

# Which interventions work? Reducing the environmental impact of diet

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Environmental Association of Universities  
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**UNIVERSITY OF  
CAMBRIDGE**

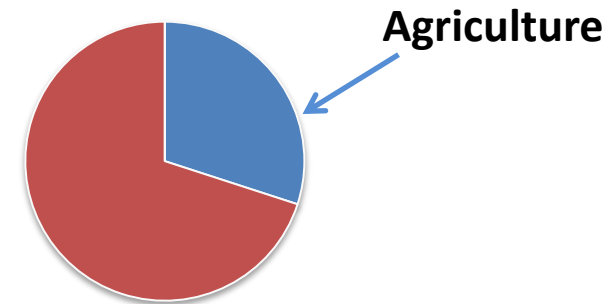
# Outline

- 1) Food and the planet
- 2) What does a sustainable diet look like?
- 3) What interventions in cafeterias might work?

# Food and climate change

- Agriculture responsible for ~30% of climate change
  - ~ Half of this is from livestock

Climate change



Foley et al (2011) *Nature*. Estimate 30-35%

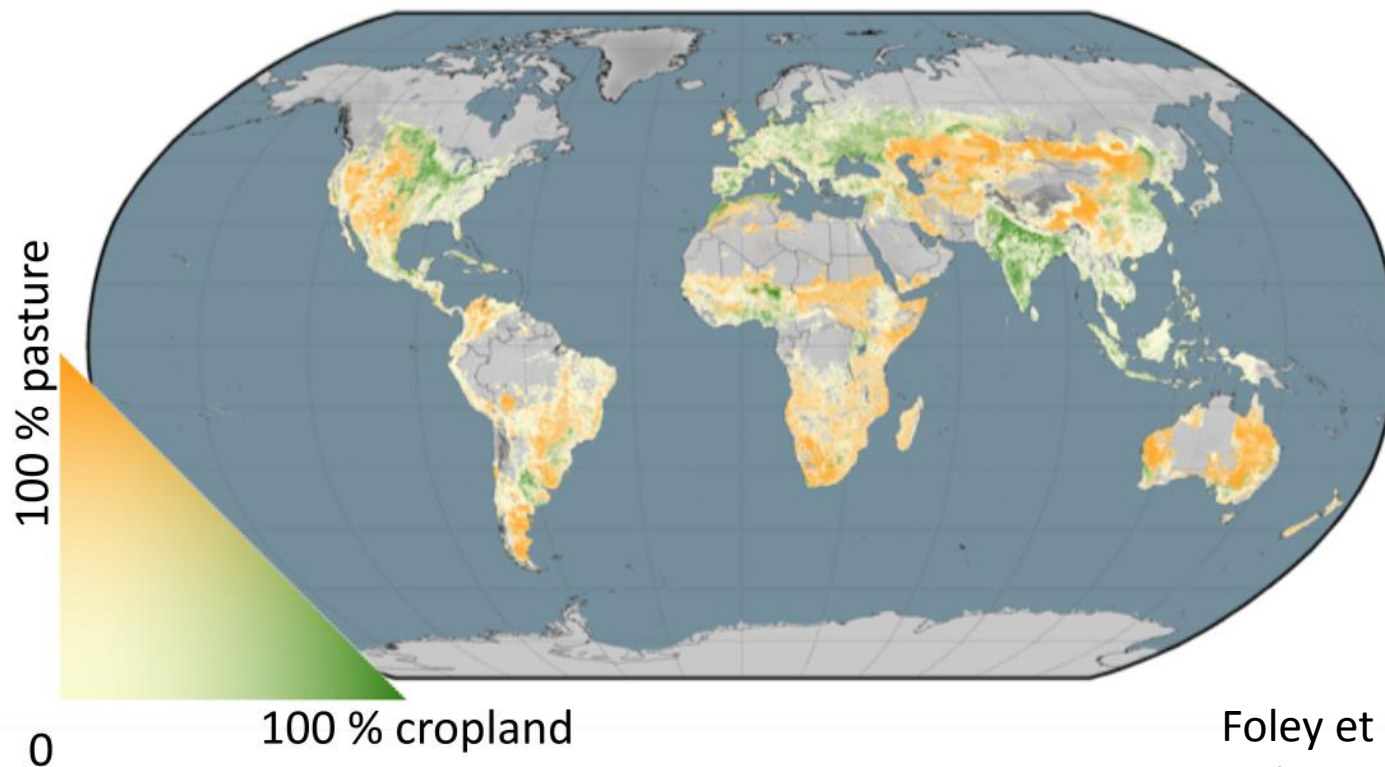
Vermeulen et al (2012) *Annual review of environment and resources* Estimate 19-29%

Infographic: FAO (2014) Greenhouse Gas Emissions from Agriculture, Forestry and other Land Use

Images: Pixabay

# Food and land use

- Agriculture already occupies 38% of Earth's ice free land



Foley et al (2011) *Nature*,  
Supplementary Information

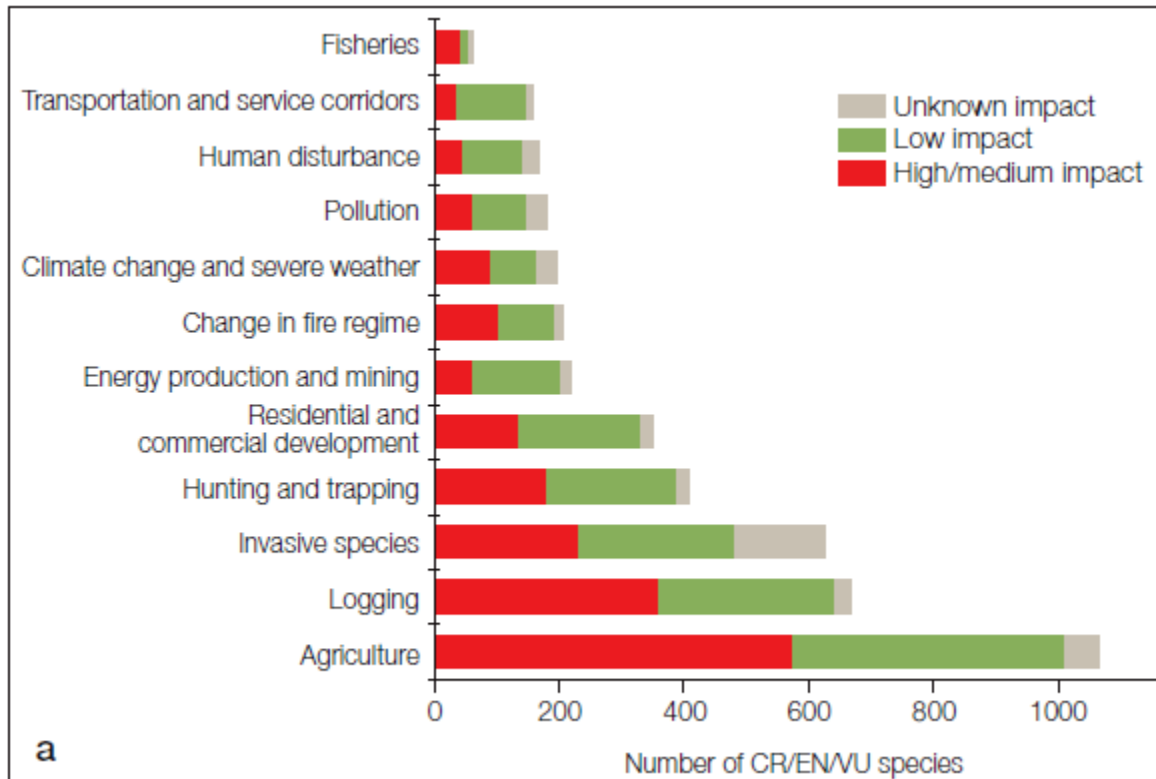
# Food and soil loss



- 1cm of soil takes 200-400 years to form
- Agricultural soil is being eroded: we are running out of soil
- 95% of our food comes from soil

# Biodiversity

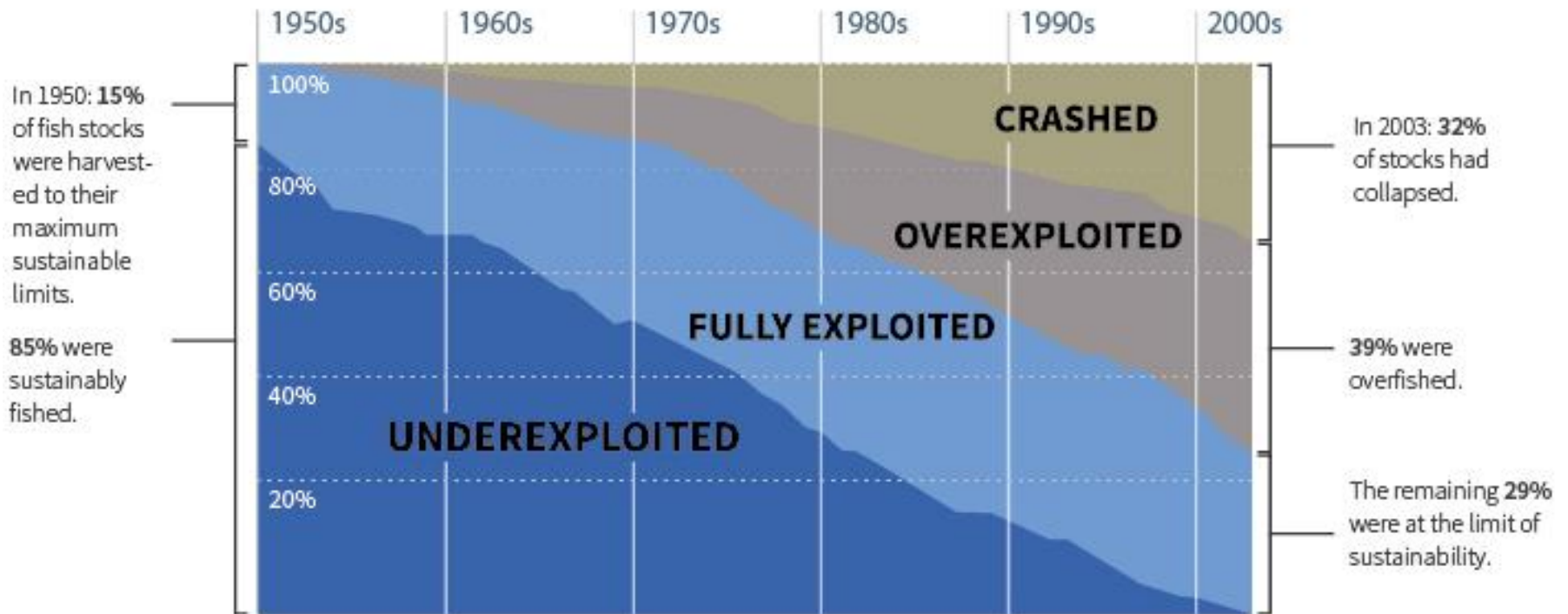
Farming is the biggest threat to threatened species



Vie et al (2009) IUCN

See also Machovina et al (2015) *Science of the Total Environment*

# Oceans and overfishing

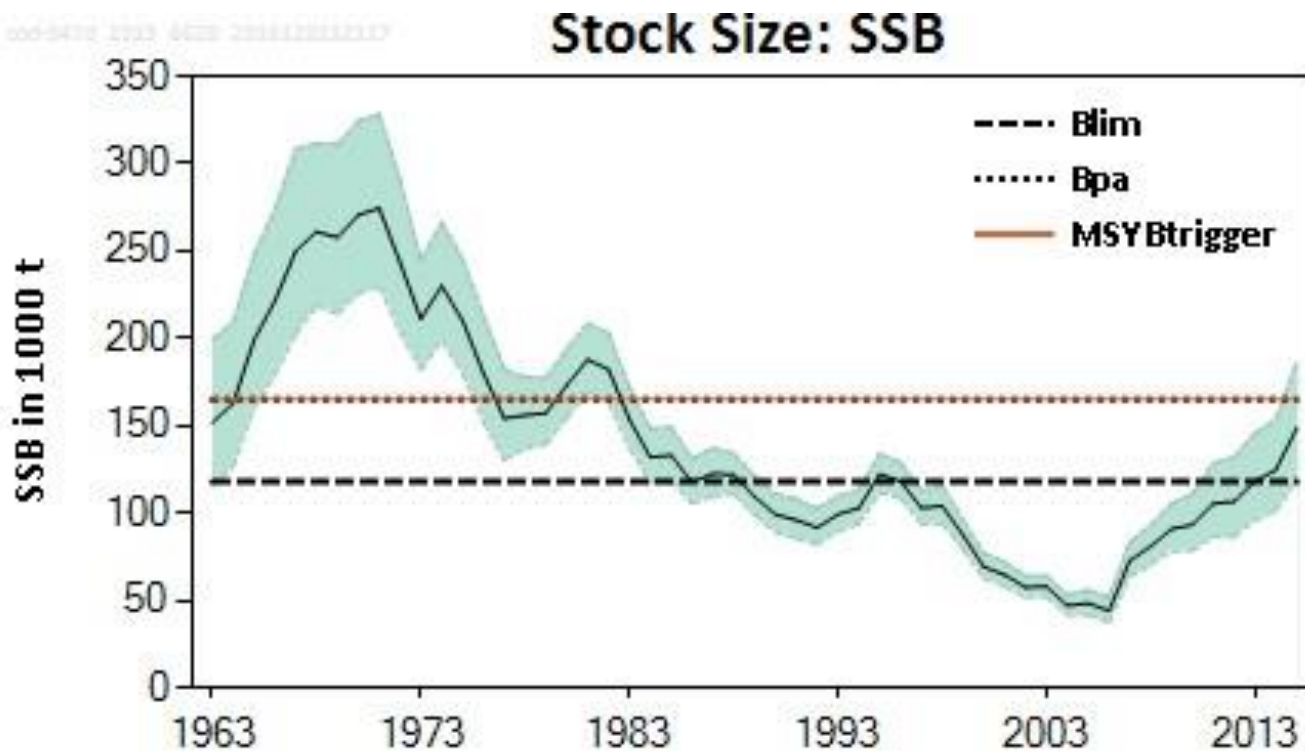


<http://oceaneos.org/state-of-our-oceans/overfishing/>

<http://www.opiinc.org/Ocean-Problems/overfishing>

# Cod stocks

- North sea cod: population over time

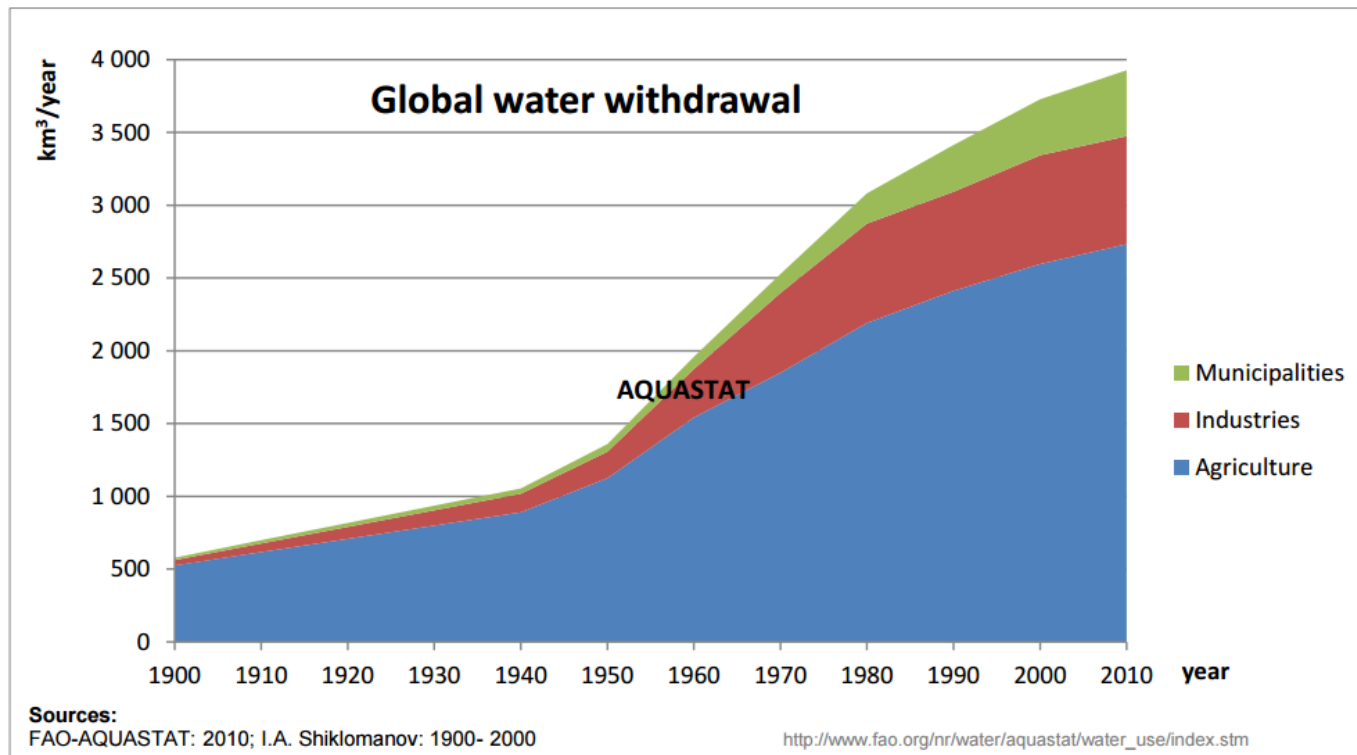


<http://www.worldfishing.net/news101/industry-news/north-sea-cod-enters-msc-assessment>



# Water use

- 69% of water withdrawal is used for agriculture



# Water use

**SAVE 1300 GALLONS OF WATER**

**DONT FLUSH  
YOUR TOILET FOR**



**6 MONTHS**

OR

**DONT TAKE A  
SHOWER FOR**



**3 MONTHS**

OR

**FOR LUNCH TODAY,  
DONT EAT**



**1 BURGER**

[GOTDROUGHT.COM](http://GOTDROUGHT.COM)

# Food and local water quality

- Utilities company extracts water from under Thetford forest to dilute water polluted by animal agriculture.
  - Meet EU regulations.

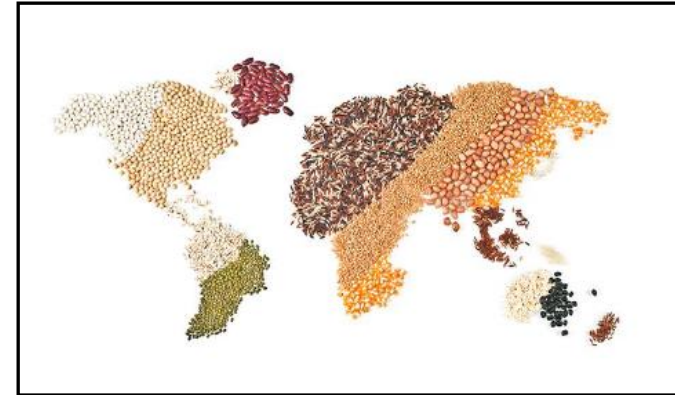
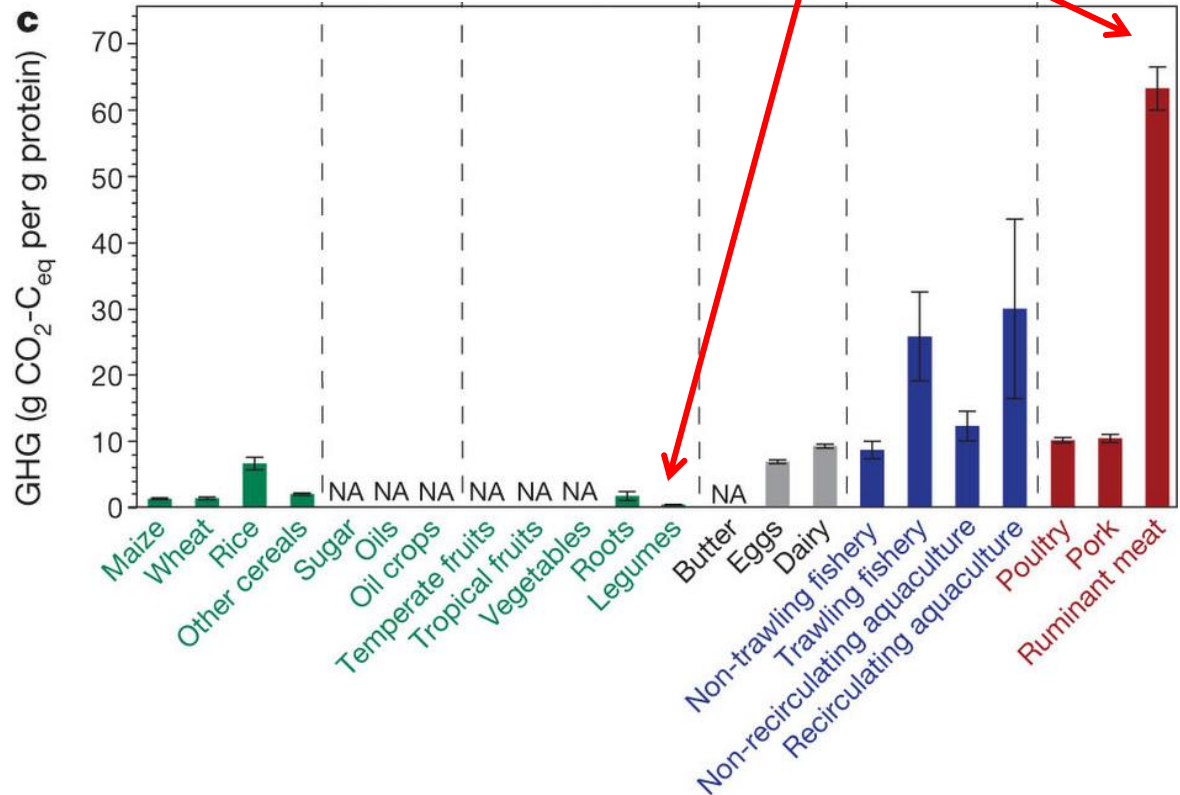


<http://www.monbiot.com/2015/10/05/on-bullshit/>

2) What does a sustainable diet look like?

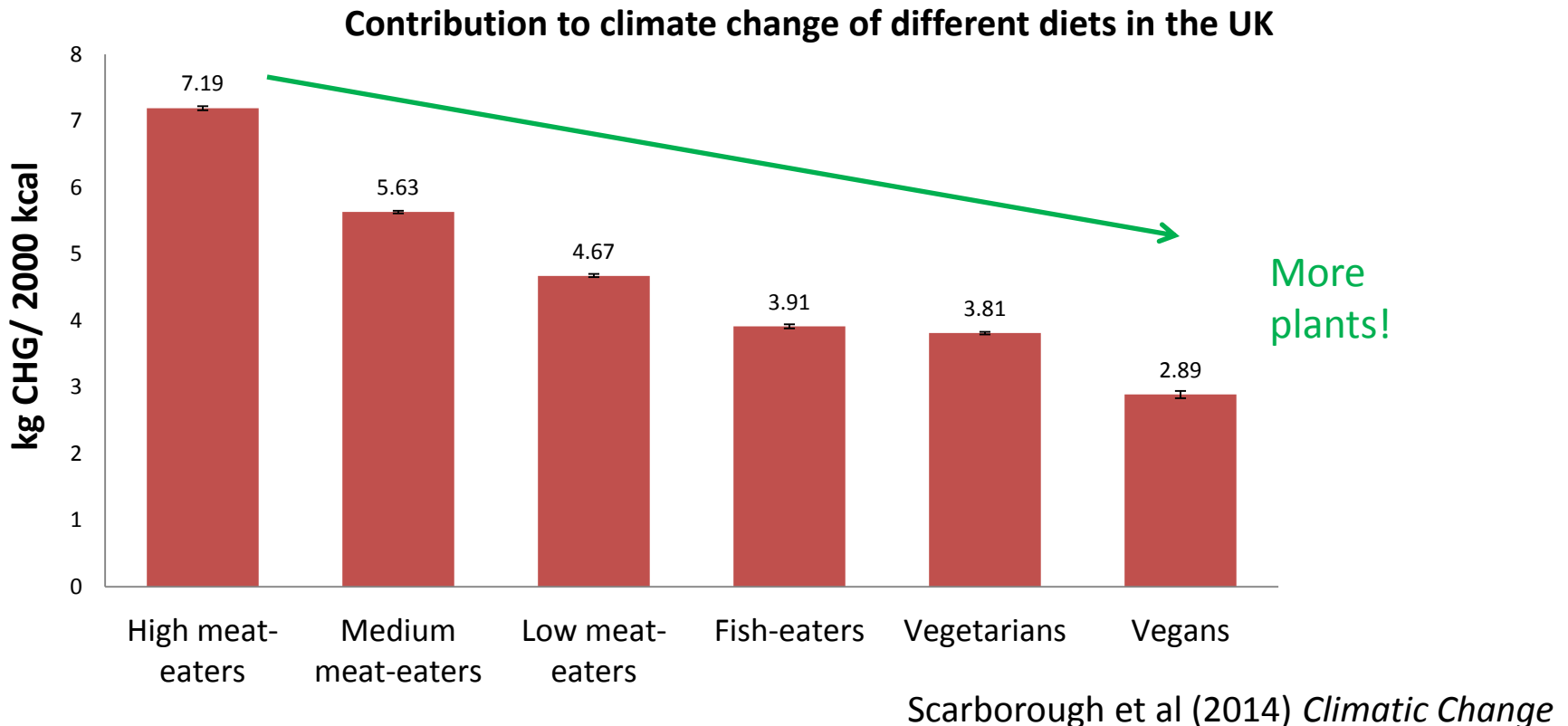
# Sustainable diets – less beef and lamb

- Per gram of protein, beef and lamb have 250x the climate footprint of lentils and chickpeas



# Sustainable diets – more plants

- Switching from high meat eater to vegan reduces diet's GHG footprint by 60%
- High meat eater to low meat eater, still reduces it by 35%



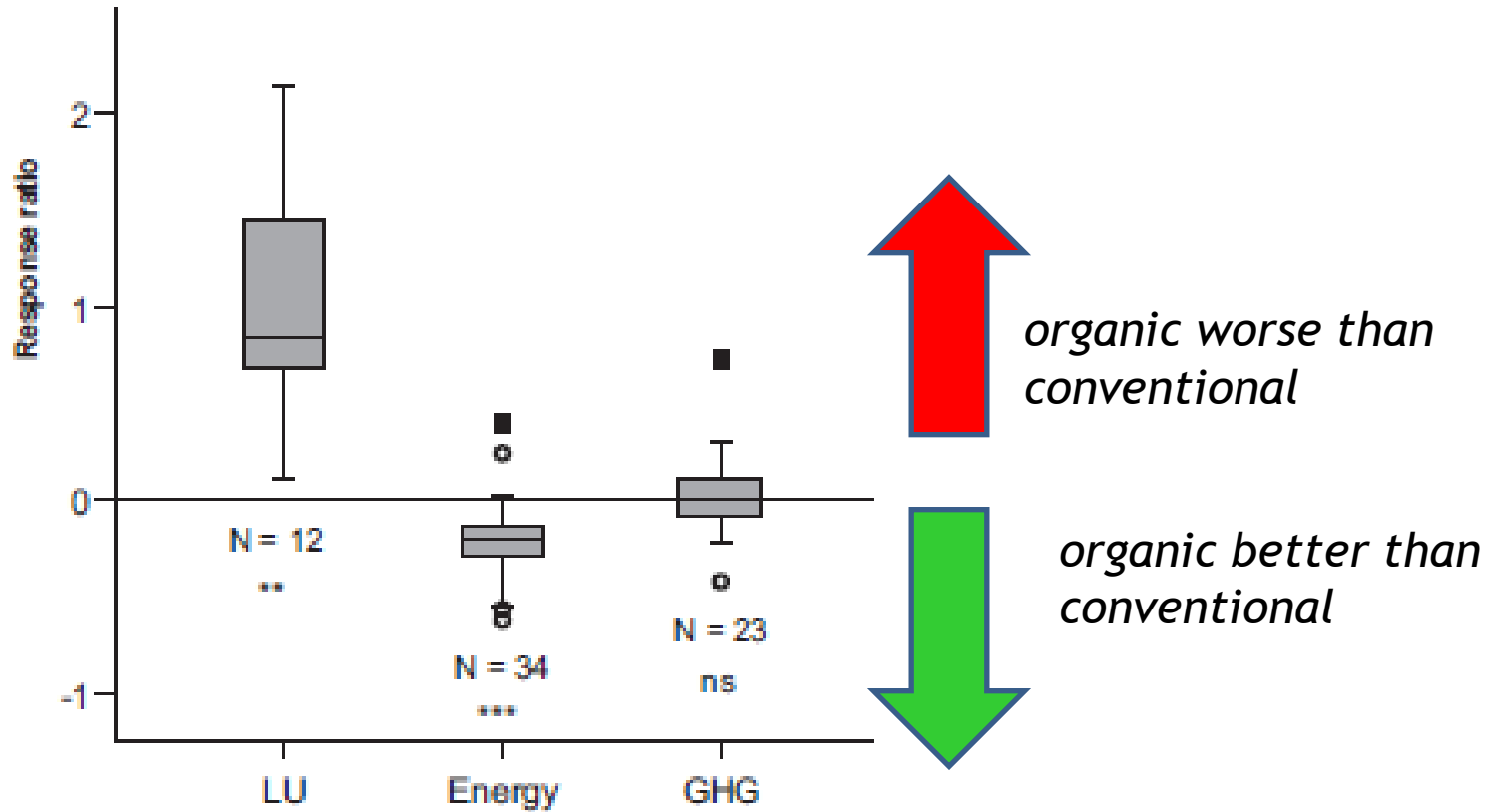
# Less food waste

- One third of food produced globally is wasted.
- In developed countries this amounts to 95 to 115 kg per person per year



Gustavsson et al (2011) *Global food losses and food waste*

# Organic – not always better



Tuomisto et al. 2012



# Food miles: more plants is more important than eating local



- “Transportation as a whole represents only 11% of life-cycle GHG emissions”
- “Final delivery from producer to retail contributes only 4%.”
- “Shifting less than one day per week’s worth of calories from red meat and dairy products to chicken, fish, eggs, or a vegetable-based diet achieves more GHG reduction than buying all locally sourced food.”

# Suggested priorities for a more sustainable diet

- More plant-based food
- Fewer animal products, particularly beef and lamb
- Only sustainably caught or grown fish
- More field-grown, seasonal, local vegetables
- Reducing food waste

### 3) What cafeteria interventions might work (to get us to eat more plants)?

- Delicious defaults
- Availability (of plant based food)
- Providing vegan options
- Smaller meat portions?
- Accessibility – cafeteria layout
- Prices
- Sustainability labelling

# What influences selection of vegetarian options in USA college students?



- Experimental variables:
  - Information vs no information on env. benefits
  - Vegetarian as default options vs not
  - Tasty vegetarian option vs unappealing
- Data on:
  - Participant gender
  - Pro-environmental values
- Which do you think increased the chances of choosing a vegetarian meal?

# What influences selection of vegetarian options? Delicious defaults

- Experimental variables:
  - ~~– Information vs no information on env. benefits~~
  - Vegetarian as default options vs not
  - Tasty vegetarian option vs unappealing
- Data on:
  - Participant gender
  - ~~– Pro-environmental values~~
- Likelihood of picking vegetarian option increases when the participant is female, and the vegetarian meal is tasty and the default

# Availability – what is being served?

## EVENING MENU

### Starters

**Homemade Soup of the Day** (Refer to "Today's Specials") A delicious homemade soup served with a bread roll and butter **£4.95**

**Bread and Olives (V)** **£2.95**

**Camembert (V)** **£6.45** Individual camembert's studded with garlic and rosemary, grilled till oozing, served with breads to dip.

### Light Bites

**Grilled Mackerel Fillets** Served with date & apple chutney, chilli & grapefruit salad and multigrain bread **£6.50**

**Paté** Served with toasted multigrain fingers **£4.95**

**Roll Mop Herring** A generous serving of roll mop herring, served with a salad garnish and multigrain bread **£6.55**

### Favourites

**Our Famous Fish & Chips** A hand-battered cod, served with a generous portion of chips and a slice of white bread. Choice of either garden or mushy peas **£9.95**

**Homemade Succulent Steak & Ale Pie** **£9.95** Diced succulent steak with button mushrooms cooked in ale. Topped with a pastry lid and served with our famous creamy mash and seasonal vegetables

**Pie of the Day** (Refer to "Today's Specials") Made by our chef today. Certain to be tasty and filling **£9.45**

**Salmon & Haddock Fish Pie** A Fish Pie consisting of salmon, haddock, cheesy mash and a hardboiled egg, served with seasonal vegetables **£9.95**

**Liver and Bacon** A British classic! Tender lamb's liver in a rich gravy with crispy bacon. Served with our famous creamy mash and seasonal vegetables **£9.95**

**Sausage and Mash** Locally Sourced Award-Winning Cambridgeshire 'Dingy Dill' sausages\* served on a bed of mash, topped with crispy onions and homemade gravy **£9.65**

**Chicken Caesar Salad** Tender chicken strips on a bed of cos lettuce mixed with croutons, sprinkling of parmesan cheese and garnished with a drizzle of Caesar dressing. *Add Bacon for £1.00* **£9.65**

**Slow Cooked Lamb Shank** Whole lamb shank braised with Worcester sauce until tender. Served with our famous creamy mash and seasonal vegetables **£11.95**

**Free Range Chicken Breast** Served with pan fried button mushrooms, chips and a salad garnish, and finished with a Diane sauce **£11.95**

**Shepherd's Pie** Tender lamb shank pulled and combined with vegetables and gravy. Topped with our famous creamy mash and served with seasonal vegetables **£9.95**

**Shortcut Beef Rib** This large beef rib is braised in ale until succulently tender. Served with our famous creamy mash and seasonal vegetables **£11.95**

### Sides

**Chips** **£2.45**

**Fries** **£2.35**

**Onion Rings** **£2.45**

**Side Salad** **£2.95**

**Garlic Bread** **£2.95**

**Garlic Bread with Cheese** **£3.45**

**Homemade Coleslaw** **£2.65**

**Bread & Butter, white or multigrain** **£1.00**

### Steaks and Ribs

**Whole Rack of Ribs** A whole rack of ribs covered with our BBQ sauce, served with a generous helping of homemade coleslaw, grilled corn-on-the-cob and a large portion of fries **£15.95**

**Prime beef steaks** Grilled to your liking. All served with a grilled tomato, onion rings, a grilled flat mushroom and a generous portion of chips.

**10 Oz Sirloin** **£16.95**

**10 Oz Ribeye** **£19.95**

### STEAK AND WINE TIME £49.95

Available from 5pm daily

**2 local prime beef sirloin steaks, grilled to your liking. All served with a grilled tomato, onion rings, a grilled flat mushroom and a generous portion of chips. Feeling Saucy?** Peppercorn, Diane or Béarnaise **£2.25**

Choose from the following wines:

- Catani Bianco di Sicilia (White - Sicily, Italy)

- Il Piazzì Nero D' Avola (Red - Sicily, Italy)

- La Croix Sant Pierre Rose (Rose - French)

### Burgers

All our burgers are served on brioche buns and served with homemade coleslaw, burger relish and a generous portion of fries as standard

**Cheese and Bacon Burger** Topped with crispy lettuce, tomato, gherkin, melted cheese and crispy bacon **£10.95**

**Chicken Burger** Two halves of battered chicken breast, topped with crispy lettuce, tomato, citrus mayonnaise, crispy bacon and melted cheese accompanied by two onion rings **£9.95**

**The Eagle Burger** Two of our prime beef burgers on top of crispy lettuce, gherkin, tomato, melted cheese and crispy bacon, topped with two onion rings **£14.95**

**Mamma Mia Vegetarian Burger (V)** **£9.95** A sweet potato, soya bean, red pepper and mozzarella cheese patty in a basil crumb, topped with crispy lettuce

### Desserts

**Sticky Toffee and Date Pudding** served with a clotted cream and Drambuie sauce **£4.95**

**Traditional Apple Pie** served with custard **£4.95**

**3 Scoops of Ice Cream** **£4.45**

**Cheese Plate with Port** A selection of 3 locally sourced cheeses served with biscuits, grapes and celery **£6.95**

**Today's Dessert Specials** are locally sourced from The Dessert Company and individually handcrafted using traditional methods. Please choose from the specials menu **£4.95**

\*Our award-winning sausages come from Cambridge Quality Meats, a local, independent, family-run company with more than 40 years' experience.

Please be aware that all of our food is prepared in kitchens where nuts and gluten are present as well as other allergens therefore, we cannot guarantee that any of our food is completely free from traces of allergens. Full allergen information is available upon request from a member of our team.

- Is the menu mostly meat or mostly plants?

1 vegetarian,  
10 beef and  
lamb options



7 vegetarian  
& vegan, 3 beef  
and lamb  
options

NIBBLES	
Cumberland sausage roll by the inch 1.50	Archoke, white bean & taragon aioli, toasted pita (w) 3.5
	Greek green mammoth & Kalamata olives (v) 3.5
<b>EVENING</b> Daily from 5pm 'til 10pm	
Swede & kale hash brown, oyster mushrooms, white bean & taragon aioli (w, gf)	6
Seared cod cheeks, cauliflower puree, candied pecans (gf)	7
Braised lamb spring roll, baked aubergine puree & tahini yogurt	7
Lemon & oregano grilled mackerel, celeraic & red pepper tabbouleh, crumbled feta (gf)	6.5/12
Sprouting broccoli, mange tout & fregola salad, roasted red pepper & rapeseed pesto (w)	6/11
Butternut squash gnoccoli, crispy sundried tomato & sage parcel, red chard & parsley dressing (w, gf)	6/11
The Tandem: miso sweet potato, tomato, avocado & corn bruschetta, baked aubergine, sticky cauliflower wings, white bean hummus & toasted pita for two to share (w)	14.5
~~~~~	
Heritage carrot, pepper & coconut curry, chilli & seaweed croquette, toasted cashews (w)	11
Pan fried sea trout, garlic polenta, chorizo, cabbage & raisins, watercress pesto (gf)	16
Seared and roasted brill loin, spring leek & pearl barley risotto, Carrot gel, pea shoots	15
Sirloin steak, chips & béarnaise (gf)	20
Posh kebab, coriander & ginger slaw	
~ Maintained slow roasted shoulder of lamb, saffron aioli	13.5
~ Covenne, paprika & garlic marinated chicken thighs, saffron aioli	13.5
~ Chilli & lime falafel with chilli jam (w)	12
Roasted squash, beetroot, lamb's lettuce & quinoa salad, seeds & pomegranate dressing (w, gf)	0.50
add... ~ roasted miso, chilli, min & sesame seed aubergine (w)	2.5
~ lemon & thyme marinated chicken breast (gf)	
Ham hock, bacon & Njuda meatballs, pistou & spring vegetable cassoulet	15
~~~~~	
Nori seaweed seasoned vegetables (w, gf)	3
Triple cooked chips & saffron aioli (v, gf)	3
Cajun seasoned roast potatoes (v, gf)	3
Chorizo, butter beans & rosemary (gf)	4.5
(v) Vegetarian (w) Vegan (gf) Gluten Free	
For tables of 8 or more or private dining A discretionary 10% service charge will be added to your bill. Allergen information is available. Please ask a member of our team for details.	

# It is now illegal not to offer vegan food at prisons, hospitals and schools in Portugal



Ashitha Nagesh for Metro.co.uk Friday 10 Mar 2017 5:37 pm



39.8k



Public canteens have six months to start offering vegan options (Picture: Getty Images)



Petitions

UK Government and Parliament

Closed petition

**Put a VEGAN meal on every school, college, university, hospital and prison menu.**

Over 5% of the population is vegan and growing. A vegan diet is healthier, it conserves resources and protects the planet, above all it's cruelty free. United Nations has called upon us to consume more plant based foods. Animal products are linked to the increase in cancer and heart disease.

[▶ More details](#)

This petition is closed

All petitions run for 6 months

**19,012** signatures

100,000



Government responded

“ Individual institutions are responsible for the nutrition of their members and being aware of health, religious, cultural and ethical choices: and doing all they can to facilitate that choice.

[▶ Read the response in full](#)

# Providing vegan options

- Meat free Monday: “restricting choice”
- Choice from the other direction: providing plant based meals
- Portugal: all public cafeterias must have a vegan option (extending choice and improving sustainability).
  - Petition garnered 15,000 signatures.
- UK Government vegan petition “we see value in encouraging people to think carefully about the environmental impact of the food they eat.”

# Smaller meat portions

- Eg adding more vegetables/plant protein and less meat to a stew
- A review on calories found that if smaller portions were sustained across the whole diet, energy consumption could drop by 12% to 16% in UK adults: might this work for meat?





# How accessible are plant-based options?



- Review on “nudging” **healthier** food choices: “food product **order or proximity** can influence food choice” but not much research on whether this works long term.
- I am currently carrying out experiments on food order in different colleges: does placing the vegetarian option first increase its sales?

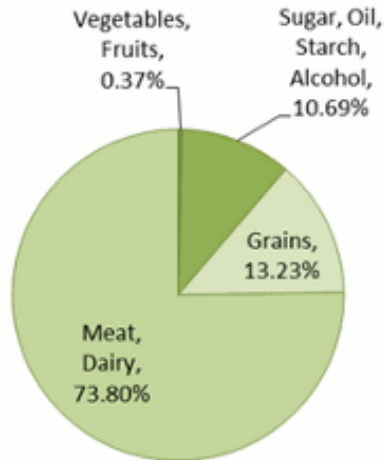


# How affordable are more plant-based options?

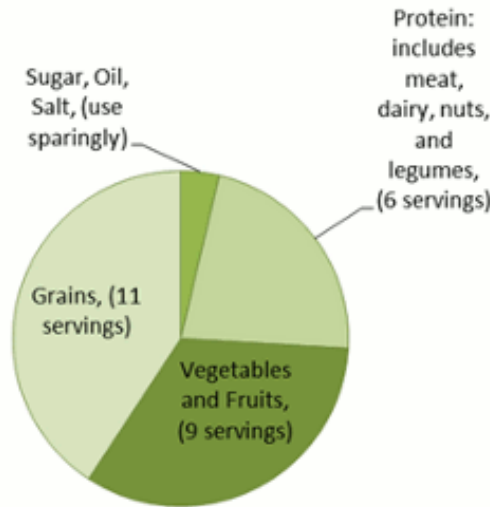
www.globalissues.org

## Why Does a Salad Cost More Than a Big Mac?

Federal Subsidies for Food Production  
1995-2005



Federal Nutrition Recommendations



Source: Physicians Committee for Responsible Medicine, Autumn 2007, Volume XV1, Number 4

News > World > Europe

## Denmark ethics council calls for tax on red meat to fight 'ethical problem' of climate change

With cattle contributing a tenth of global emissions, people are 'ethically obliged' to change their eating habits, an influential government think tank says

Adam Withnall | @adamwithnall | 10 months ago | 435 comments



Click to follow The Independent Online



Steak and other red meats would be taxed highest - but all food could ultimately be targeted Getty Images

<http://www.globalissues.org/article/240/beef>

# Sustainable labelling?

- “The results imply sustainability labels currently do not play a major role in consumers’ food choices... future use will depend on the extent to which consumers’ general concern about sustainability can be turned into actual behaviour”

## *Ethical Labels*



Fair Trade

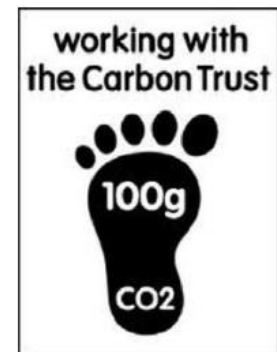


Animal Welfare



Rainforest Alliance

## *Environmental Labels*



Carbon Footprint

# Conclusions

- Sustainable food: more plants, sustainable fish, less food waste?
- Although not much research has been done on interventions to shift to a more plant based diet, we could try making it
  - Delicious
  - Available
  - Accessible
  - Affordable