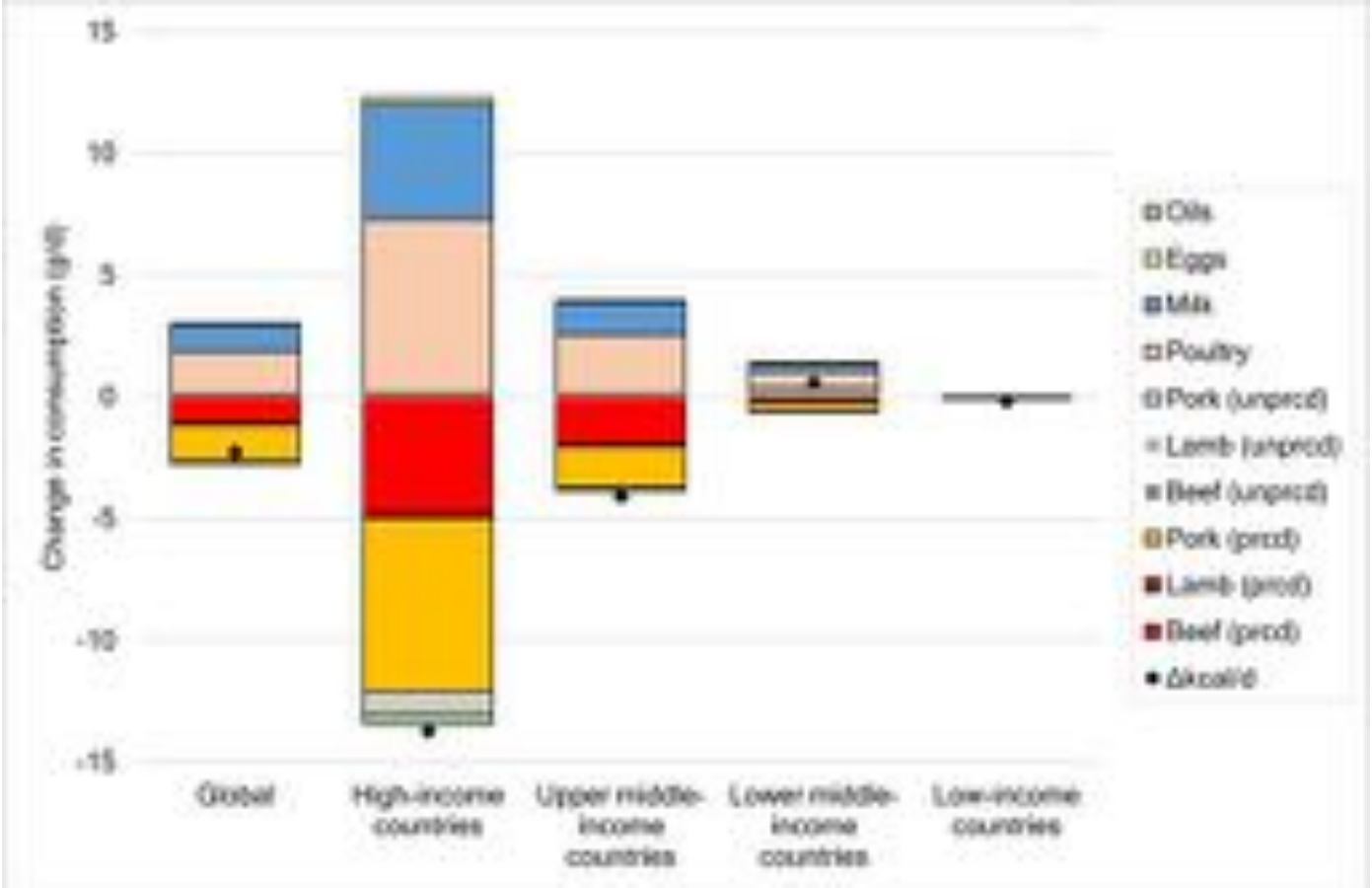
- UK: 13.6%

- High income: 21.4%
- Low income: 0.2%

Processed meat:

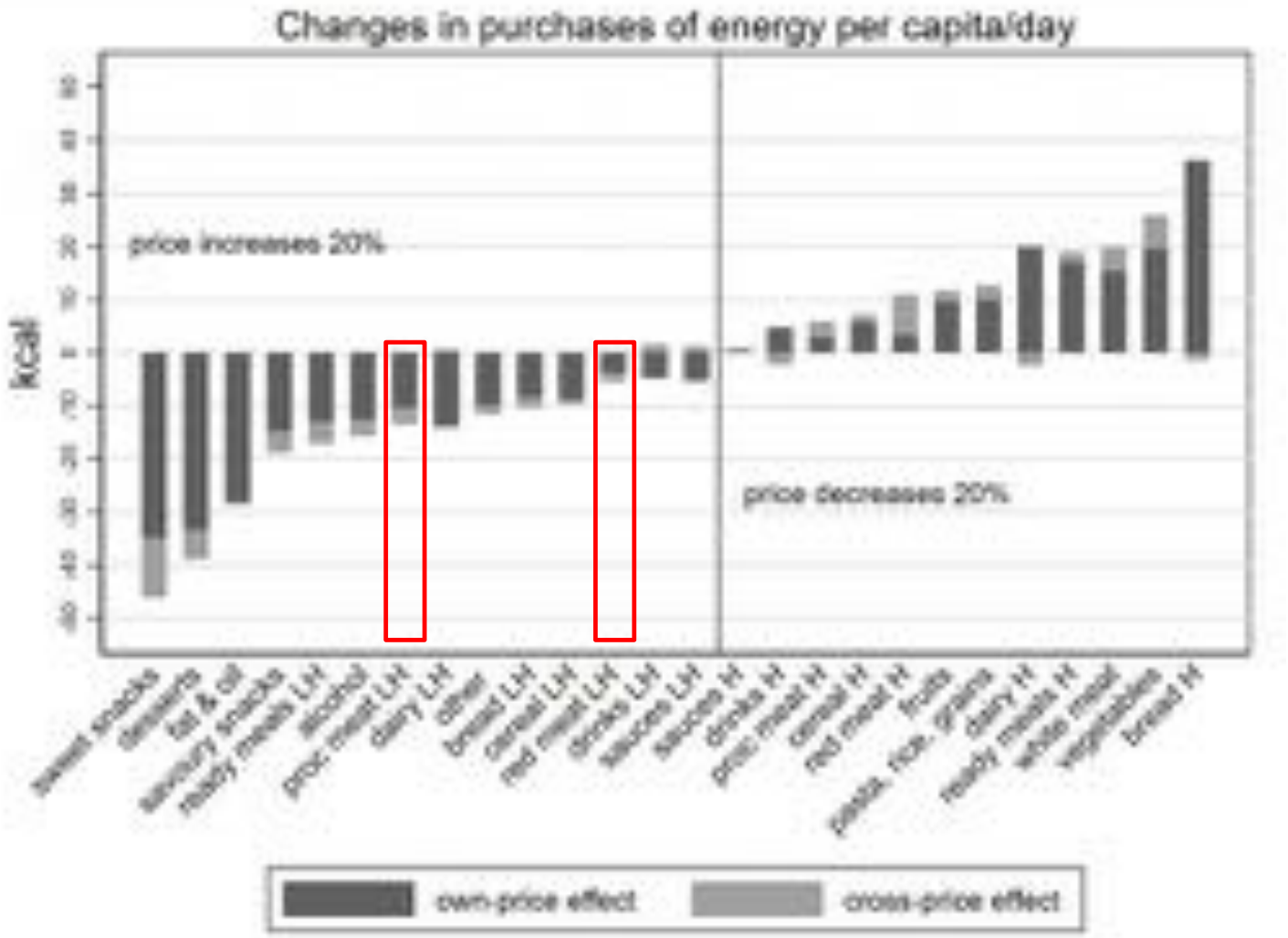
- UK: 78.9%

- High income: 111.2%
- Low income: 1.3%



Meat tax in the context of other food taxes

Cornelsen et al 2018



Policy options

EAT-Lancet commission report 2018

Jody Harris

j.harris@ids.ac.uk

@justjody23

Centre on Population Approaches for Non-Communicable Disease Prevention.
Nuffield Department of Population Health

UNIVERSITY OF OXFORD

Arguments for a meat tax

Mike Rayner

Food Policy on Trial, Food Ethics Council, May 2019

WHO Collaborating Centre
on Population Approaches for Non-Communicable Disease Prevention

Declaration of interests

The Centre will not accept funding from producers, manufacturers or retailers of: food and drink…

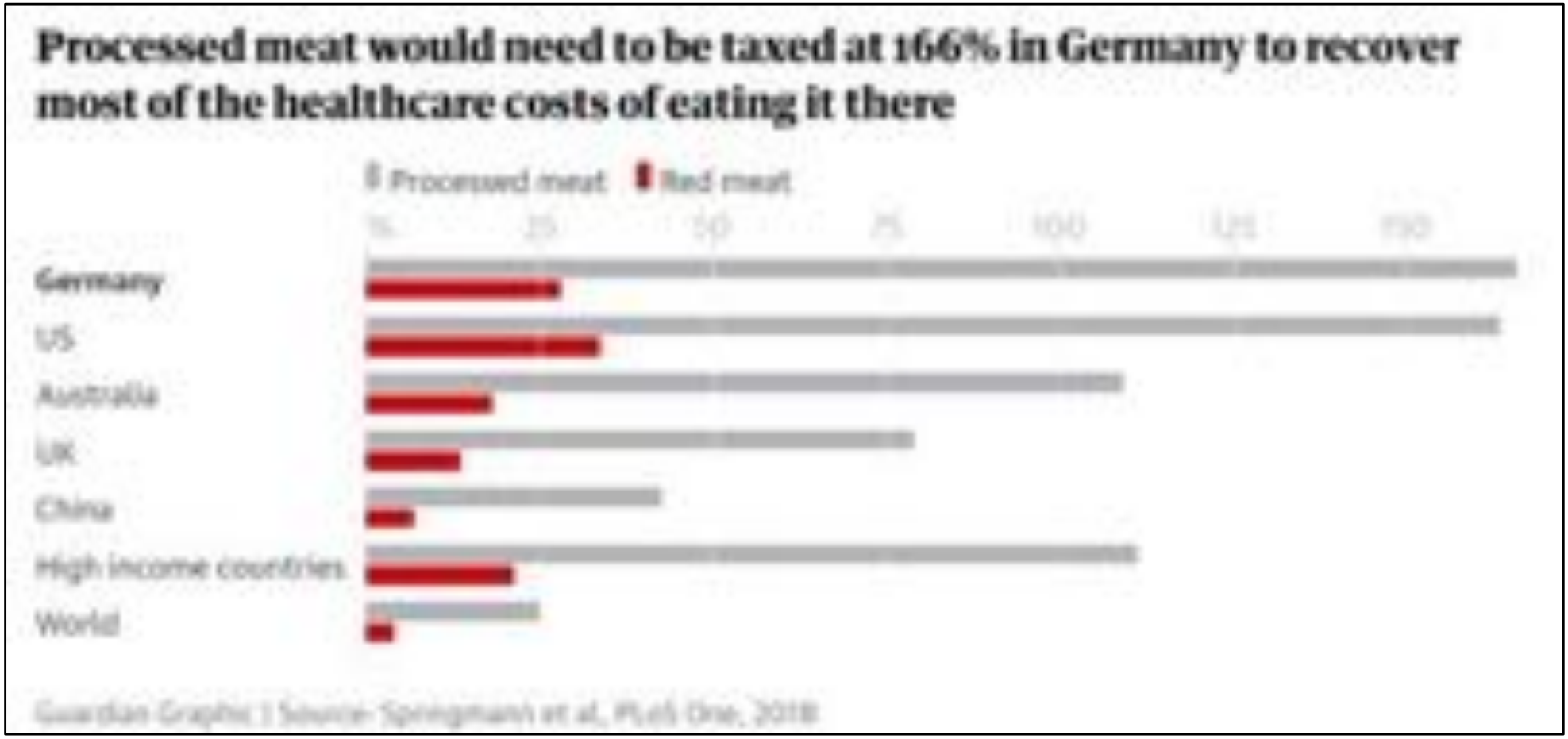
http://www.ndph.ox.ac.uk/bhfcpnp/about/what-we-do/funding-policy-updated-aug-2015.pdf

My argument

- There is an urgent need to reduce the consumption of red and processed meat consumption in the UK for health and environmental reasons.
- Price is an important determinant of consumption.
- Food taxes are worth considering as a means of increasing the price and thereby reducing the consumption of unhealthy and unsustainable foods.
- We now have good evidence that food taxes can help to improve human health (c.f. the case of the UK sugary drinks tax).
- Meat taxes are inevitable given the climate emergency.
- We need to design a meat tax which is:
  - effective (i.e. quite large)
  - fair (to both producers of meat whose production methods are more environmentally sustainable and to poor consumers)
  - practical

History of the UK SDIL

- 29th January 2000 — Marshall's 'Exploring a fiscal food policy: the case of diet and ischaemic heart disease
- 11th Nov 2006 — Mytton et al's 'Could targeted food taxes improve health?'
- 3rd Sept 2015 — Jamie Oliver's 'Sugar Rush'
- 16th March 2016 — Tax announced
- 18th April 2018 — Introduction of the tax:



Springmann M, Mason-D'Croz D, Robinson S, Wiebe K, Godfray HCJ, Rayner M, et al. (2018) Health-motivated taxes on red and processed meat: A modelling study on optimal tax levels and associated health impacts. PLoS ONE 13(11): e0204139. https://doi.org/10.1371/journal.pone.0204139

If a tax on meat..

- What point in the food chain?
  - Farmers, manufacturers, retailers, consumers
- Just meat or meat and dairy?
- What species of meat?
  - Beef, lamb, pork, chicken
- Should the tax be regardless of production methods
- How much should the tax be?

If not a tax on meat..

- A tax on inputs that reduce the sustainability of meat product (e.g. nitrogen fertilisers)
- Reduced subsidies on meat production
- Subsidies for the production or consumption of alternatives to meat

A meat tax needs to be

- Effective (i.e. quite large)
- Fair to
  - producers of meat whose production methods are more environmentally sustainable
  - poor consumers
- Practical

The problem with taxing meat

Richard Young

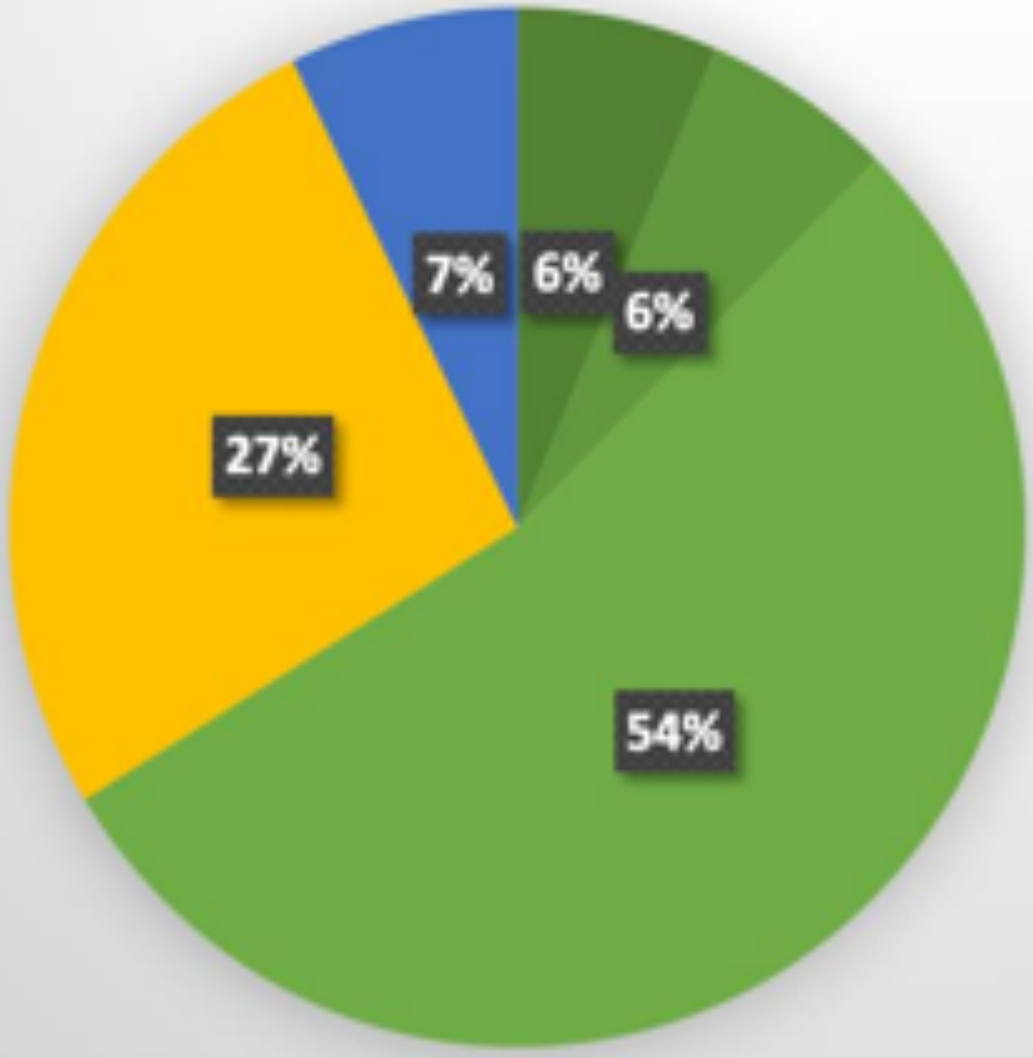
Sustainable Food Trust

Food Policy on Trial: Meat Tax
Food Ethics Council Debate
23 May 2019, London

Meat Tax Studies

- Wirsenius, Hedenus and Mohlin, 2011: considered only GHG emissions; EU in scope
- Springmann et al, 2017: considered GHG emissions and diet-related disease; global in scope
- Springmann et al, 2018: considered only diet-related disease; global in scope
- None of these studies examined impacts on biodiversity, chemical inputs, soil health or water quality, so we only get a very narrow and incomplete picture of what constitutes healthiness/sustainability
- No consideration of specific issues relating to the UK: e.g. 66% of farmland under grass, mostly for environmental and agronomic reasons; climate and soils in much of the UK unsuitable for crop production; meat and fats from grass-fed animals superior to grain-fed animals

UK Farmland, 2017 (% of total agricultural area)



- Common rough grazing
- Temporary grassland
- Permanent grassland
- Cropland
- Other

Study limitations

- The associations between red meat consumption and disease **not proven and causal** (Springmann et al, 2018 based their assertion on just 4 studies). Evidence on processed meat stronger, but causal factor(s) still unclear
- Impacts of a meat tax on food substitution were examined in Springmann et al, 2018, but they **could not discount the possibility of a shift to more damaging consumption patterns** (e.g. more sugar, refined carbohydrates and, one could add, palm oil)
- No consideration was given to the fact that **environmental impact and micronutrient quality vary enormously with production system**, e.g. extensive grass vs. intensive grain; organic vs. non-organic; species-rich pasture vs ryegrass monoculture

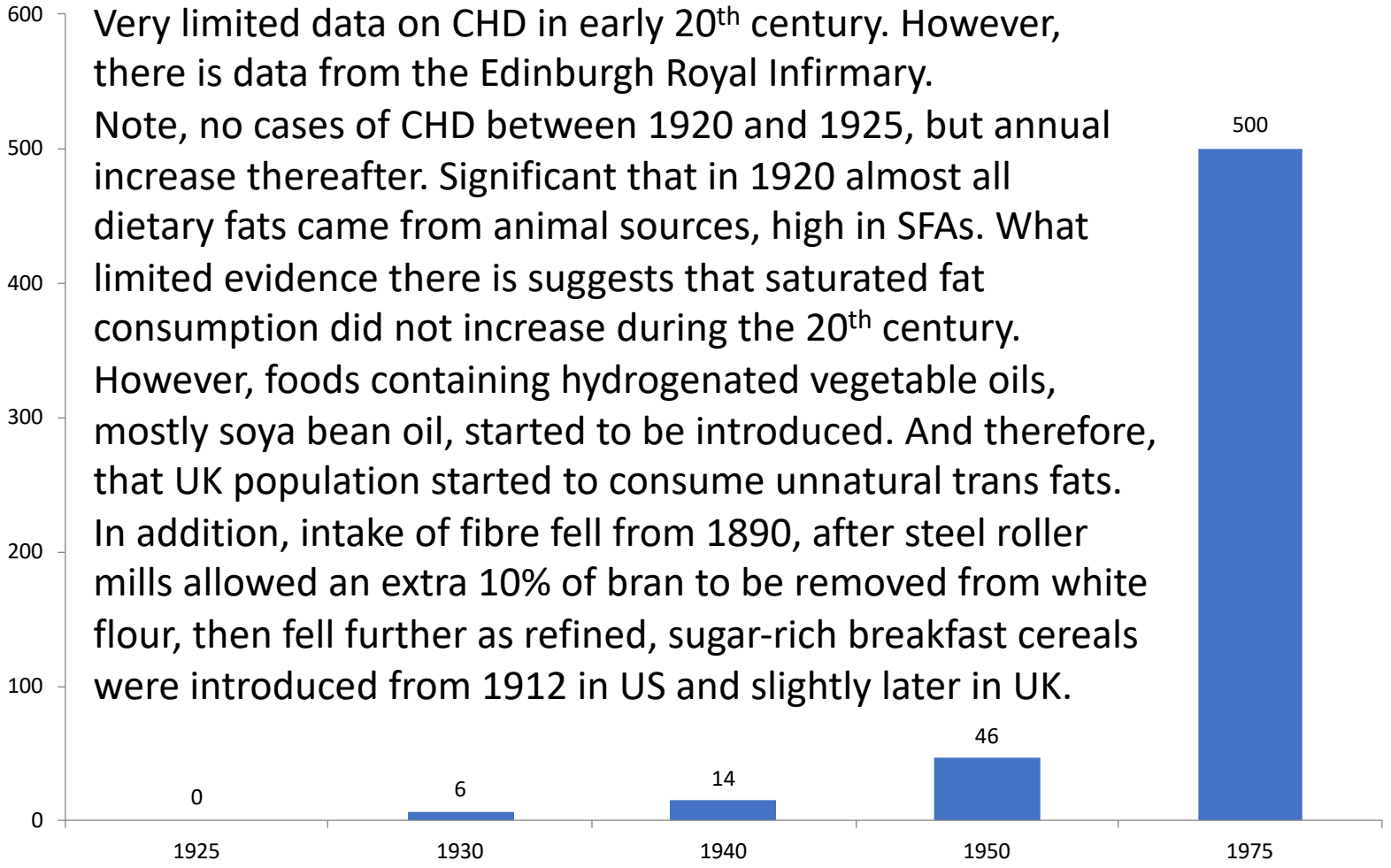
Red meat and disease – conflicting evidence

- Associations between unprocessed **red meat and CHD, stroke, diabetes, colorectal cancer NOT proven** or causal; evidence contradictory
- Two research teams[1] have found **red meat reduces risk of mortality when part of a balanced diet**
- Intensive chicken and fish often put together. Production methods vary
- Theoretical case that high chicken consumption could increase dementia risk. Not yet explored

1. Lee et al. 2013 and Dehghan et al. 2017

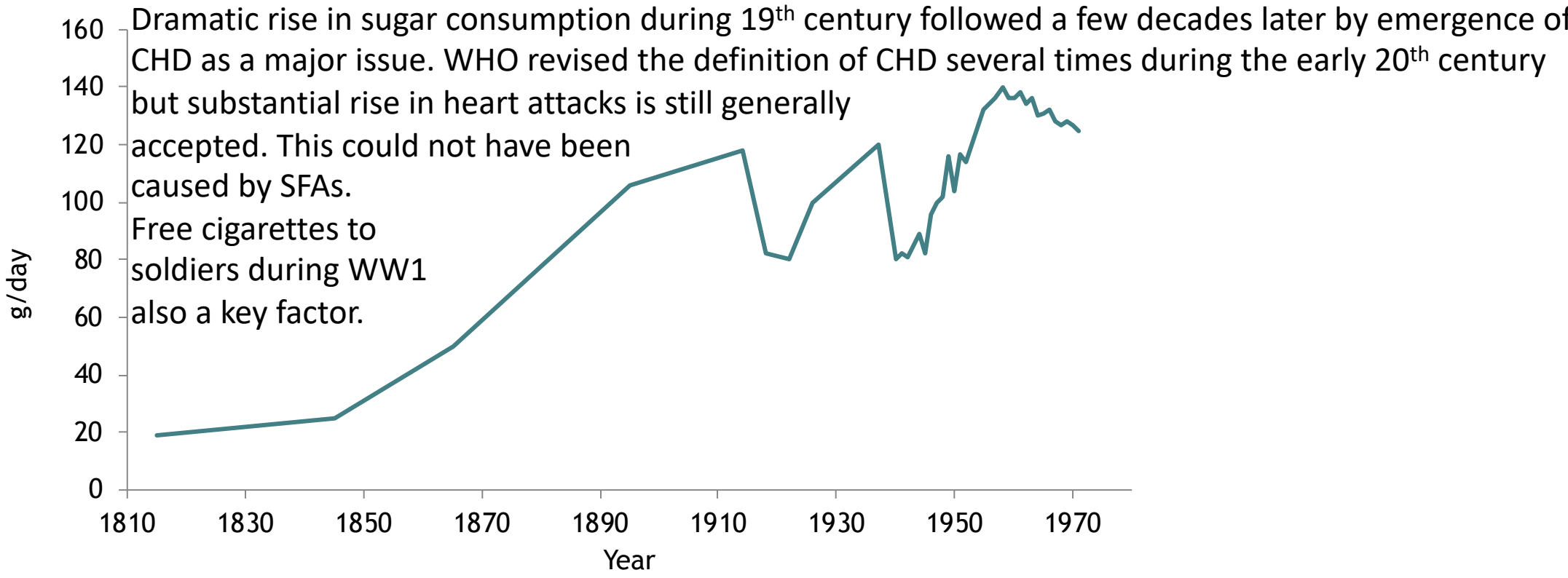
CHD cases per year at the Edinburgh Royal Infirmary

Very limited data on CHD in early 20th century. However, there is data from the Edinburgh Royal Infirmary.
Note, no cases of CHD between 1920 and 1925, but annual increase thereafter. Significant that in 1920 almost all dietary fats came from animal sources, high in SFAs. What limited evidence there is suggests that saturated fat consumption did not increase during the 20th century.
However, foods containing hydrogenated vegetable oils, mostly soya bean oil, started to be introduced. And therefore, that UK population started to consume unnatural trans fats.
In addition, intake of fibre fell from 1890, after steel roller mills allowed an extra 10% of bran to be removed from white flour, then fell further as refined, sugar-rich breakfast cereals were introduced from 1912 in US and slightly later in UK.



Sources: Dr Rae Gilchrist, 1971. ERI, and R. M Marquis, Smith, Kline and French, Cardiovascular Forum (Swann Press 1979), cited by Dr Walter Yellowlees, 1993, A Doctor in the Wilderness

Refined sugar availability, UK 1815-1970



Source: Diet and Coronary Heart Disease (1974), DHSS

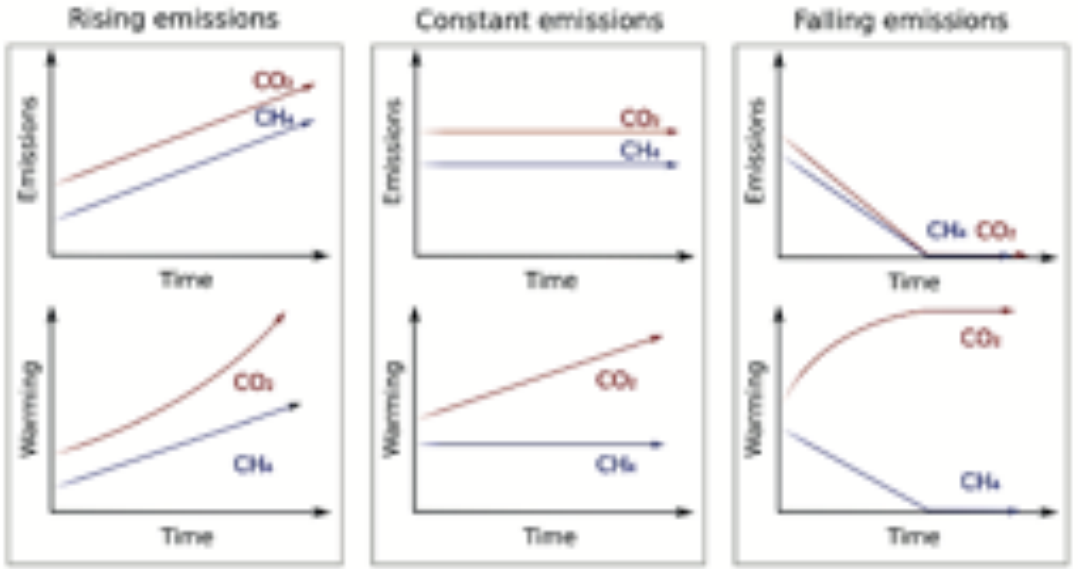
Saturated fat – recent analysis

- “The total body of evidence suggests that attention should be shifted from the harmful effects of dietary SAFA per se, to the prevention of the accumulation of SAFA in body lipids. This shift would emphasise the importance of reducing dietary carbohydrate, especially carbohydrate with a high glycaemic index, rather than reducing dietary SAFA.” **Kuipers et al, 2011**
- “Current evidence does not clearly support cardiovascular guidelines that encourage high consumption of polyunsaturated fatty acids and low consumption of total saturated fats.” **Chowdhury et al, 2014**
- “In this cohort, substituting dietary linoleic acid in place of saturated fat increased the rates of death from all causes, coronary heart disease, and cardiovasucular disease” **Ramsden et al, 2013** **Note:** published results from the influential Sydney Diet Heart Study 1966-73 and the Minnesota Coronary Experiment 1968-73, both now known to have been incomplete, leading to seriously incorrect conclusions.

Red meat and GHG emissions

- Cattle and sheep numbers in the UK have fallen by more than 25% since the mid-1980s (Zayed, 2016)
- Using more accurate GWP* metric, falling sheep and cattle numbers in UK have actually contributed to a small cooling of temperatures, not a rise as suggested by the c.6% of total UK CO_2-equivalent emissions typically reported.

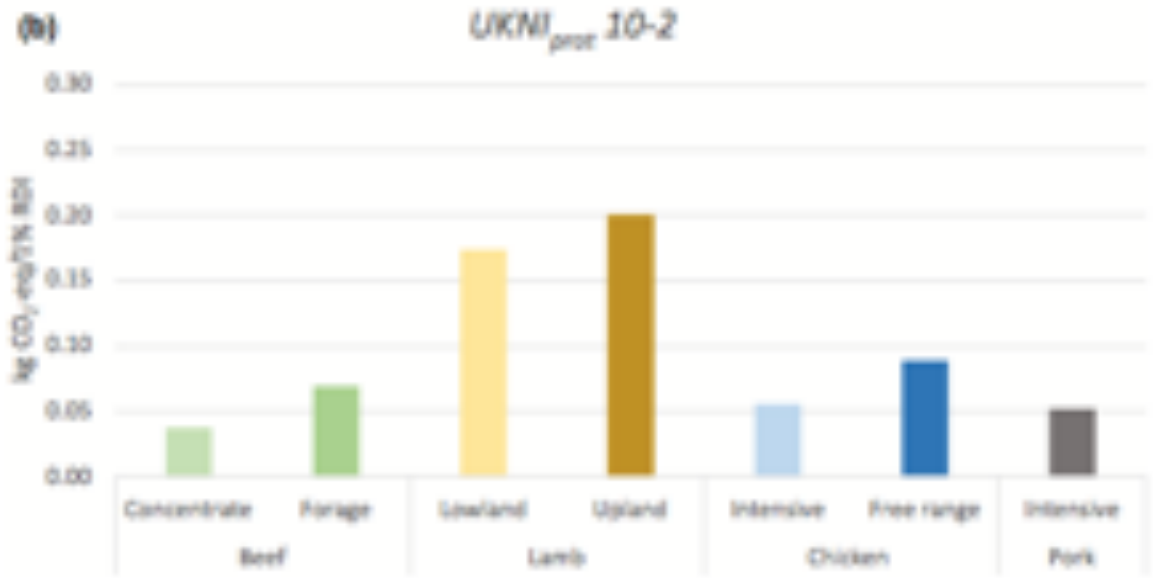
Sources: Oxford Martin School, 2017, Climate metrics under ambitious mitigation
See also Allen et al, 2018



Note: GWP^{100} does not fully account for the fact that CO_2 and N_2O persist in the atmosphere whereas methane breaks down to $CO_2 + H_2O$ after a decade.

Red meat and GHG emissions (cont.)

- When evaluating GHG emissions based on nutritional value instead of mass of meat, **grass-fed beef has a similar or better GWP^{100} compared to poultry and pork, [so GWP* even better].** (MacAuliffe, Takahashi and Lee, 2018).
- If other factors (e.g. welfare, biodiversity, river catchment management, soil erosion and water quality) are taken into account, **grass-fed beef may compare even more favourably.**



Source: MacAuliffe, Takahashi and Lee, 2018,

EAT-Lancet diet –nutritionally deficient

- **Vitamin B12** – RDA is 2.4ug, the EAT diet is slightly deficient in providing 2.27ug.
- **Vitamin A** - The EAT diet provides **just 17% of retinol** recommended, however it does contain enough carotene – although this is less bioavailable and conversion to retinol is poor
- **Vitamin D** – the EAT diet **provides just 5% of vitamin D** recommendation and some of that provided will have come from plants and not be D3, which is the body's preferred form.
- **Vitamin K** – It does not distinguish between K1 (primarily found in leafy green vegetables) and K2 (primarily found in fermented foods and some foods of animal origin). 72% of the vitamin K in the EAT diet came from the broccoli (K1). As is the case with all nutrients, the animal form (K2) is better absorbed by the body.
- **Sodium** – the EAT diet provides just 22% of the sodium recommendation. Sodium is so often demonised that people forget that it is a vital nutrient.
- **Potassium** – the EAT diet provides just **67% of potassium** recommended.
- **Calcium** – more seriously, the EAT diet provides **just 55% of calcium** recommended.
- **Iron** – the EAT diet provides **88% of iron** recommended and most of this is **not bioavailable haem Fe**

Source: Professor Michael Lee, Rothamsted Research & Bristol University, Pers. comm.

Shift to intensive poultry production

- Chicken consumption has increased greatly since 1950s, with recommendations for further increases (e.g. Committee on Climate Change, 2018)
- Chicken and pigs fed almost exclusively on grains and soya – production and imports of these would have to increase, with associated environmental issues and concerns around giving human-edible feed to livestock
- Overall, nutritionally inferior to grass-fed red meat (e.g. less B12, Zn and EPA+DHA)
- Welfare and antibiotic use issues

Source: Zayed, 2016

Potential impacts on UK livestock industry

- Traditional family farms would be unable to survive
- Only large-scale, intensive livestock systems would be viable – massive environmental, welfare and social change issues
- Most small abattoirs would close – greater meat miles, poorer welfare, impact on local economies, limited avenues for high quality, locally produced meat
- Large-scale conversion of pasture to deciduous woodland? Bad for grassland biodiversity. Could UK afford to fund loss of income for 300 years? Conifers more viable option, but only remove carbon for 4-5 decades before it is back in the atmosphere. Net benefit doubtful
- Pasture converted to grain production? Not feasible on most UK pastures, also c. 40% carbon loss from converting grassland to arable. Additional environmental issues with intensive cropping: water quality, biodiversity loss etc.
- Increased destruction of rain forest to produce yet more soya and palm oil

Increased crop production

- Intensive crop production = heavy application of fertilisers and pesticides, resulting in soil degradation and biodiversity loss
- LUC to soyabean production = GHG emissions, biodiversity loss, soil degradation and erosion
- As primary plant source of essential amino acid lysine, soya production would increase if we were to shift to monogastric and plant-based sources of protein (Leinonen et al, 2019)
- Shouldn't these be taxed too?

Nitrogen taxation – a better solution

- N fertiliser are a major cause of atmospheric and aquatic pollution. The European Nitrogen Assessment (Brink et al, 2011) and subsequent studies (Van Grinsven et al. 2013), estimated an environmental and health cost to the EU of between **€35 to €230 billion** p.a. in 2011 (= up to **€18.4 bn in UK based on it using 8% of EU-28 nitrogen fertiliser)**
- 3.5 times more reactive nitrogen in the ecosystem than is sustainable
- Taxing synthetic nitrogen would increase the cost of intensive grain-fed meat, but have only minimal impact on the meat from more extensive grass-based production. Better still would be to tax nitrogen loss using nitrogen budgets because this would be fairer to good farmers and less likely to result in increased imports. Net impact to make grain-fed meat more expensive

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