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Why do we need sustainable diets?

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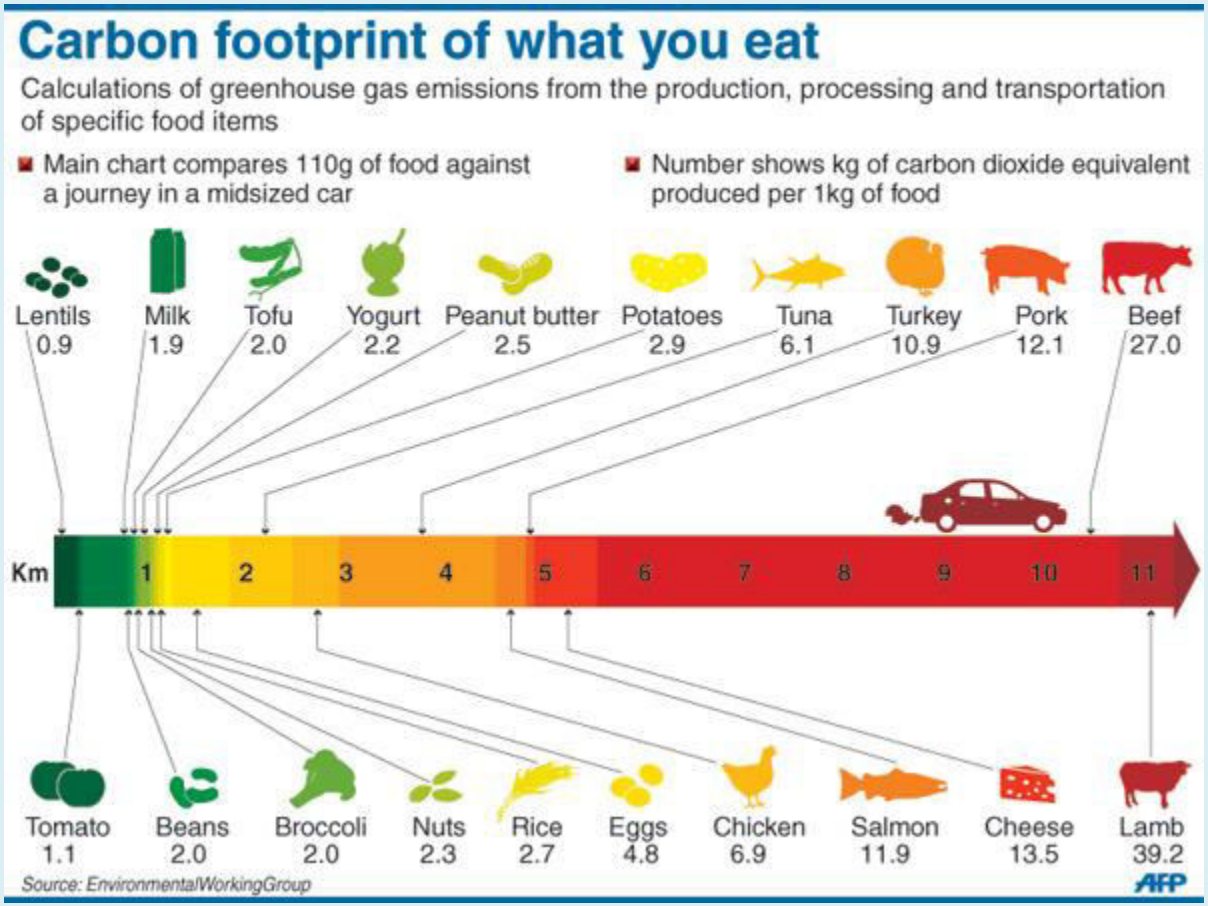
Food choices and health?

- Despite the extent of world food production 805 million people estimated to be malnourished (FAO 2014)
- 2.1billion adults and children are considered overweight or obese (Ng et al 2014)
- However many parents are not able to recognise when their child is overweight (Burton-Shepherd 2015)
- Obesity -> increased risk of hypertension-> cardiovascular disease (non communicable diseases)
- Cardiovascular diseases account for most NCD deaths, or 17.5 million people annually (World Health Organisation 2015)
- NCD deaths are projected to rise to 52 million by 2030 (WHO 2014)

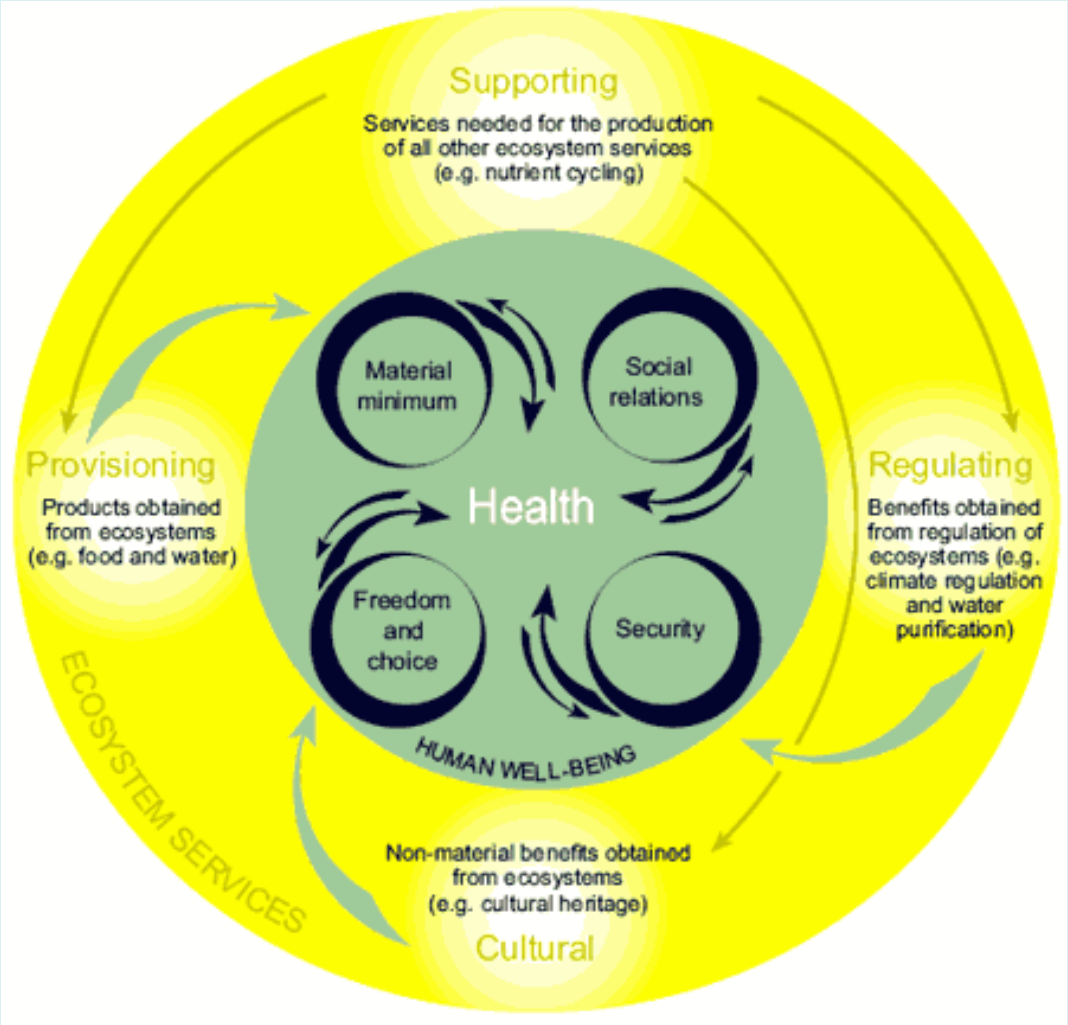
Food choices affect the environment

- Agriculture responsible for more than 30% of global greenhouse gas (GHG)
- Livestock sector alone accounts for 18% GHG emission and 80% of total land use
- Livestock also suggested to cause deforestation, loss of biodiversity and land degradation (Ruini et al 2015)

Even food has a “carbon footprint”



Ecosystems and human health



Defining a “Sustainable Diet”

- What is meant by sustainability?

“Is a sustainable and healthy diet possible?”

No standard definition (FAO 2010) one of choice.

“Sustainable diet (SD) is one that has a low environmental impact which contributes to food and nutrition security and to healthy life for present and future generations.

- SD are protective, respectful of biodiversity and ecosystems
- SD are Culturally acceptable, accessible, economically fair and affordable
- Nutritionally adequate, safe and healthy while optimizing human resources”

Garnett (2014) argues but what does this diet look like on a plate??

What is nutritional adequacy? Population? Individual?

What is a sustainable diet?..(Garnett 2014)



What is good nutrition?

- What does adequate nutrition mean?
- Nutritional adequacy set at population average or those who are nutritionally “vulnerable”?
- Just how reliable are RNI?
- Does the method of food production influences food nutritional status and other health properties, e.g. organic foods??

Are organic food sustainable?

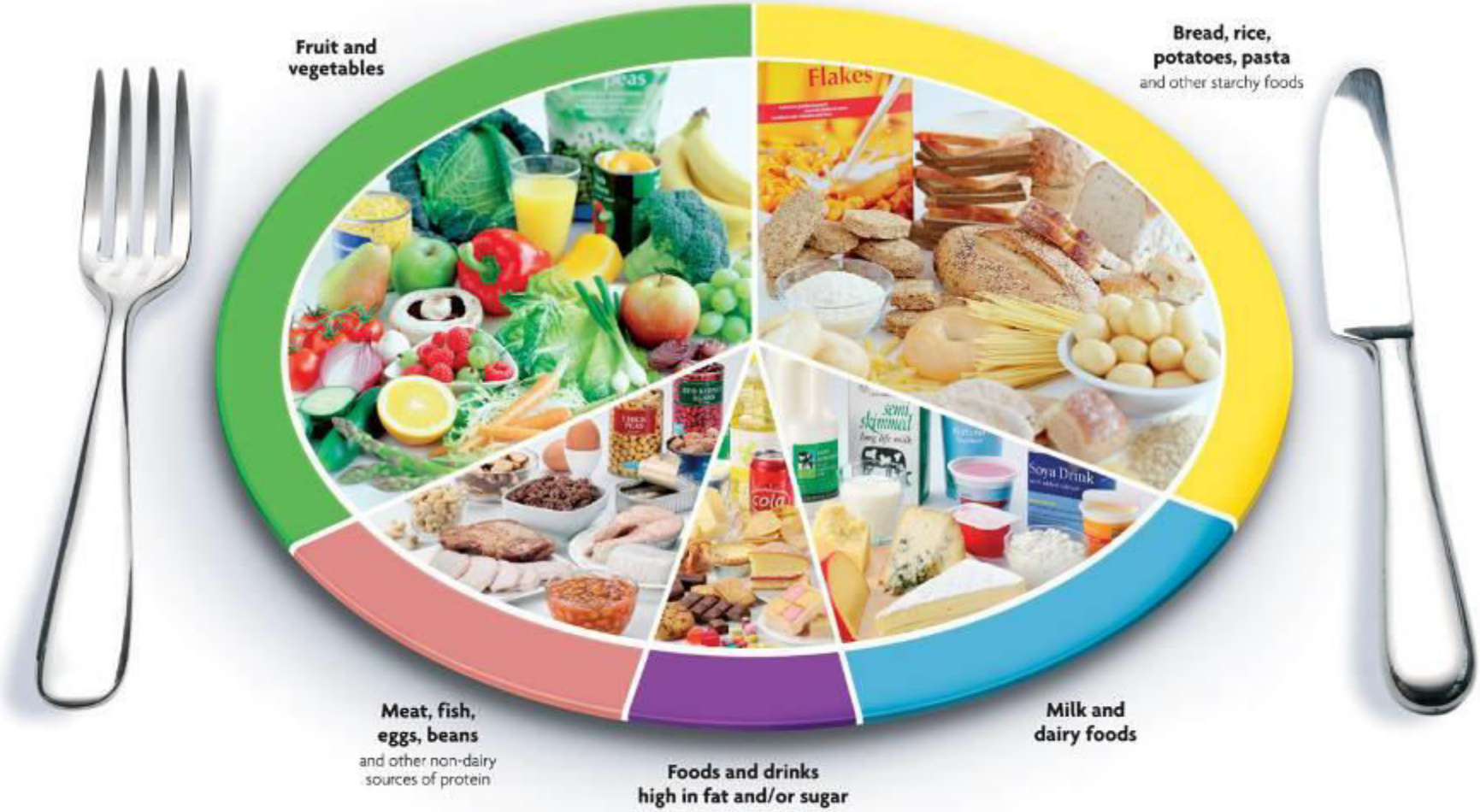
- No evidence that organic foods confer better nutrition (Smith-Spangler et al, (2012) Dangour et al (2010)
- Organic food less likely to have pesticides impact in third world countries.
- Grass fed animals leaner more omega 3 than grain fed counterparts (Dangour 2010)
- However more fat in poultry decreasing omega 3:6 ratio.. (Wang 2010)

Aspects of diet and food supply under the spotlight from a sustainability perspective include:

- fish
- meat
- milk and milk products
- imported food for which deforestation is taking place – cocoa, coffee, palm oil, soya, beef
- excessive food packaging
- food waste

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



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Why we need to talk about meat

- **UK consumption of meat is high** approximately twice the global average.
- **Health:** High levels meat (particularly red & processed meat) linked to bowel cancer, heart disease, diabetes.
- UK Government advice is to eat no more than 70g red & processed meat a day. **6 out of 10 men and 1 in 4 women exceed this.**
- **GHG hotspot:** livestock 14.5% of global GHG emissions
- **Nature:** livestock production responsible for 30% of global biodiversity loss
- **Water, grain and land intensive:** 1/3rd of global grain harvest/97% soya used for animal feed.
- **Food security:** If we halved our meat consumption in rich world we could feed 2bn more people
- **Animal welfare:** Cheap meat = factory farms
- **Quality/traceability/safety:** horsemeat/campylobacter

"Raising meat takes a great deal of land and water and has a substantial environmental impact. Put simply, there's no way to produce enough meat for 9 billion people."

Bill Gates, the Future of Food (2013)

Meat Consumption

- Failure to address excess meat consumption will risk breaking boundaries related to; atmospheric GHG concentrations, disruption of nitrogen and phosphorus cycles, loss of biodiversity..triggering catastrophic environmental changes (Pelletier and Tyedmers 2010)
- However even improving environmental efficiency of meat production is unlikely to have any impact on GHG emissions..(Gerber 2013)
- Simple message.. Eat LESS meat! OR do we let climate change take it's course and adapt to it's consequences??

If we accept that we need to eat less meat need to ask;

A: Nutritional role of meat in the diet

B: What is an environmentally sustainable amount of meat in the diet with some meats preferred to others?

C: Implications of meat and health.

Nutritional role of meat

- We are what we eat..who you are and what do you eat in absence of meat??
- People in low income countries = low income =poor diet diversity may need to consume more animal products
- Westernized countries UK and USA income higher =more diverse range of foods consumed
- High in protein Iron, vitamins A, B and Zinc.
- High in saturated fat..

Low nutrient intakes and/or status in the UK population

Table 1: Nutrients where there is evidence of low intakes and/or status in the UK population

Low intake*	Low status
Iron	Iron
Riboflavin	Riboflavin
Vitamin A	Vitamin B_6
Calcium	Vitamin B_{12}
Magnesium	Folate
Potassium	Thiamin
Zinc	Vitamin C
Iodine	Vitamin D

*'Low' defined as intakes less than the Lower Reference Nutrient Intake (LRNI)

Source: SACN (2008): The Nutritional Wellbeing of the British Population

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CHALLENGES

Not meeting dietary recommendations for many foods and nutrients

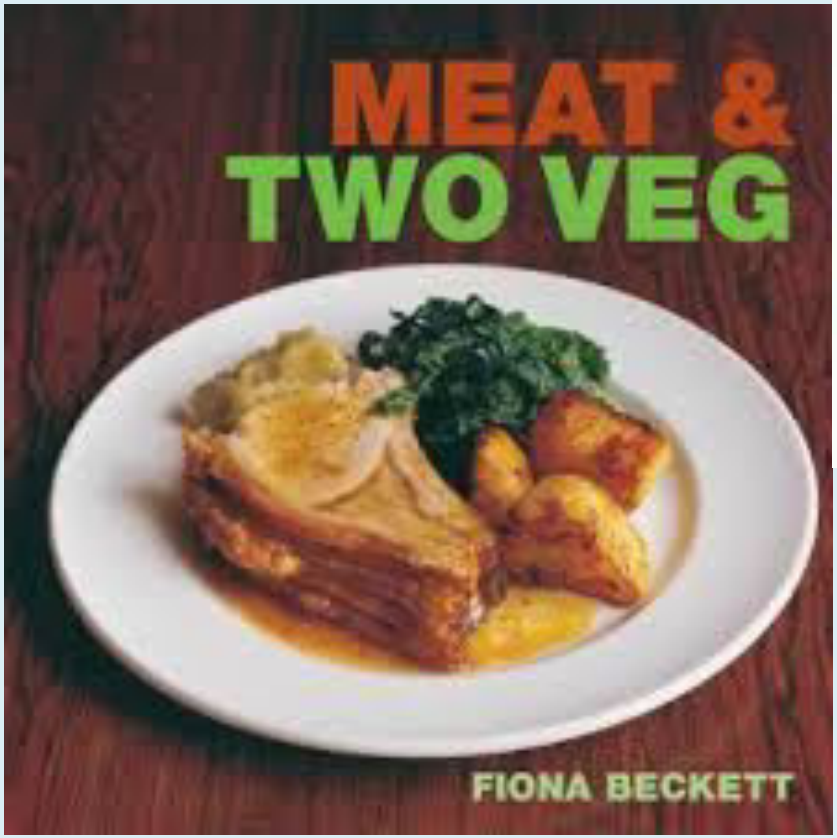
Food / nutrient	Recommendation	Current intake	Meeting recommendation?
Fruit & vegetables	At least 5x80g/d	4.4x80g/d	✗
Oily fish	At least 1x140g/wk	~70-80g/wk	✗
Energy	M ~2500kcal/d F ~2000kcal/d	M 2255kcal/d F 1645kcal/d	✓
Fat	Average 35% en	Average 33% en	✓
Saturated fat	Average 11% en	Average 12.8% en	✗
NMES (added sugars)	< 11% en	Average 12.5% en	✗
Dietary fibre	Average 18g/d	Average ~13g/d	✗
Salt	Average 6g/d	Average 8.6g/d	✗
Vitamins & minerals	Dietary reference values	Various	✓ ✗

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Meat consumption and health

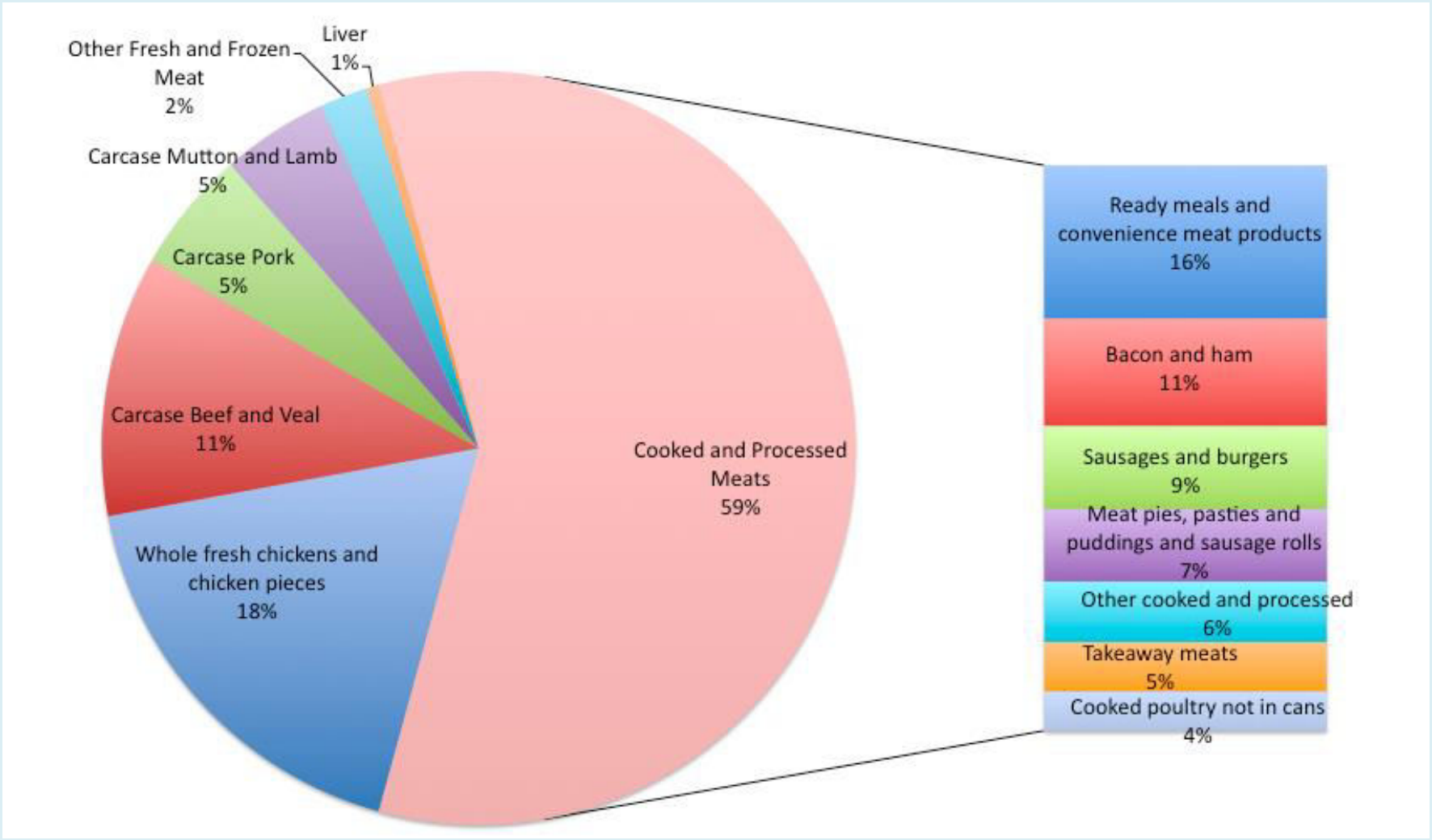
- UK and US high meat consumption linked to obesity and chronic disease heavily disputed (Garnett 2014)
- Surely being a vegetarian is better? Lower BMI and lower all cause mortality??
- However meat as part of a “balanced diet” and health conscious meat eaters when compared to vegetarians see no difference in overall mortality, CHD or cancer (Keys 2009).
- Meat alone does NOT cause obesity..(Wyness 2011)
- 60% of all new infectious disease are zoonotic in origin and 75% of new human pathogens reported in last 25 years originated in animals (Tomley & Shirley 2009)

Meat and two veg??

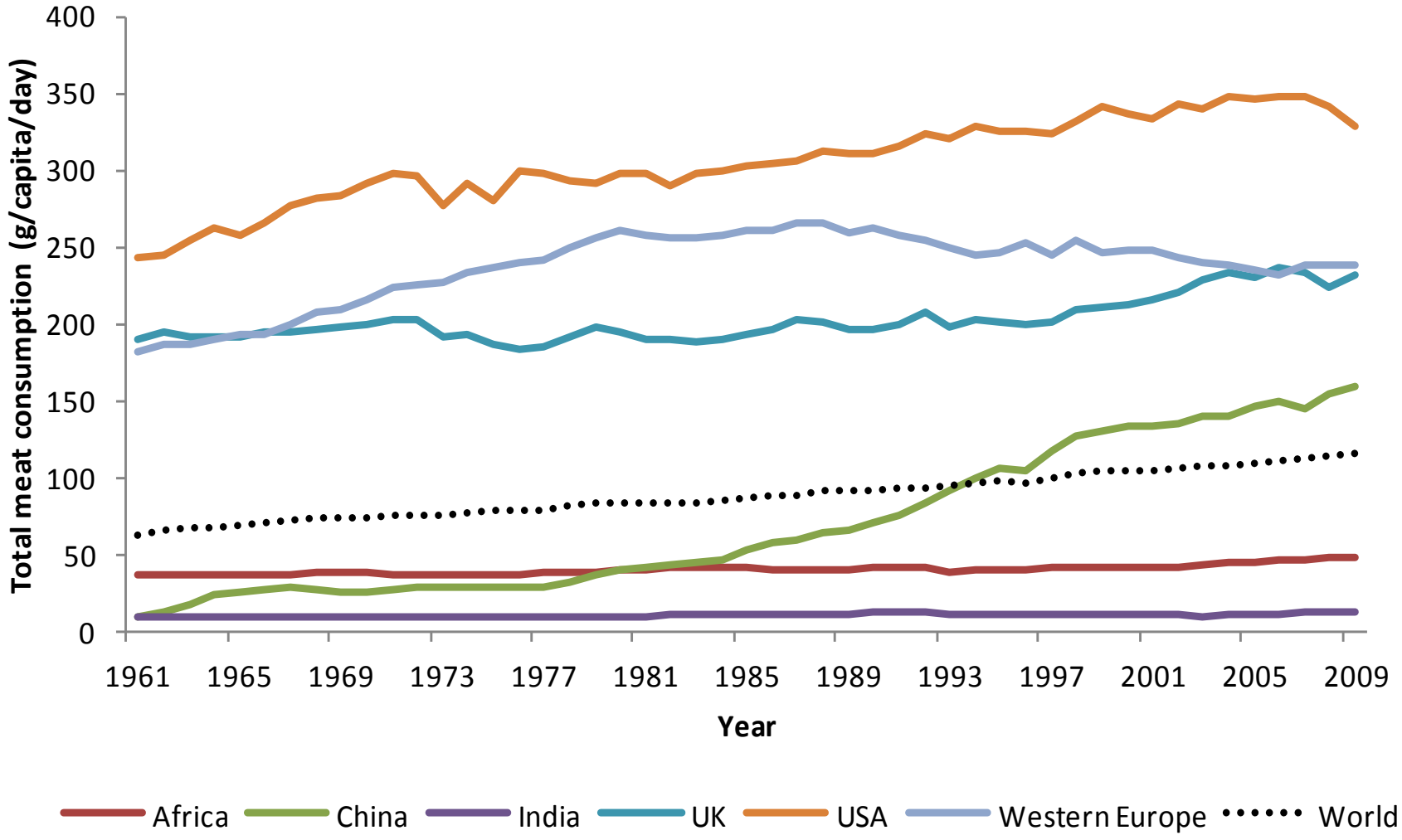




Sources of meat consumption (UK)



Meat consumption around the world



Global meat consumption has almost doubled in the last 50 years from 63g (person/day) in 1961 to 115g (person/day) in 2009 (FAOSTAT 2013).

Saturated fat debate

- Well documented animal products are main source of saturated fat which can cause chronic disease..
- So replace with refined CHO??
- SACN (2015) eat more fruit and vegetables and reduce sugar intake..
- Issues with crops, agricultural methods, fertilizer, pesticides, irrigation??(Garnett 2014)
- Livestock breeding reduces fat content by 30% in pork, 15% for beef and 10% lamb (Wyness et al 2011)
- Stearic fat found in beef fat does not contribute to CHD..
- Long term randomized controlled interventions are almost lacking and the body of evidence is based on epidemiological data which allows conclusions only regarding associations, instead of effects. However, a recent systematic review, which included prospective cohort studies with high or moderate quality, showed convincing evidence on the favourable effect of partially replacing saturated fatty acids by polyunsaturated fatty acids on the risk of CHD (Schwab 2015)

White meat and health?

- Both protective (Pan et al 2012)
- However.. Poultry fed on soy = soy deforestation = undermining food security..(FOE 2008)
- Battery farm chicken one third more fat, increased antibiotic use and food safety..vs free range?
- Is all processed meat consumption risky or does quantity matter??
- WRCF and SACN (2011) indicate that 70g per portion per day processed meats unlikely to confer harm.
- ONE SIZE DOES NOT FIT ALL!!!

Attitudes to meat

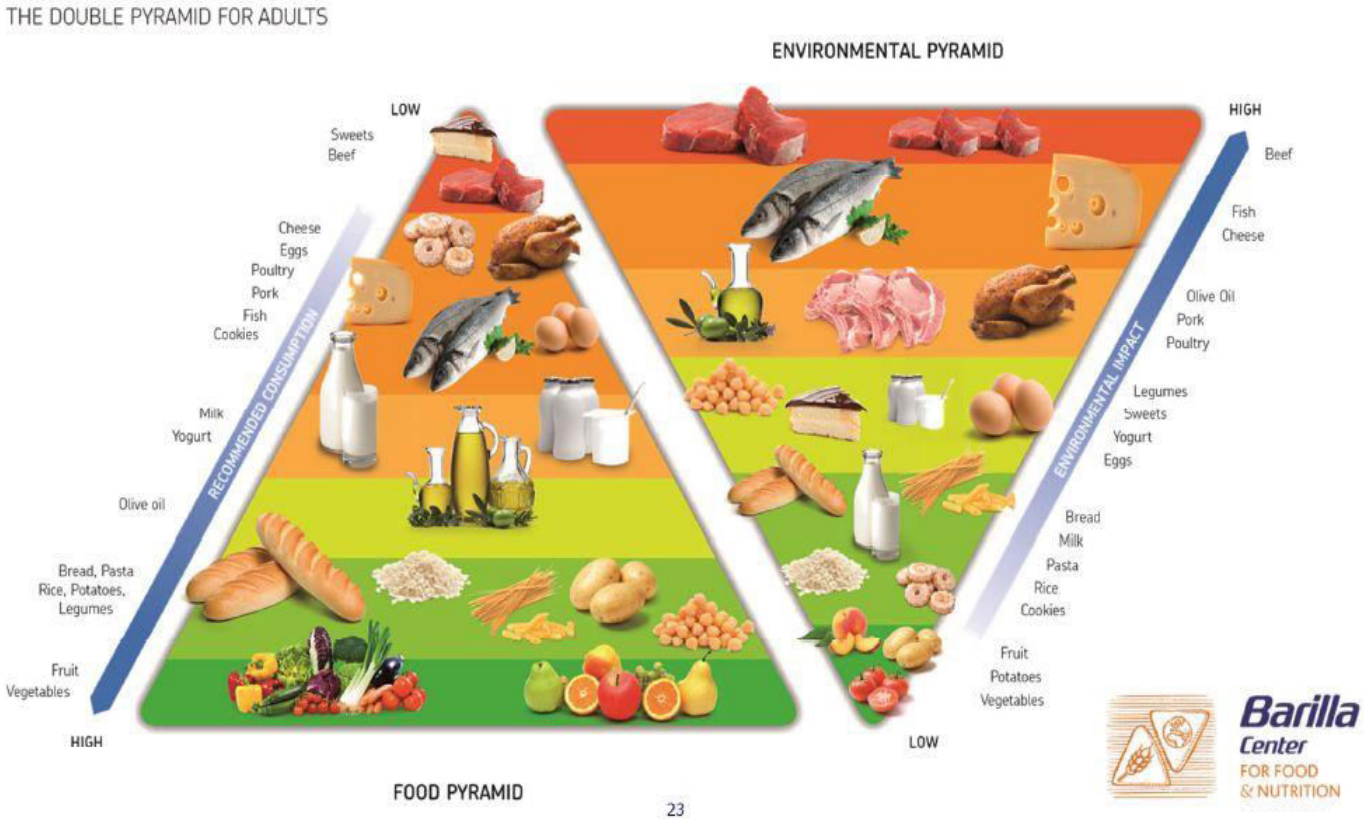
- Defra (2011) majority of people say open to changing their diet to help the environment. 63% willing to cut down on red meat; 45% dairy; 76% confectionery.
- Eating Better (2013) third willing to consider eating less meat, around 50% willing to pay more for ‘better’ meat (eg taste, healthier, higher animal welfare, better returns for farmers) – not just higher social grade groups
- Young people more likely to say don’t eat any meat (1 in 6)
- FSA (2012) safety of meat from outside UK of most concern
- WRAP: 13% of meat is wasted (household)
- We like it (50% said it was favourite part of their meal)
- Cultural significance (meat & 2 veg)

What don’t we know

- Detailed, timely & comparable consumption figures
- Consumption data doesn’t distinguish how meat is produced
- What dishes people eat? How cooked/served?
- No quantitative dietary model that describes how to achieve a diet that is both healthy & sustainable (how much meat/of what type/for different consumers)
- Relevant to individual behaviour – how much do I eat?
- Future trends?

THE BCFN FLAGSHIP CONCEPT

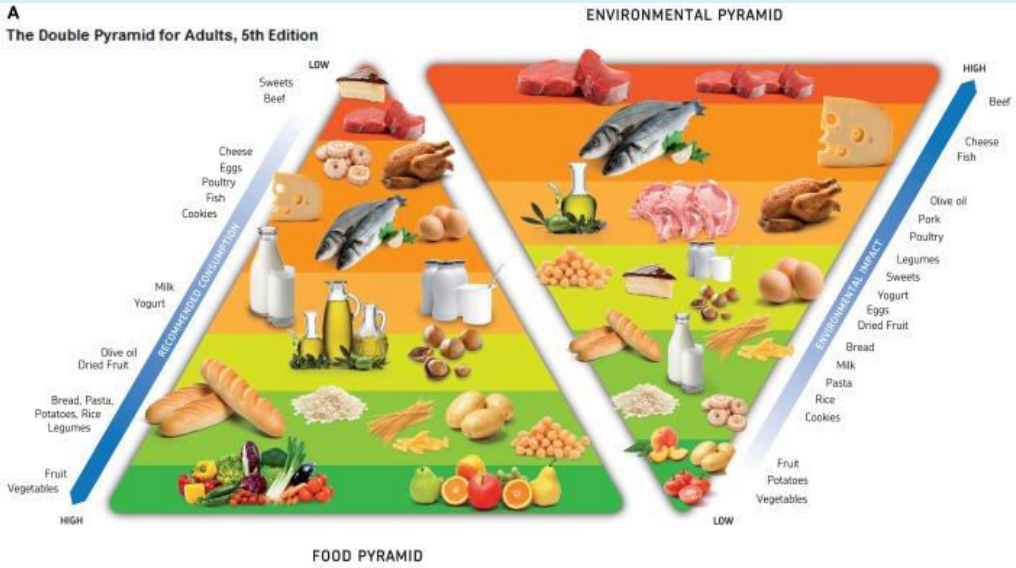
GOOD FOR YOU, SUSTAINABLE FOR THE PLANET
THE NUTRITIONAL AND ENVIRONMENTAL DOUBLE PYRAMID MODEL



Barilla
The Italian Food Company. Since 1877.

A

The Double Pyramid for Adults, 5th Edition



B

Menu composition and estimated environmental impacts

DAILY MENUS

	Breakfast	Mid-morning snack	Lunch	Snack	Dinner	Nutrition Facts
VEGAN MENU	Soy milk (200ml) 4 cookies (36 gr)	1 portion of fruit (150gr)	Beans (200gr) and pasta (80gr) soup Mixed green salad (200 gr) Oil (20gr) 1 portion of fruit (150 gr)	Unsalted crackers (40gr)	Vegetable soup (300gr) with rice (30gr) Humus (60gr) Whole Wheat bread (75gr)	**Kcal** 2023 **Carbohydrates** 57% **Proteins** 14% **Fats** 29%
VEGETARIAN MENU	1 portion of fruit (150gr) 4 rusks (36gr)	Low-fat yogurt (125gr) 1 portion of fruit (150gr)	Pasta with fennel (60gr) Squash and leeks quiche (180gr)	Unsalted crackers (40gr)	Creamy vegetable soup (300gr) Green beans (160gr) and potatoes (400gr) with grated cheese (40gr)	**Kcal** 2030 **Carbohydrates** 56% **Proteins** 14% **Fats** 30%
OMNIVORE MENU	Half-skimmed milk (150ml) 4 cookies (36 gr)	1 portion of fruit (150gr)	Cheese pizza (560gr) Oil (10gr) Mixed green salad (200gr)	Low fat yogurt (125gr) 1 portion of fruit (150gr)	Peas(50gr)and pasta(40gr) soup Grilled beef steak (150gr) Whole wheat bread (23 gr)	**Kcal** 2140 **Carbohydrates** 60% **Proteins** 15% **Fats** 25%

ESTIMATED ENVIRONMENTAL IMPACTS

	DAILY IMPACT			WEEKLY IMPACT		
	Carbon Footprint (gCO_2eq)	Water Footprint (liters)	Ecological Footprint (global m^2)	Carbon Footprint (gCO_2eq)	Water Footprint (liters)	Ecological Footprint (global m^2)
7 TIMES VEGAN MENU	1,683.05	1,389.09	13.79	11,781.38	9,723.61	96.52
7 TIMES VEGETARIAN MENU	2,436.18	1,533.26	14.81	17,053.26	10,732.81	103.69
5 TIMES VEGETARIAN MENU 2 TIMES OMNIVORE MENU	3,613.35	2,420.55	21.46	25,293.47	16,943.89	150.22
7 TIMES OMNIVORE MENU	6,556.29	4,638.80	38.08	45,893.99	32,471.57	266.53

Source: adapted from ref. (28)

“Sustainability”?

- The most interesting result emerging from the Double Pyramid Model is the strong correlation between the environmental impact of food and their nutritional characteristics.
- Specifically, it has been demonstrated that the foods whose consumption should be moderated for health reasons are also those that have a greater impact in terms of soil use, water consumption, and CO_2 emission.
- To achieve a sustainable, healthy diet it is essential to eat more plant-based foods and reduce our consumption of meat, animal products, and other foods, like salted snacks and sweets, which offer little in terms of nutritional value.

What we need to achieve

- To identify dietary patterns that provide the many nutrients we need for health, in appropriate amounts, but that are also equitable, affordable and sustainable.

- To produce more food with fewer resources (e.g. land, water, fuel), to feed the growing global population.

- Develop clear messages for consumers.



Key Recommendations for Policy Makers and Educators

- Incorporate both healthy eating and sustainable recommendations into European and national dietary guidelines
- Make it the social norm to choose healthy, sustainable foods
- Provide national guidance on portion sizes for different food groups
- Develop tools to enable people to become aware of their personal eco-footprint from food
- Use social media to inform and educate on sustainable food choices
- Provide tools to help consumers make practical changes such as menu and recipe ideas
- Work with grocery stores to enable people to make healthy, sustainable choices at the point of purchase

Thank you for listening.

